Feedback reference
F3235719
Submitted on
09 April 2022
Submitted by
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User type
Company/business
Organisation
Bundesverband der Düngermischer e.V.
Organisation size
Micro (1 to 9 employees)
Country of origin
Germany
Initiative
Nutrients – action plan for better management

Better nutrient management with the aim of reducing nutrient losses focuses on the efficient use of mineral fertilizers. In principle, these have a comparatively high level of efficiency, but there are still possibilities for optimization, for example by adding nitrification and urease inhibitors to mineral nitrogen fertilizers. Likewise, other nutrients can improve the utilization of nitrogen and phosphorus by creating synergies in nutrient uptake by the crop or by eliminating antagonisms. For example, potassium helps to increase the uptake of nitrate by the plant, while magnesium promotes root growth and thus the utilization of phosphorus. Similar processes occur in the area of trace nutrients. Fertilizers are increasingly and predominantly mixed with other components in decentralized systems in order to produce the effects mentioned and, at the same time, to specify the supply of nutrients tailored to the needs of the soil and plants.

Feedback reference
F3247479
Submitted on
20 April 2022
Submitted by
Antonio Mincarini
User type
EU citizen
Country of origin
Israel
Initiative
Nutrients – action plan for better management

the problem of depleting nutrients is a false problem like that of pollution which is deliberately pumped and against which there are many publications against. The reduction of nutrients would serve to put further difficulties: industry, artisans and commerce which are already experiencing a bad season due to Covid and your possible and usual incentives will be of little use as unemployment tends to increase and the many irrelevant streams will disperse

Feedback reference
F3247423
Submitted on
20 April 2022
User type
Company/business
Organisation
SA CHARPENTIER
Organisation size
Small (10 to 49 employees)
Country of origin
France
Initiative
Nutrients – action plan for better management

As an agricultural trader, we are sometimes quite surprised by the feedback, by the lack of knowledge of institutions on the alternative solutions to mineral fertilizers that exist, for which we have convincing feedback on assimilation, the environment, interactions, etc. .

Feedback reference
F3247384
Submitted on
20 April 2022
Submitted by
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User type
Business association
Organisation
Cefic - INCOPA
Organisation size
Medium (50 to 249 employees)
Transparency register number
64879142323-90
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

INCOPA (the Inorganic Coagulants Producers Association, a Sector Group of Cefic) is pleased to provide, in the attached document, its contribution to the call for evidence of the Nutrients' Action Plan for Better Management.

20.04.2022
European Inorganic Coagulants Producers Association
European Inorganic Coagulants Producers Association - INCOPA
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A sector group of Cefic
European Chemical Industry Council - Cefic aisbl
EU Transparency Register: 64879142323-90
INCOPA (Inorganic Coagulants Producers Association) welcomes progress towards integrating EU nutrient policies, with the development of INMAP (Integrated Nutrient Management Action Plan). INCOPA supports the Green Deal objective to reduce nutrient losses by 50% while ensuring that there is no deterioration in soil fertility.
INCOPA notes that the consultation web page refers phosphorus (P) as an essential element for life and an important natural resource. However, that human activities significantly alters natural phosphorous cycle, causing eutrophication, loss of biodiversity in lakes, rivers and seas throughout the EU.
INCOPA also notes that the consultation web page refers about two thirds of the excessive phosphorus levels in waters originate from fertilisers in agriculture while a third comes from industrial and domestic wastewaters.
Phosphorus is especially harmful to EU waters because it causes eutrophication, which is the excessive growth of algae and flora in lakes or other bodies of water. The consequences of eutrophication can be seen in, for example, the Baltic Sea, where toxic algal blooms during the summer of 2018 covered almost the entire Gulf of Finland at their peak.
In order to limit phosphorus losses through wastewater, discharged limit values of phosphorus in the current under revision Urban Waste Water Directive are not strict enough, as the European Environmental Agency report on the state of European waters illustrates. Much better results could be achieved with existing phosphorus removal technologies from waste water and without increasing the cost of treatment. Only political will is needed for setting a new standard for water

cleanliness in Europe.
The more phosphorus that can be captured from the wastewaters, the more can be recycled. Together with more efficient wastewater treatment in general, this would contribute to the EU's circular economy goals. Phosphorus is listed as one of the 23 critical raw materials that are mostly imported into Europe; increasing recovery from wastewater would limit the need for these imports. In addition, the residual sludge from wastewater treatment can and should be used in the production of biogas.
INCOPA notes that the Commission document indicates the overall environmental costs of nitrogen pollution at 70 – 320 billion €/year, but that in fact this covers only nitrogen. An estimate of costs of phosphorus losses is needed.
INMAP should fix the overall objective to move away from EU import dependency for the CRM 'Phosphate Rock' , and to define and implement regulatory, fiscal and other policy actions to achieve this.
More information on phosphorus recovery with coagulants can be found at in our LCA analysis of different WWTP processes (incopa.org).

For more information please contact:
Peng Paternostre, Sector Group Manager, INCOPA,
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About INCOPA
INCOPA is the European Inorganic Coagulants Producers Association. It represents more than 30 producers, more than 80 production sites in Europe, which are accounting for 85% of the European coagulants production capacity.

Feedback reference
F3244003
Submitted on
14 April 2022
Submitted by
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Business association
Organisation
Cefic - Fertilisers Efficiency Enhancers
Organisation size
Medium (50 to 249 employees)
Transparency register number
64879142323-90
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

Fertilisers Efficiency Enhancers, a Sector Group of Cefic, appreciates the opportunity to contribute to the consultation on a Nutrients' action plan for better management. Please refer to the documents attached for detailed information about urease and nitrification inhibitors and their contribution towards the achievement of the ambitions of the Action Plan and the green Deal in general.

April 2022
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Urease and Nitrification Inhibitor technologies contribute to the European Green Deal
Fertilisers Efficiency Enhancers, a CEFIC Sector Group, is ready to contribute to achieving the ambitions
of the European Green Deal and the Common Agricultural Policy (CAP) national strategic plans to reflect the European Union climate neutrality goals. Ensuring these strategic plans are assessed according to robust climate and environmental criteria will support the deep transformation of the European Model of Agriculture.
Fertilisers Efficiency Enhancers is well positioned to offer innovative solutions addressing the challenges highlighted in initiatives such as the Farm to Fork and Biodiversity strategies, as well as the
Nutrient's action plan for better management which outline roadmaps for the transition towards a sustainable food system, a healthy living environment and the protection of healthy ecosystems. By increasing nitrogen use efficiency, our technologies - Urease Inhibitors (UIs) and Nitrification Inhibitors
(NIs) - play an important role in achieving these goals.
Moreover, with a raising demand for food and a reduction of arable land per capita, it is a challenge for farmers to boost yields.
UIs and NIs benefit both the environment and farmers by offering valuable solutions for sustainable and effective nutrient management by significantly reducing GHG and ammonia emissions, and nitrate
leaching from nitrogen fertilisation.
UIs are a proven technology applied to urea for over 25 years in more than 130 countries1. For their contribution to meeting ammonia (NH3) reduction targets2, UIs are considered mandatory or best

practice recommendations in countries including Germany3, Denmark4, France5, Poland6 and Ireland7.
UIs help reduce eutrophication, acidification and small particle dust caused by ammonia emissions from urea, which help preserve biodiversity and reduce air quality impairment. Moreover, recent research shows a reduction of direct nitrous oxide (N2O) emissions by UI8.
1 Although in several EU countries these technologies are supported in the framework of national legislation and/voluntary
initiatives, UI and NI use in Europe is still limited compared to other parts of the world, such as in the US. More details are
available in the attached annex.
2 UI also contribute to the achievement of the National Emission Ceiling Directive targets, including ammonia emissions:
https://iopscience.iop.org/article/10.1088/1748-9326/ac16fe/pdf
3 https://www.gesetze-im-internet.de/d_v_2017/D%C3%BCV.pdf
4 https://www.retsinformation.dk/eli/lta/2019/760
5 France has listed NIs among the agricultural practices which are eligible for the Label Bas-Carbone/Méthode Grandes
Cultures to reduce the carbon footprint of agriculture:
https://www.ecologie.gouv.fr/sites/default/files/M%C3%A9thode%20LBC%20Grandes%20cultures.pdf)
6 https://www.cdr.gov.pl/aktualnosci-instytucje/3678-od-1-sierpnia-2021-r-nie-bedzie-mozna-stosowac-mocznika-w-
formie-granulowanej#:~:text=2021%20Ods%C5%82ony%3A%207819-,Od%201%20sierpnia%202021%20r.,dnia%201%20sierpnia%202021%20r
7 https://www.teagasc.ie/media/website/publications/2020/NH3-Ammonia-MACC.pdf
8 https://www.sciencedirect.com/science/article/pii/S0160412019324353

NIs applicable to all urea and ammonium containing fertilisers increase Nitrogen Use Efficiency (NUE)9
by decreasing nitrogen losses from mineral and organic fertilisers and therefore contributing to reducing their use. The application of NIs reduces nitrous oxide emissions and nitrate (NO3) leaching which results in better water quality and less eutrophication10.
Both UIs and NIs mitigate nitrogen (N) losses whether from gaseous emissions (NH3 and N2O) or nitrate
leaching. While improving NUE, crop yields can either be improved or current yield levels are achieved
with less nitrogen fertiliser. A higher NUE means less nitrogen is required for food production which supports the overall Farm to Fork objective of tackling excess nutrients in the environment11. Since revenues from higher yields typically outperform costs of inhibitor technology, the improvement of NUE contributes to a higher return on investment for farmers and a lower carbon footprint of crop and food production at once.
Fertilisers Efficiency Enhancers is ready to help European farmers grasp the opportunities arising from
the transition to a climate-neutral agriculture, and to contribute to the development of a policy framework to meet EU's ambitious climate and environmental targets.
Clear legislative measures and farmers' access to science-based information on the environmental benefits of UIs and NIs should be coupled with free and open access to flexible solutions to meet farmer
and consumer needs. While we do not believe a mandate to be the most effective solution to promote wider use of EU registered UIs and NIs, we recognise the urgency by which the European Green Deal wishes to drive progress and we are confident that a wider endorsement and adoption of UIs and NIs use (i.e. as an eco-scheme option under the new CAP) would create significant added value in line with
the EU climate and environmental ambitions12.
9 The amount of applied nitrogen that is absorbed and used by the plant.

10 NI are recognized both as a nitrogen mitigation technology and as a technological GHG emission mitigation option in the
JRC Technical Report “Modelling environmental and climate ambition in the agricultural sector with the CAPRI model”.
11 “The Commission will act to reduce nutrient losses by at least 50%, while ensuring that there is no deterioration in soil
fertility.
This will reduce the use of fertilisers by at least 20% by 2030”
(https://ec.europa.eu/food/sites/food/files/safety/docs/f2f_action-plan_2020_strategy-info_en.pdf).
12 The Court of Auditors Special Report 16/2021 “Common Agricultural Policy and Climate” highlights the need for the CAP
to support practices such as the use of NI in other to achieve climate mitigation targets.

Urease and Nitrification Inhibitors: contributing to reduce nitrogen losses from fertilisers
➢ Mode of action
The use of nitrogen is essential for agricultural production but only about 50% of nitrogen applied through fertilisers is absorbed by plants. Nitrogen fertiliser comprises either urea, ammonium or nitrate and their mixtures. Urea nitrogen is not readily plant available and must undergo hydrolysis via the naturally occurring urease enzyme to ammonium (NH_4). Hydrolysis occurs when urea is applied to
the soil surface leading to regular losses of 10-30% of ammonia to the atmosphere through ammonia volatilization (Figure 1).
Figure 1
To slow down the hydrolysis of urea, urease inhibitors (UIs) can be applied thereby reducing ammonia
emissions by close to 70% (Bittman et al. 2014). As a result, less nitrogen is released into the environment and this nutrient remains available for growing crops. While ammonium nitrogen (NH_4^+)
is effectively retained by the soil and resistant to loss, naturally occurring soil bacteria convert it to nitrate (NO_3^-) and release nitrous oxide (N_2O) through nitrification. Nitrous oxide is a very potent greenhouse gas (29813x CO_2) with an atmospheric lifetime of over 100 years.
Nitrate can be reduced to nitrous oxide (N_2O) and nitrogen gas (N_2) through denitrification. In addition,
nitrate is very mobile and can easily leach into ground and surface water, resulting in eutrophication - the formation of toxic algal blooms and the loss of biodiversity. One of the solutions to minimize nitrogen losses is the use of nitrification inhibitors (NIs), which specifically inhibit the activity of microorganisms in the soil responsible for the conversion of ammonium to nitrate. Consequently,
13 Understanding Global Warming Potentials | Greenhouse Gas (GHG) Emissions | US EPA

nitrous oxide emissions and nitrate leaching are reduced leading to ammonium being available to plants longer and in a form that best suits their needs.
➢ Potential impact on emissions of ammonia, CO_2 equivalents and nitrate leaching
In the EU27 + UK, urea fertiliser makes up 22% of the commercial nitrogen consumed in forage and crop production. Readily available, it is an attractive fertiliser for farmers due to its high N content, low cost and good water solubility. Nevertheless, ammonia volatilisation potential after field application represents a challenge to the use of urea. Furthermore, ammonia can be transported over long distances causing eutrophication and acidification in non-agricultural areas, e.g. rain forests. This can be mitigated to a large extent via urease inhibitor usage, as urea treated with UIs can contribute to a 42.5% and 9%14 reduction of ammonia emissions and nitrous oxide emissions from mineral fertilisers, respectively (Table 1).
On the other hand, NIs applied to urea and ammonium containing fertilisers like ammonium nitrate, calcium ammonium nitrate, ammonium sulphate and NPK compounds reduce nitrous oxide emissions and nitrate leaching. Research shows using urease and NIs with urea and ammonium containing fertilisers can mitigate nitrous oxide emissions by 47%15, leading to significant carbon abatement of

crop production systems. Taking into account the effect of saving nitrogen losses of about 619 kT nitrogen and average CO2eq emissions of 3.5 t per ton of fertilisers nitrogen produced in Europe the overall potential impact of inhibitor technology on emissions from nitrogen fertilisers sums up to about
32 million tons of CO2 equivalents or about 33% reduction of the carbon footprint of current nitrogen fertiliser use.
14 IFA data – average 2015-18 EU 27+UK and EMEP/EEA air pollution emission inventory guidebook 2019
15 IFA data – average 2015-18 EU 27+UK and EMEP/EEA air pollution emission inventory guidebook 2019
5
➢ UI and NI usage outlook
Today, Fertilisers Efficiency Enhancers estimates urease inhibitor use in the EU27 + UK is around 15%
of available urea fertiliser, while use of NIs is less than 5% of available urea or ammonium-based fertiliser. These figures lag behind some regions of the world, such as the U.S., where inhibitors are used much more frequently by growers. Relatively low use of UIs and NIs in the EU27 + UK may be driven by either farmers not fully recognising the benefits of using inhibitors or by farmers recognising
a loss of nitrogen which is just below the economic threshold to justify the purchase of inhibitors. In fact, the cost of either producing more crop with the same nitrogen fertiliser application or increasing crop yield with the same amount of nitrogen fertiliser is slightly below the cost of the inhibitor. Nevertheless, this merely economic analysis fails to consider the environmental benefits of the reduction of nitrogen losses and a more sustainable and effective nutrients management which could be enhanced using UIs and NIs.
➢ Compliance to EU legislation
In the EU, all registered UIs and NIs fulfil the requirements of REACH16 and the EU Fertiliser Regulation17, ensuring that their handling, storage and use do not pose unreasonable risks to users or the environment when used in accordance with labelling and approved uses.
About Fertilisers Efficiency Enhancers:
Fertilisers Efficiency Enhancers is a Sector Group of Cefic, the European Chemical Industry Council. We
represent the value chain of nitrogen stabilisers and other fertiliser enhancers in Europe and promote the agronomic and environmental benefits of nutrient enhancers in fertiliser applications.
Membership: BASF, InVivo Bioline, Compo Expert GmbH, EuroChem Group AG, Koch Agronomic Services and Solvay.
16 Regulation (EU) 1907/2006/EC
17 Regulation (EU) 2003/2003/EC

Feedback reference
F3246641
Submitted on
19 April 2022
Submitted by
Johanna Jacomina Heymans
User type
Academic/research Institution
Organisation
European Marine Board Secretariat
Organisation size
Micro (1 to 9 employees)
Transparency register number
571994418695-46
Country of origin
United Kingdom
Initiative
Nutrients – action plan for better management

The European Marine Board (EMB) Secretariat supports the European Commission's Nutrient Action Plan for Better Management to help reduce nutrients by at least 50% and hope that it will complement the Zero Pollution Action Plan. The problem statement highlights the importance of an integrated approach on nutrient pollution including air, water, soil and climate. We believe that the marine environment should also be included in this approach, as highlighted in modelling studies last year: Friedland et al. [1] used hydrological and hydrodynamic-biogeochemical models to show that improved management of agriculture and river wastewater treatments helped to reduce marine eutrophication in nearly all European marine regions. However, Piroddi et al. [2] used an ensemble of higher trophic level models from across Europe to show that the proposed technically feasible nutrient reduction to surface waters under the Water Framework Directive did not have the desired positive effects on the structure and function of marine ecosystems. In fact, the only significantly positive effects that were found were in the Baltic Sea, which was the most impacted by eutrophication. Piroddi et al. [2] found that the nutrient reductions proposed by the European directives will not have the required impact on the higher trophic levels of most European marine ecosystems. The impact of nutrient pollution as an co-occurring pressure should be taken into account through proper cumulative pressure assessments as is asked for in the EMB's Navigating the Future V. The only way to achieve zero nutrient pollution is to find ways to recycle nutrients, rather than finding new ways to mine them. The scarcity of phosphorus, highlighted by including phosphorus in the critical raw materials list, creates environmental problems across the world. In the USA the mining of phosphate on land has been petitioned by the Center for Biological Diversity. Phosphate mining has also been proposed off the coast of Namibia, although the ecological impact of this mining is not clear. It is important to make phosphate (and nitrogen) recycling more financially and environmentally viable. It is not clear if the mentioned cost-benefit analysis for nitrogen takes into account the reduction in fisheries that is inevitable from more eutrophic marine ecosystems, but it is unlikely as there are not many good marine ecosystem service assessments – see the EMB Future Science Brief on Valuing Marine Ecosystem Services. This influx of nutrients entering marine waters also results in the proliferation of specific microalgae, which might not be the preferred food for fish and other species eaten by humans, and might change the dynamics in the food web, which can ultimately impact fish

catches and food availability [3], and lead to eutrophication, hypoxia and anoxia [4]. Finally, it is important for Europe to lead by example and ensure that the cross-border nature of nutrient pollution also includes the global nature of the nutrient cycles. The EU cannot only look at the transboundary water issues of the European Seas, but must take into account its purchasing power to export the problem to less developed countries such as Namibia.
References: 1. Friedland, R., et al., Effects of Nutrient Management Scenarios on Marine Eutrophication Indicators: A Pan-European, Multi-Model Assessment in Support of the Marine Strategy Framework Directive. Frontiers in Mar. Sci., 2021. 8(116). 2. Piroddi, C., et al., Effects of Nutrient Management Scenarios on Marine Food Webs: A Pan-European Assessment in Support of the Marine Strategy Framework Directive. Frontiers in Mar. Sci., 2021. 8(179). 3. Landrigan, P. J., et al., Human Health and Ocean Pollution. Annals of Global Health, 2020. 86(1). 4. Diaz, R.J. Overview of hypoxia around the world. J. env. qual., 2001. 30(2): 275-281.

Feedback reference
F3243468
Submitted on
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Submitted by
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Initiative
Nutrients – action plan for better management

The EU took an important step towards circularity by setting the obligation of its member states to separately collect biowaste or recycle it at source by the end of 2023 on. However, to create a paradigm shift and make nutrient recycling a reality in Europe, a complementary set of actions including the following will be necessary: 1) Ensure that compost and digestate from biowaste comprising food / catering waste can be used to produce fertilizer products with CE-mark or possibility of commercialization in the national markets as products; 2) Foster the development of markets for compost and digestate from biowaste, and the creation of privileged conditions for products meeting high quality standards; 3) Legislate towards allowing the direct application of liquid digestate in the fields; 4) Support the implementation of novel technologies promoting nutrient recycling (eg. struvite production) by providing incentives for its adoption and/or financing the CAPEX and OPEX surplus versus the standard nutrient production methods.

Feedback reference
F3243432
Submitted on
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User type
Company/business
Organisation
Dumipro
Organisation size
Medium (50 to 249 employees)
Country of origin
Netherlands
Initiative
Nutrients – action plan for better management

Dumipro Producers of Sustainable Minerals, that is the entrepreneurs we represent! A young, ambitious interest group founded in 2018 because the need existed to the interests of this specific group to better serve entrepreneurs. The sustainable mineral production has the latter an enormous development in the Netherlands in ten years and an important position in the nutrient chain acquired which makes it targeted advocacy for this group entrepreneurs has become necessary. We Realize that we need important support can and must deliver on the quality of our living environment. Where it concerns one clean air, clean water and a healthy environment environment it is important to contribute contribute to the nutrient discussion at local level and international level. The starting point of DumiPro is one professional sector that takes care of it reuse of nutrients and organic substances to contribute to the objectives of the Netherlands in this area of sustainability, environment and the circular economy economy. The bundling of volume, knowledge and experience makes DumiPro a fully-fledged one discussion partner for the authorities area of a mature policy, and it use of fertilizers. We like to work from a professional starting point with organizations and governments. In the nutrient chain are different factors such as transporting, trading, mediating, contractors, and the processing companies. We represent the bigger one processing companies in the nutrient chain, which contains the nutrients recovery and conversion into products. This products range from high-quality compost types to recovered mineral raw materials for industry. Mission We are reliable and valuable to our customers additional link in the nutrient cycle. We bundle and share knowledge and expertise at national and international level expertise and use it to achieve climate goals and a promote circular economy. All organic fertilizers being exported must have been processed. This includes the modernizing policies[1] not only domestically but also at foreign level. We believe that in the EU the Member States should also work together better, and that nutrient pollution must be tackled at the source. More use should also be made of targeted application techniques and sustainable agricultural practices, in particular in the concentration areas. We hereby endorse the Farm2Fork[2] EU strategy. DumiPro strives to... the available nutrient flow from livestock farming by 2030 100% convertible into high-quality end products with the same status as fertilizer. Smarter and more effective The agricultural sector has become efficient in recent decades produced, and we want to continue doing so. However, it is the soil has become depleted and the air and water have been affected. To to make food production for the world's population ecological responsible, we must be more economical available nutrients and make more effective use of them scaling up techniques and workable processes. This is alone possible with good cooperation between all parties, livestock farmers, arable farmers, citizens, scientists and politicians must work together in word and deed. Only this way we can prevent the scarcity of raw materials we waste less biomass and precious nutrients. The DumiPro entrepreneurs are prepared to innovate far-reaching, future legislation and regulations should provide more room for this innovations and their application.

Feedback reference
F3243433
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13 April 2022
User type
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Organisation size
Medium (50 to 249 employees)
Country of origin
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Initiative
Nutrients – action plan for better management

Dumipro. Urgency
It is important that people see the urgency in tackling this problems. If this does not happen, biodiversity will suffer soil conditions will only come under more pressure and the quality of life declines. It is up to the sector to create a transition to give. We would like to set GOALS together with policy makers to achieve this, so that no MEANS are prescribed that room for innovation and the application of new technologies is unnecessary to limit. As processing companies, we help provide the solution for the nitrogen problem, because we recover and capture nitrogen in products that can be used usefully. We can do this do at home and abroad. Nitrogen Nitrogen is a valuable product. Our efforts are focused on it reducing nitrogen emissions in the nutrient cycle. In June 2020 The Remkes Commission came up with the second report “Not everything is possible everywhere” in which much has been written about this subject. This is possible through innovation significant environmental benefits can be achieved. Due to the available process nutrient flow from livestock farming 100%, we agree to the Remkes Committee in which the advice is given to to phase out the spreading of unprocessed manure on the land by 2030. Agriculture in recent decades has been explicitly focused on efficiency production has had a major impact on nature and the environment. The soil has become increasingly depleted, partly due to the use of fertilizer. Air, soil and water are affected. Around the to make food production for the world's population ecologically sustainable, we must use the soil, available nutrients and more sparingly make more effective use of common proven and workable processes upgrade. Recovering nutrients is only possible with a good one cooperation and communication between all links. Only on this one way we can prevent the scarcity of raw materials we waste less biomass and nutrients. Policy review The government is busy renewing the nutrient policy for the sector, this is a sensitive topic in politics and society. DumiPro wants a good quality one workable regulations at European, national and provincial level. DumiPro thinks so It is important that the nutrients can be actively recovered from the available ones residual flows. Being able to buy off a processing obligation is therefore not correct. Therefore DumiPro advises to place a complete partition between poultry and the other sectors, as NCM also advises in its June 2020 report.[3] The connected entrepreneurs at DumiPro are prepared to go far in innovation and technology, the government should ensure that there is more support for this and that innovation is also stimulated and facilitated. The cheapest solution for the government to do this is to to speed up and better enforce long-winded procedures, this can be done without opening up of additional subsidies. DumiPro's affiliates can only provide the give substance to national and international climate and environmental ambitions where applicable clear, robust and consistent legislation and regulations. No emissions The recovery of nutrients and the production of renewable raw materials is possible without excessive emissions to the air, soil and water. The emissions of substances in the nutrient process of collection, storage, processing, processing, delivery and use can be done without hazardous emissions soil, water and air. To be here in a sustainable, affordable and professional way To indicate content wisely, scale

is required. This applies to both emissions of nitrogen and CO2, but also other greenhouse gases. This carries contributes to a better healthy living environment

Feedback reference
F3243142
Submitted on
13 April 2022
Submitted by
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Cefic - ASPE
Organisation size
Medium (50 to 249 employees)
Transparency register number
64879142323-90
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

Ammonium Sulphate Producers Europe (ASPE), a sector group of Cefic, welcomes the opportunity to contribute to the consultation on the Nutrients' action plan for better management. ASPE input can be found in the attached document.

13 April 2022
ASPE – Ammonium Sulphate Producers Europe
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Capro-grade Ammonium Sulphate: contributing to
the ambitions of the European Green Deal
The European Green Deal and its Strategies, the Nutrients' action plan for better management and the Circular Economy Action plan, have outlined ambitious goals to overcome global challenges such as climate change. Ammonium Sulphate Producers Europe (ASPE), a sector group of Cefic, strives to meet these targets, and as such, calls for a level playing field to facilitate the process.
Capro-grade Ammonium Sulphate (AS) can contribute to meeting the ambitions set out in the framework of the European Green Deal, the Nutrients' action plan for better management, the Farm to Fork and the Biodiversity Strategies, as well as by the new Circular Economy Action Plan. For an enhanced contribution of capro-grade AS towards achieving these targets, ASPE members highlight the need for an effective quality control on imported articles to enable a level playing field for European manufacturers, as well as higher quality and safety standards throughout the fertilisers value chain from their production to consumers.
Capro grade AS is a crystallised mineral fertiliser, a by-product issued from the production of caprolactam, and an organic compound used to manufacture polyamide 6, fibers and plastics.
Capro-grade AS production process
As a by-product, capro-grade AS is a sustainable and circular product enabling an efficient use of resources, waste reduction and lower emissions1.
1 As a by-product, capro-grade AS is issued by the production of caprolactam and its production does not engender
additional use of resources nor its manufacturing leads to additional emissions.
2
Next to the circularity of capro-grade AS which, as a by-product is by essence upgraded into a major fertilising product which enables energy and resource efficiency, it should be noted that capro-grade

AS has a strong sustainability profile and low product carbon footprint (PCF) due to the reduced greenhouse gas (GHG) emissions associated to both its production and application.
Carpro grade AS offers a sustainable solution towards efficient crop nutrition:

- Capro-grade AS contains two essential plant nutrients in high concentrations: Nitrogen in ammonium form - which is fixed to soil particles and cannot leach, and Sulphur in the sulphate form - which is directly available to plants. This enables farmers to apply two key nutrients using one single fertiliser, allowing savings in terms of time and energy for spreading the fertilisers. Capro-grade AS is therefore not only a cost effective, but also a sustainable solution which helps reducing the CO2-footprint of fertiliser application.
- Capro-grade AS meets the highest purity standards (>99% purity), has a very low water content, a higher pH compared to other AS sources and fulfills all the requirements set by the new EU Fertilising Products Regulation (EU) 2019/1009, including low heavy metal content. Capro-grade AS hardness represents an additional significant operational advantage as it allows standard spreading width of 36-40 meters and beyond in some areas. Its higher hardness also allows to store it safely and minimises its losses during logistics and storage.

Capro-grade AS can play an important role also in achieving the objectives of the Farm to Fork Strategy thanks to its safety and full traceability throughout the value chain.
For an enhanced contribution of capro-grade AS towards achieving these targets, ASPE members highlight the need for an effective quality control on imported articles to enable a level playing field for European manufacturers, as well as higher quality and safety standards throughout the fertilisers value chain from their production to consumers.
For more information please contact:
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About ASPE
Ammonium Sulphate Producers Europe is a sector group of Cefic, the European Chemical Industry Council and its members represent over 70% of the capro-grade ammonium sulphate produced in Europe. ASPE membership comprises BASF, DOMO, Fibrant and Lanxess.

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Academic/research Institution
Organisation
RWTH Aachen University
Organisation size
Large (250 or more)
Country of origin
Germany
Initiative
Nutrients – action plan for better management

Nutrient-Recycling is inevitably for a sustainable nutrient management. There are already several technologies which are able to solve the problems. Also lots of new technologies and measurements are developed constantly in the EU and in the world. My feeling is, that sometimes it is not technologies, which are missing, but holistic strategies that have to be encouraged. One amazing example is the new sewage sludge ordinance in Germany and the approaches to fit this regulation and to recover phosphorus from sewage. Several technologies are on the market, which aim to treat the existing waste streams. The result is, that the technologies are expensive and not as ecological as possible. There would be a great opportunity to produce cleaner waste streams by identifying problematic substances in the process before and by this reducing the expense of recycling. This can only be achieved by support with governmental funding or new regulations. The market will not be able to solve this, because the developers of technologies cannot expect the users to adjust themselves to the technologies. Please find combinations of operators and companies, who are willing to work on the process-chain instead of only technologies. Reduce the contaminations of "precious" waste streams beforehand to simplify the recovery.

Feedback reference
F3239313
Submitted on
11 April 2022
Submitted by
Zoltán HAJDU
User type
Company/business
Organisation
SOLTUB Ltd.
Organisation size
Micro (1 to 9 employees)
Country of origin
Hungary
Initiative
Nutrients – action plan for better management

Closing the nutrient cycles as N and P in agriculture is a general requirement in the EU member states (MS) practices and several technologies are available in the plant cropping sector as intercropping, applying cach crops, agro-forestry, crop residue management, crop fertilisation practices e.g. application of processed or unprocessed manure, application of N inhibitors and others. There are differences between the EU MS in the amount of organic fertilisers applied on the fields, as there are regions with nutrient excess e.g. Flanders, The Netherlands and nutrent deficit regions e.g Hungary, Slovakia, Romania. Therefore is necessary the : - mapping of the nutrient deficit and excess zones, (identifying the nutrient hotspots zones) - applying differentiated nutrient management technologies for the nutreint deficit and excess zones, e.g reducing the animals heads in the nutrient excess zones and increasing the head of animals in the deficit zones, - revising the N directive ceiling of 170 kg N/ha as is a need for a balance nutrient Europe/balanced nutrient regions, Regional maps are required showing the type and quality of available manure. - reduce the chemical fertilzers use e,g, incresing manufacturing/energy prices , instead enhance the animal number and introduce innovative technologies to reduce GHG emisssion in the animal sector, - improve the application of potential organic sourced fertilizers from the industry e.g. food industry and other processing industries, - sharing best practices in nutrient management and nutrient cycling between regions including the cross-borders regions cooperations, Other actions having an idirect impact on the nutrient cycling: - including the agricultural crop production in the carbon sink management, not only LULUCf and forestry, - changing the EU subsidy system from the area payment to farm level carbon balance accounting payment, - revising the 1069/2009 EC on the internatinal manure sources products trade by avoiding the risk of microbial and micro-elements threath as in many cases the national standards are higher than the EU standards, - assessing food products PEF and setting the targets in reducing the GHG emission in the whole food production chain inclusing crop production and animal husbandry,

Feedback reference
F3241974
Submitted on
12 April 2022
Submitted by
Elodie MARDINE
User type
EU citizen
Country of origin
France
Initiative
Nutrients – action plan for better management

The closing of the nitrogen and phosphorus cycles is a favorable situation for a number of issues clearly identified in the accompanying sheet for this consultation. Working more in a mid-mountain cattle breeding sector, I am particularly confronted with these difficulties for the following issues: - enrichment and degradation of the quality of environments: meadows with over-fertilization leading to a trivialization of the flora and a loss of associated services such as resources for pollinators; aquatic with a loss of quality and biodiversity of natural lakes, wetlands, watercourses; soils with nutrient saturation and an impact on biodiversity, soil resistance and resilience and their functionality. These environmental degradations, to which can be added the degradation of air quality and the impact on climate change, lead, in line with the One Health logic, to impacts on overall human health. - autonomy of farms which often purchase fertilizers or amendments complementary to the effluent produced on their farms and which make it possible to meet nutrient needs when the size of the farms remains reasonable and adapted to the livestock. this dependence causes great difficulties when the supply or prices of fertilizers soar as expected. An action plan on a European scale which promotes balanced management of agricultural plots with respect for the needs of crops (including meadows), the encouragement of plain/mountain type exchanges for example to exchange straw (for animal housing) against organic effluents (to fertilize) or even the diversification of territories or even agricultural operations to the extent possible rather than the model inherited from "cereal production sectors" and "intensive livestock sectors" which would contribute to the previous point (exchanges) would make it possible to respond to these issues. In my opinion, it will be a question of proposing measures for the territories where these issues are the most significant but we should not forget the territories, such as those in mid-mountains, where these issues seem less marked but where the fragility of the environments leads to equally marked and disastrous consequences.

Feedback reference
F3046329
Submitted on
07 April 2022
User type
EU citizen
Country of origin
Germany
Initiative
Nutrients – action plan for better management

Regarding N- and P-Emissions to ground- and surface waters, member states have to pay more money, day after day they fail achieving the targets. Regarding minimizing input of pesticides: member states have to pay more money day by day they fail of not reducing the use of pesticides significantly. Targets must be more demanding. Compulsory indicators must be corresponding to the targets, for example N-Balance surplus, or the mineralized N in soil in autumn, before leaching period is starting. They have to be defined and controlled and if necessary adapting after short period of monitoring phase (2 years). Pick the low hanging fruits, which are easy to fulfill, easy to control and cheap and make them compulsory:: Release a ban on the turn-over of permanent grassland, and on grassland, which is used as grassland for more than 2 years. Reduce the percentage of maize, potatoes, sugar beats in crop rotation to max. 30 % and make it compulsory to have maize with undersown grass or sommeroats. Make it compulsory to have catch crops in winter and a ban on ploughing in autumn before sowing catch crops. Reduce the amount of N- Nertilizer, which is recommended by the member states for all crops in each country by 20 percent all over. Establish buffer zones around nature conservation areas. (Protection of the protection zone), otherwhile biodiversity targets cannot be reached. Make a regular monitoring of all substances of pesticides in shallow groundwater under agricultural use compulsary. Release a new target for the total concentration of all metabolites in ground- and drinkingwater.

abstract: Intensive animal production, vast amounts of biogas plants, and the spreading of manure and digestates, exerts strong pressure on water quality in the German federal state of Lower Saxony. Catch and cover crop (c&c) cultivation is seen as one measure to inhibit nitrate leaching into soils, and to prevent water pollution with nitrates. A document analysis was carried out, covering the time span of 1992 to 2020, and the findings were combined with available quantitative data of the same period, and with GIS analysis. From 1994 to the year 2020, the acreage of subsidized c&cs increased from ca. 10,000 ha to ca. 380,000 ha. In addition, there was an acreage of unsubsidized c&cs
of about 100,000 ha declining to 50,000 ha. In comparison, the acreage of arable land remained at approximately 1,880,000 ha. We found that c&cs did not contribute substantially to water protection for the following reasons: the design of the measure, control of farmer’s actions, and the antagonistic trend due to the increase in animal numbers and biogas plants. The development of c&cs over time and space reveals that frame conditions and management requirements of cultivating c&cs need to be well designed to be effective and efficient (with regard to N reduction and reduction of costs). It is vital to coordinate all programs and schemes in one region. From our evaluation, we conclude that a measure such as c&c cultivation, which is simple to introduce and easy to control, should be implemented over winter as a mandatory measure in order to achieve a greater uptake. Additionally, result-based measures could complement this scheme, as there is a strong link between subsidy level and the success of the measure

Feedback reference
F3049031
Submitted on
07 April 2022
Submitted by
hans-jürgen ulonska
User type
EU citizen
Country of origin
Germany
Initiative
Nutrients – action plan for better management
Ladies and Gentlemen I had already tried to send my feedback and perhaps pressed a button that wasn't applicable a little prematurely (instead of sending). The whole thing is due to my age. Unfortunately, I wasn't able to save my template, but I hope that my original statement of opinion reached you safely by email. I apologize for my clumsiness, I am available to answer any questions if necessary and remain Best regards Dr. Hans-Jürgen Ulonska

Feedback reference
F3038468
Submitted on
06 April 2022
User type
EU citizen
Country of origin
Germany
Initiative
Nutrients – action plan for better management

Please support diverse organic farming according to Demeter guidelines. Ensure that monocultures of rapeseed and corn, which are used for energy production, disappear and healthy food is grown.

Feedback reference
F2962147
Submitted on
01 April 2022
User type
Academic/research Institution
Organisation
University
Organisation size
Large (250 or more)
Country of origin
France
Initiative
Nutrients – action plan for better management

Integrated Agriculture (IF) and aquaculture (IMTA) production methods have been thoroughly studied and demonstrated their efficiency to recover and recycle nutrients while increasing and diversifying productions, in sustainable ways, and contributing to food sovereignty and security. Therefore, such production methods, integrating multiple trophic levels, could be key for the farm to fork strategy, the biodiversity strategy, the circular economy action plan and the integrated nutrient management action plan. Incentives for their development could be considered to promote efficient nutrient recovery. Consequently, in order not to increase administrative burden of primary production sectors applying integrated production methods and to promote their development, the integrated nutrient management action plan should be included within the existing policies and legislations regulating land, water and sea primary production and propose incentive actions instead of adding another layer of external legislation.

Feedback reference
F2967266
Submitted on
02 April 2022
Submitted by
A van Loon
User type
Non-governmental organisation (NGO)
Organisation
Meten=Weten
Organisation size
Large (250 or more)
Country of origin
Netherlands
Initiative
Nutrients – action plan for better management

Nutrient use in agriculture is aimed at maximum production without regard to the health of agricultural animals or taking into account emissions to the environment. This causes many problems due to the unacceptable contamination of soil, water and air. Natural ecosystems demonstrably suffer from this (see also nitrogen directive, habitat directive and water directive framework). The quality of the delivered products is also negatively affected. Lots of water and unusable substances and less healthy, easily digestible products. The use of nutrients in agriculture must be subject to strict rules to prevent polluting the environment or reducing the intrinsic quality of products. The currently permitted quantities are clearly too high to achieve these goals. In the long term, keeping water, soil and air healthy is much more important for people and the environment than maximum production without regard to the long-term consequences.

Feedback reference
F2955760
Submitted on
30 March 2022
Submitted by
Horst MULLER
User type
Company/business
Organisation
Mueller Abfallprojekte GmbH
Organisation size
Small (10 to 49 employees)
Country of origin
Austria
Initiative
Nutrients – action plan for better management

Pure nature knows no waste! There are just cycles for closing loops and valuable substances within the "biological cycle" are not wasted. During industrialization a "technical cyle" was established which affects the "biological cycle" by its emissions. Investigations during the last decades focussed mainly on pollutants in "sustainable fertilizers" like compost and sewage sludge to find out that they are contaminated and land application could be a risk for the environment. Purity rules like legal frameworks for soil protection or compost/sewage sludge use and marketing driven regulations, set up by retailers or agricultural production schemes, are responsible for bans of "sustainable fertilizers" and gaps in nutrient management. To fulfill circular economy goals it will be necessary to detect the emission-sources inside the "technical cycle" and to protect the "biological cycle" from contamination. Thirty years ago heavy metals have been the main problem in sewage sludge and compost. Regulations like REACH or the "Austrian indirect distributer ordinance" and the "Austrian ordinance for collecting biowaste separately" have shown the efficiency of measurements at the sources of contamination. Nowadays the heavy metal concentrations in compost and sewage sludge are nearly at the same level like soil. Nevertheless there are more and more restrictions to use compost and sewage sludge as local ressources for organic matter and nutrients by direct land application. The approach for the revision of the urban wastewater directive, to detect contamination at the sources to provide clean sludge for the agriculture is a big step forward for better nutrient management. Intensive work actually done in standardization in CEN and CENELEC "Circular Economy Topic Group" (https://www.cencenelec.eu/areas-of-work/cen-cenelec-topics/environment-and-sustainability/environment/) will create new CE-principles to be integrated in future standards. Very good advice is given in the RISE-report on Nutrient Recovery and Reuse in European agriculture: (https://risefoundation.eu/nutrient-recovery-and-reuse-nrr-in-european-agriculture/) where critical points about nutrient recovery and reuse say i.e. "diversification of nutrient supply thereby reducing reliance on imported phosphate rock and natural gas". The implementation of Circular Economy principles in European regulations are the only chance to improve the nutrient management by realising the full potential of "sustainable fertilizers". Regulations like the draft for a revised ordinance for waste incineration (January 2022) in Austria are an example to reduce the availability of nutrients regionally. The draft intends to incinerate sewage sludge from 2030 with following phosphorous recovery from ashes. Solutions like this are a way to waste energy for water and nitrogen evaporation to the atmopshere, for ash treatment in a chemical plant to recover just phosphorous and for

producing mineral nitrogen fertilizer to substitute the loss by incineration. Organic nitrogen and phosphorus in compost and sewage sludge are valuable resources to enable effective regional nutrient management, based on short transport distances and low energy consumption for treatment and application. Rules for monitoring the quality and the proper management of "sustainable fertilizers" in the revised "urban wastewater directive" and the revised "Sewage sludge directive" will enable higher acceptance and better management of "sustainable fertilizers. More information:
https://www.efar.be/biosolid-landspreading/#BEST-PRACTICES

Feedback reference
F2953825
Submitted on
29 March 2022
Submitted by
Giampaolo Oliviero
User type
Company/business
Organisation
PIXAG SRL
Organisation size
Micro (1 to 9 employees)
Country of origin
Italy
Initiative
Nutrients – action plan for better management

I believe it is essential to bring together environmental actions by functionally connecting them, using models capable of simulating the combined action of agronomic activities, climate, plants and soil it is possible to guide interventions to: - reduce the use of fertilizers without reducing production; - identify the ideal periods for distribution; - measure GHG emissions; - decide which and how much land to remove from cultivation and allocate to reforestation or meadows; - etc. The standard should reward and support the use of these technologies which, together with precision agriculture, allow for real progress in terms of sustainability. Limiting yourself to giving generic prescriptions, just because they are easy to apply and control, cannot lead to the desired results in the required times. Thank you

Feedback reference
F3249879
Submitted on
25 April 2022
Submitted by
Selma Lagouarde
User type
Trade union
Organisation
AFAÏA
Organisation size
Micro (1 to 9 employees)
Country of origin
France
Initiative
Nutrients – action plan for better management

AFAÏA is the professional union of players in the growing media, mulch, organic amendments, organic and organo-mineral fertilizers and biostimulants sector. Representing more than 95 marketers of fertilizer materials and innovative inputs for sustainable plant crops. We thank the Competent Authorities for the willingness to implement an action plan relating to nutrient management. After consulting its members, AFAÏA would like to share its thoughts on its content: We can only support the initiative of the European Commission to develop an action plan for integrated nutrient management. We insist, all the same, on the need to take great care to avoid any deterioration of soil fertility. It is important that action is defined at EU level, and globally in order to reduce levels of pollutants harmful to human health and the environment. The objective of reducing nutrient losses by at least 50% is in line with the principles of the Green Deal for Europe and the Farm to Fork strategy. The reduction of at least 20% in the use of fertilizers, which this implies, must not be to the disadvantage of soil fertility, and should focus primarily on the reduction of fertilizers of non-renewable origin. The action plan must, therefore, contain concrete objectives for developing the use of nutrients of renewable or recycled origin. The use of such nutrients should be subject to financial incentives for farmers. They must be better informed and supported for the optimal use of these products, and helped to acquire the most suitable equipment for reducing losses.

Feedback reference
F3250047
Submitted on
26 April 2022
Submitted by
Hans-Peter König
User type
Academic/research Institution
Organisation
FEhS - Institut für Baustoff-Forschung e.V.
Organisation size
Small (10 to 49 employees)
Country of origin
Germany
Initiative
Nutrients – action plan for better management

FEhS Institute for Building Materials and EUROSLAG appreciate having the opportunity to participate in the consultation. In view of climate change, population growth and the current situation in Eastern Europe, one goal of the initiative must not be lost sight of: the security of supply with food and feed as well as with renewable raw materials. As a result, the reduction of nutrient losses must not lead to a decline in crop yields. The goal must be a sustainable intensification of agricultural production. I.e., to produce more with the same amount of inputs used and thus reduce the losses of not utilised nutrients. Nitrogen and phosphorus are only the environmentally relevant nutrients. To consider only them in isolation would be short-sighted. By optimizing plant nutrition, i.e. adapting nutrient quantities to the yield potential of the site and by matching the nutrient ratio of all macro- and micronutrients as well as lime requirements to the respective crop type and soil, nutrient losses can be minimised without sacrificing yield and endangering soil fertility. Another aspect that must not be ignored in the topic of nutrient management is the security of nutrient supply. Some nutrient deposits are limited and are partly located outside the EU, in some cases in politically difficult regions. This is where by-products and also recycled products play an essential role. By-products such as slags from the steel industry are characterised not only by their lime content, but also by containing other valuable plant nutrients. For example, slags contain significant amounts of micronutrients and in some cases also phosphate, which make a notable contribution to independence from nutrient imports from third countries. A targeted use of these by-products conserves natural resources (no additional lime mining for agricultural application) and saves energy and CO2 in the production of primary fertilisers. A sustainable use of by-products requires a well-considered legal framework that supports the use of these by-products and does not exclude them from participation in the internal market. Regarding slags particularly, there are decades of positive experience in fertilisation and scientific findings that must be considered in future legislation.

Feedback reference
F3250012
Submitted on
25 April 2022
User type
EU citizen
Country of origin
France
Initiative
Nutrients – action plan for better management

As a researcher in agronomy (public research), specialized in soil fertility management, phosphorus (P) in particular, here is my contribution. The formulation of the problem by speaking of "fertilizer" (which suggests "synthetic fertilizer") is imprecise: the majority of the problems come from the poorly controlled use of livestock effluent in areas with a high density of livestock. breeding. Effluents are considered too much as a waste and not as a resource, which leads to their misuse as fertilizer. Controlling nutrient flows concerns all fertilizers, including recycling (effluents). In the long term, the CAP must reconnect livestock farming and crops, de-specialize agricultural regions to facilitate the recycling of effluent, which would otherwise be too costly to transport. For integrated and precise management of N and P and the looping of element flows, it is necessary to control the joint contributions of N and P in effluents and fertilizers from recycling and adjust these contributions according to the least deficient element, following crop needs and nutrient stocks already available in the soil. Then adjust the availability of the most deficient elements with simple fertilizers. The objective of reducing fertilization by 20% (or more) may be legitimate in regions and production systems where fertilizer flows are excessive and subject to transfer to the environment. But this cannot be generalized: conversely, there are also regions and production systems where fertilization must be reinforced to improve the fixation of atmospheric CO2 through photosynthesis. If the production of fertilizer has a cost in energy and CO2 emitted, the additional CO2 fixation and energy-biomass allowed by the fertilizers must be taken into account. Well managed, dosed without excess, fertilizer is a powerful lever for trapping atmospheric CO2. The search for maximum efficiency of fertilizers, the optimal management of these elements avoids pollution of the atmosphere and water. The notion of soil pollution by N and P is, however, a questionable concept, because it would amount to refusing any form of fertilization under the pretext that it modifies “natural” soil. Agriculture is by definition a modification of a natural ecosystem. Well-managed fertilizers do not degrade the soil, on the contrary, they improve it and increase its fertility. Rather than expressing objectives in terms of reducing input consumption, it is better to consider input efficiency, to be maximized, and net flow of losses, to be minimized. This involves monitoring water, soil and crop potential. To manage N-P stocks and flows and assess the risk of P transfer to water, we must promote land analysis, which is used too little, and its mapping. Mineral balances and leaks to the environment vary greatly between production systems, as shown for example in relation to P, for regions of France, (Senthilkumar et al, 2012, Nutrient Cycling in Agroecosystems, 92(2), 145 -159) Another illustration: P leaks to surface water on a watershed scale are on average of the order of 0.5 kg P/ha.year, or approximately 2% of the level of agricultural inputs/ha (Dupas et al, 2015, Ecological Indicators, 48, 396-407) mainly due to particle transport, and therefore erosion. More than the use of fertilizer, it is erosion that is to blame for the escape of P. It will be better to promote scientifically rational and economical management methods for fertilizer flows (see the action of Comifer in France) rather than regulated, rigid management. The EU must also promote intra-European scientific and technical collaboration at the scale of large production systems, to improve situation assessment tools and fertilizer flow reasoning tools (EJP Soil.

Feedback reference
F3249944
Submitted on
25 April 2022
Submitted by
Stefanie SIEBERT
User type
Business association
Organisation
European Compost Network ECN
Organisation size
Micro (1 to 9 employees)
Transparency register number
26513411360-51
Country of origin
Germany
Initiative
Nutrients – action plan for better management

ECN welcomes the initiative to set up an integrated nutrient management plan with regard to a comprehensive legsilative approach to become carbon neutral by 2050 and to set up a Circular Economy in Europe. Bio-waste plays a key role in the Circular Economy. Bio-waste can be turned through organic reycling (composting and anaerobic digestion) into high-quality compost and digestate, which are used as organic soil improvers and organic fertilisers on soils. Today 15,8 million tonnes of compost and digestate are recycled form biowaste, which can replace 129 thousand tonnes of nitrogen and 42 thousand tonnes of phosphates per year. Besides nutrients replacement, 5,3 million tonnes of organic carbon is delivered as stable organic matter to the soils. Organic matter plays a key role in keeping soils healthy. Therefore, the sustainable use of recyled organic fertilsers and soil improvers (like compost and digestate) should be considered in the integrated nutrient management plan in a more prominent way. Sustainable agriculture and horticulture both rely on healthy soils and nutrient recycling. This is not only common sense, but it also forms the basis of the EU's Circular Economy Strategy set out in the European Green Deal. However, current agricultural practices have, in many instances, eroded soil, thereby reducing its productivity and resilience. We therefore plea not only to focus on (mineral) nutrient balances, but also to recognise as well the role organic carbon plays in soils. Repeat applications of quality assured compost and stabilised digestate can help improve the health and productivity of agricultural and horticultural soils. Compost does this in a number of different ways. It can: Increase soil organic matter, helping to store carbon. Improve soil structure, which reduces compaction. Increase the soil's water holding capacity, reducing irrigation and storing water during heavy rainfall events. Increase the number and diversity of organisms in the soil. Increase plant nutrient levels, which reduces the need for artificial inorganic chemicals. Increase the buffering capacity of the soil, helping it to hold onto nutrients for longer. Recycling nutrients in compost and stabilised digestate and returning them to soil benefits the environment in a number of important ways: It reduces demand for chemically manufactured nitrogen fertilisers – as the manufacturing process is very energy intensive this significantly reduces greenhouse gas emissions, which are thought to be about 1% of total global emissions. It reduces emissions to the air and water courses – the organic matter in compost and digestate helps bind plant nutrients, preventing them from being washed into watercourses. In addition, as nitrogen in compost is bound up with other compounds, it is released slowly over time and

helps form a nutrient ‘bank’ in the soil so that the nutrients are present for plant growth for a number of years. It reduces mining of elements, such as phosphorus and potassium, and lime – as phosphorus is an EU Critical Raw Material, recycling P helps conserve this valuable resource within Europe. For further information, access ECN Status report and the fact sheets on the sustainable use of compost 'Soil fertility and productivity' & soil structire and carbon storag available on our website: www.compostnetwork.info

EIP-AGRI Focus Group - Nutrient recycling
The value of recycling organic matter to soils
Classification as organic fertiliser or organic soil improver
Adrie Veeken (NL), Fabrizio Adani (IT), David Fangueiro (PT), Lars Stoumann Jensen (DK)

1. Introduction

Nutrient recycling mainly involves the recycling of organic waste or residual sources from agricultural, industrial and communal activities. Relevant organic sources are animal manures and organic wastes from urban and industrial activities (Möller, 2016). In the European Waste Framework directive, organic waste is legally defined by the term bio-waste: biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises, and comparable waste from food processing plants. Bio-waste does not include forestry or agricultural residues, manure, sewage sludge, or other biodegradable waste such as natural textiles, paper or processed wood; it also excludes those by-products of food production that never become waste (European Commission, 2008).

Nutrient recycling is mainly focussed on nitrogen (N) and phosphate (P) as these components can replace chemical fertilisers to minimise extraction of fossil P resources and to reduce the environmental impacts of mineral nitrogen fertiliser production. Additionally, when not properly managed, nutrient recycling may result in negative environmental impacts as nitrogen and phosphate can pollute groundwater and surface waters and ammonia and nitrous oxide may be released to the atmosphere, contributing to eutrophication, acidification and climate change. The Nitrate directive, Water Framework directive and NEC directives are the regulatory instruments that prevent and control these negative impacts.

In the discussion related to nutrient recycling of organic sources a relevant aspect is often overlooked: the value of organic matter for sustaining soil quality. Agriculture is not only about nutrient application, for an economically viable agricultural production system soil quality and production (soil fertility) are of key importance. In this, soil organic matter (SOM) plays a crucial role as it is directly related to chemical, physical and biological properties of the soil (Murphy, 2014):

- Soil organic matter has clear effects on water holding capacity, cation exchange capacity, aggregate stability and buffering capacity to acidification.
- Soil organic matter also has a definite effect on the compaction and strength characteristics of soils which in combination with friability can determine how the soil responds to traffic and tillage.
- Soil organic matter is an important factor in providing a nutrient supply and in nutrient cycling, especially of nitrogen, but also of significant proportions of phosphorus and sulphur and other micronutrients.

Besides organic matter, organic sources can also deliver compounds such as lime, K and Mg and trace elements. These aspects are not covered in this mini-paper.

Farmers acknowledge the importance of soil organic matter as they use exogenous sources of organic

matter and apply management practices to minimise SOM decay (Soilservice, 2012; EIP-AGRI, 2015).
But despite this awareness, intensive agricultural practices have resulted in a decline in soil fertility and
SOM across European regions. Decreases in SOM appear mainly as a consequence of intensive arable cropping systems and an underestimation of the relevance of soil organic matter (European Commission,
2011).
Based on these arguments, nutrient recycling by organic sources should not only focus on nutrient recycling but also on the value of organic matter in the organic sources. As such, organic sources can both serve as nutrient fertiliser and/or as soil improver. On the other hand, the nutrient efficiency of organic sources is variable and can be hard to predict. Moreover, when organic sources are applied as soil improver, care should be taken to avoid excess N and P dosing, resulting in soil and water pollution.
Therefore we consider it important to make a distinction between organic sources that mainly contribute
to nutrient fertilisation and organic sources that mainly contribute to soil organic matter. In this way, organic sources can be applied in a dedicated way and negative environmental impacts can be prevented. In this chapter the idea of distinguishing organic sources in an organic fertiliser or an organic
soil improver is further elaborated. For this, we first focus on composition and features of the various organic sources. Next, we present parameters that can be used to best represent the properties of a fertiliser and a soil improver. Based on these parameters a classification scheme is proposed to distinguish between an organic fertiliser and an organic soil improver. The mini-paper ends with conclusions and recommendations for research and policies.

2. Pros and cons of the application of organic sources in agriculture

As discussed before, organic sources can have a positive effect on the soil quality and supply nutrients.
However, negative aspects of the application of these organic sources should not be ignored. As discussed in the mini-paper by Eory et al. (2016), assessing the environmental effects of recycled organic fertilisers is a complex task where the whole life cycle of the products needs to be considered. Instead of applying the comprehensive assessment methodology of the life cycle assessment (LCA), we
limit ourselves here to addressing the most relevant aspects that need to be considered when assessing organic sources, as shown in Table 1.
This mini-paper will only focus on the effective organic matter in relation to nutrient supply resulting in
a classification scheme for organic fertilisers and soil improvers. The other aspects are not within the scope of this paper but are partly addressed by other mini-papers of this EIP-AGRI Focus Group on Nutrient Recycling.

Table 1. Main aspects to be considered in the assessment of organic sources when applied in agriculture

Positive effects	Negative effects
Soil fertility and quality. Organic sources can increase soil organic matter (SOM). Soil organic matter plays a key role in maintaining soil aggregation and aeration, hydraulic conductivity and water availability, cation exchange and buffer capacity and the supply of mineralisable nutrients.	
	Nutrient leaching. Mineral nitrogen and phosphate and mineralisation of organic matter may result in emissions of N and P to ground and surface water when the nutrients are not used by plants.
	Gaseous emissions. Presence of mineral nitrogen

(ammonium) may result in NH3 emissions (acidification and particulate matter formation) and anaerobic degradation and transformations process may lead to emissions of CH4 and N2O (greenhouse gases).
Carbon storage. Degradation of organic matter can be reduced in soil and in this ways carbon can be sequestered for longer periods. The net carbon sequestration may reduce CO2 emissions and mitigates global warming. It is still under debate what the magnitude of this carbon cycle–climate feedback is (He et al. 2016)
Inorganic and organic pollutants. Organic sources may contain unwanted substances that may harm the flora, fauna and humans. Examples are heavy metals, PAH's, dioxins, pesticides, residues of medicines, etc.
Safety/hygienic aspects. Presence of human and plant pathogens, animal by-products, weeds and seeds, etc.
Disease suppression. Organic soil amendments can reduce the impact of soil-borne diseases (Bonanomi et al. 2010).
Macroscopic impurities. Presence of materials such as stones, glass, metals and plastics can be harmful and also decrease the market value of the product.

Criteria for safe use of organic sources such as compost and digestate are established in the upcoming revision of the Fertiliser Regulation (European Commission, 2016). These criteria are based on the study
elaborated by the Joint Research Centre's Institute for Prospective Technological Studies (JRC-IPTS) to
establish end-of-waste criteria, i.e. criteria that a given waste stream has to fulfil in order to cease to be waste (Saveyn and Eder, 2014). To prevent the presence of contaminants in compost/digestate and guarantee the safe use in agriculture, a restrictive list of input materials can be used and prevents the use of the organic fraction of mixed municipal household waste, sewage sludge, industrial sludge, dredging sludge, and animal by-products of category 1 (according to Regulation (EC) No 1069/2009). Also, quality assurance schemes (QAS) for compost and digestate have been introduced in several European Member States in the last 20 years. On the basis of these experiences the European Compost
Network developed a European Quality Assurance Scheme (ECN-QAS) for compost and digestate (European Compost Network, 2016).

3. Organic sources to increase soil organic matter

Organic matter has a positive impact on the physical, chemical and biological characteristics of the soil
(Diacono and Montemurro, 2010). Different organic matter pools affect different soil functions. There are many possible organic sources of fresh organic matter that can be added to the soil for the creation of soil organic matter; examples are crop residues, forest litter, manure, compost and digestate. Some types of organic matter break down quickly and some take longer to degrade. In contrast to fresh plant residues or animal manure, composted or digested organic materials decompose slowly when added to soil because they have already undergone a significant amount of decomposition during the biological treatment, concentrating the more recalcitrant fraction.

To express the rate of decomposition (or degradation), the term effective organic matter (EOM) is introduced. EOM is defined as the organic matter that is still available after one year after incorporation
in the soil. The remaining percentage of organic matter is also referred to as humified (residual) organic
matter. Table 3 in the appendix shows the effective organic matter content of several organic sources

together with the nutrient composition. EOM is calculated from the organic matter content and the humification coefficient (HC), where HC is defined as the fraction of effective organic matter to total organic matter. During composting, organic matter is degraded and water is evaporated resulting in compost with a high organic matter content and humification coefficient. Therefore, EOM values of compost can be a factor 10 higher compared to fresh manures.

4. Classification of organic sources as fertiliser or soil improver

Based on the discussion above we propose a classification for organic fertilisers and organic soil improvers. Whether an organic source can be considered a "fertiliser" or a "soil improver" depends on its effect on plant nutrition. Fertilisers are a source of readily available nutrients and have a direct, short-
term effect on plant growth. Soil improvers affect plant growth indirectly by improving the physical and
biological properties of the soil, such as water retention, aeration and microbial activity and diversity. A
suitable definition for both categories is given in the proposal of the revised Fertiliser Regulation (European Commission, 2016) as listed in Table 2.

Table 2 shows that the revised Fertiliser Regulation does not give a clear distinction between the two categories. Neither the nutrient content nor the organic matter content reflect the differences between a fertiliser and a soil improver:

- Minimum nutrient contents are given for an organic fertiliser but no maximum contents are given for a soil improver.
- Comparing the values of Table 3Table 3 with the legal definition in Table 2 shows that none of the solid organic sources can qualify as an organic fertiliser as the nutrient content is too low.
- Only total organic matter content (expressed as organic carbon) is given in Table 2 ignoring the concept of EOM that is directly related to the soil improving quality and not the total organic matter content.
- Remarkable to observe in Table 2 that the organic matter carbon of an organic fertiliser has to be higher than the organic matter content of an organic soil improver, 15% organic carbon vs. 7,5% by mass.

Effective organic matter (EOM)

When organic matter is applied to soils, decomposition by soil microbes starts. Part of the organic matter is used for growth of the microbes whereas another part is emitted as CO_2 through respiration. After some time, the more stable less easily degradable organic matter remains and contributes to the existing soil organic matter. The part of the input that remains one year after addition is called "effective organic matter".

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Table 2 Definitions of solid organic fertiliser and organic soil improvers according to the draft version of the revised
Fertiliser Regulation (European Commission COM(2016) 157 final)

Solid organic fertiliser	Organic soil improver
A fertiliser shall be a CE marked fertilising product aimed at providing nutrients to plants.	A soil improver shall be a CE marked fertilising product aimed at being added to the soil for the purpose of maintaining, improving or protecting the physical or chemical properties, the structure or the biological activity of soil.
An organic fertiliser shall contain carbon (C) and nutrients of solely biological origin, excluding material that is fossilized or embedded in geological formations.	An organic soil improver shall consist exclusively of material of solely biological origin, excluding material that is fossilized or embedded in geological formations.
A solid organic fertiliser shall contain 40% or more dry	

matter by mass.
The CE marked fertilising product shall contain 40% or more dry matter.
The CE marked fertilising product shall contain at least one of the following declared nutrients in the minimum quantities stated: 2,5% by mass of total nitrogen (N), 2% by mass of total phosphorus pentoxide (P2O5), or 2% by mass of total potassium oxide (K2O).
No declaration and minimum quantities of N, P2O5 and K2O.
Organic carbon (C) shall be present in the CE marked fertilising product by at least 15% by mass.
Organic carbon (C) shall be present in the CE marked fertilising product by at least 7.5% by mass.

We propose the following parameters to best reflect the difference between an organic fertiliser and an organic soil improver:

- The effective organic matter content (EOM): EOM gives good indication of the part of the organic matter that contributes to soil organic matter and soil quality. EOM can be determined by measuring the organic matter content and multiplying by the humification coefficient (HC of most organic sources are well documented).
- The mineral nitrogen content (N-mineral): gives good indication of nitrogen that is directly available to plant. N-mineral (ammonia and nitrate) determination is a standard routine analysis.
- The total phosphate content (P2O5): gives a good approximation of the P availability. Determination of total P2O5 is a standard routine analysis.

The availability of N-organic and P2O5 can also be measured by incubation tests but we have chosen here to select parameters that are relevant, readily available in literature for many organic sources and are easy to determine by standard chemical analysis (cheap and accessible).

For the classification, we use the intrinsic characteristics of both categories:

- an organic soil improver should contain a high level of EOM to contribute to soil organic matter and should be low in nutrients as it is not a fertiliser;
- for an organic fertiliser it is the other way around: high in nutrients and low in EOM.

Based on this concept, we introduce the ratios EOM/N-mineral and EOM/P2O5 as parameters to distinguish between fertiliser and soil improver shown in Figure 1 for the organic sources of Table 3.

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Figure 1 Classification of organic fertilisers and organic soil improvers on basis of EOM/N-mineral and EOM/P2O5
(numbers correspond to the numbers of the 2nd column in Table 3); EOM/N-mineral of 3 organic sources (#10,
#17, #21 and #28) are set at 400 as they have values >400 and would fall outside the graph

Figure 1 shows that almost all the organic sources congregate in two quadrants in the lower-left and upper-right corners. There is a clear distinction between products having a high EOM/N-mineral and EOM/P2O5 ratio and products with low EOM/N and/or EOM/P2O5. This also reflects common agricultural
practices: animal manures are mainly used as fertiliser value, they supply N and P needs of many crops
because greater than 25% of their total N and P contents are in forms readily available for crop uptake.

Compost is a good example of a soil improver, it is generally not considered a fertiliser substitute, and mainly used by farmers to build up soil organic matter and improve soil fertility.

Based on the results in Figure 1 we propose to complement the definitions of organic fertiliser and soil
improver in the revised Fertiliser Regulation (see Table 2) to make the differences between both categories more evident:

- Conditions to qualify as organic fertiliser: EOM/N-mineral<150 and EOM/P2O5<35

- Conditions to qualify as organic soil improver: EOM/N-mineral>150 and EOM/P2O5>35

There are only few organic sources that do not fulfil both conditions and/or fall in between.
This is a first proposal to classify organic sources that needs further elaboration and fine-tuning in collaboration with other stakeholders.

5. Conclusions

This mini-paper has the objective to make clear that recycling organic resources is more than just nutrients (N and P). Organic sources contain effective organic matter (EOM) that is essential to maintain soil fertility. Some organic sources like fresh animal manures mainly supply nutrients and only contain low levels of EOM. Other sources like green compost contains high levels of EOM and the amount of directly plant-available nutrients is low. Therefore, it makes sense to distinguish between these properties and establish two categories of organic sources for agriculture, i.e. fertiliser and soil improver.

Moreover, via organic sources it is often not possible to supply EOM, without at the same time also supplying N and P that may leach to ground- and surface waters.

To make farmers and policy makers more aware of the various organic sources, the differences between an organic fertiliser and an organic soil amendment were discussed. The draft revision of the Fertiliser Regulation already anticipates on this difference by introducing different product categories. However, in the definitions no clear distinction is made between the two categories. In this paper, a classification scheme is introduced to distinct between organic fertiliser and organic soil improver based on the rations of EOM/N-mineral and EOM/P2O5. Both parameters can be calculated from readily available data and are easy to determine by routine analysis. Also some discriminatory values are proposed to classify organic sources between organic fertiliser and organic soil improver.

Based on the classification scheme it may be of help to:

- Farmers: to choose the best organic sources for their specific need, fertiliser or soil improver
- Policy makers: to take into account the differences in properties between organic fertilisers and organic soil improvers when drafting new legislation.

In a recent study, D'Hose et al. (2016) have shown that farmers can use compost to increase organic matter in the top soil without inducing higher N and P leaching. In this way, soil quality can be improved without negative effects on groundwater and surface waters. Another positive aspect of soil improvers is the fact that EOM can possibly accumulated in the top soil increasing the total organic matter content, depending by pedoclimatic condition. In this way, EOM may contribute to carbon sequestration and reduction of greenhouse gas emissions. However, there is still debate about the effect of carbon stabilization processes and the turnover time of slow and passive reservoirs on the mitigation of global warming (He et al., 2016).

These positive effects of soil improvers could be an argument to give organic soil improvers a special status in European or national fertiliser legislation. For example:

- allow organic sources that classify as organic soil improver to be used outside the growing season
- nitrogen and phosphate in organic soil improvers could get a partial exemption in relation to the legal constraints for N and P as laid down in the Nitrate and Water Framework directive.

Research questions and needs

What type of external organic matter is needed to improve soil fertility? It is presumed that not the total

pool of organic matter affects soil fertility but specific fractions of organic matter. How can we describe
and assess the organic matter quality? Is Effective Organic Matter the proper indicator?
Elaborate further on the proposed classification of organic fertiliser and soil improver. Are the criteria EOM/N-mineral and EOM/P2O5 suitable or do we need other criteria? What values do we need to adopt
for the classification?
What are the mechanisms that determine the N and P leaching to soils in organic soil improvers? How can we improve soil fertility (soil organic matter) and at the same time minimise harmful N and P emission to soil and water?
Long-term field trials are needed to demonstrate the value of organic matter in organic sources for soil fertility and quality. Also, more information is needed to get more information on the leaching behaviour
of N and P in organic sources. Several examples of field trials are:
- BOPACT. Soil organic matter management within the legal constraints of the fertilization laws. Institute for Agricultural and Fisheries Research (ILVO, Flanders); http://pure.ilvo.vlaanderen.be/portal/nl/publications/soil-organic-matter-management-within-the-legal-constraints-of-the-fertilization-laws--bopact-field-trial(271dcd4b-5174-4944-af4d-00a621555ed1).html.
- FERTIPLUS. Fertiplus will take up the challenge to identify innovative processing technologies and strategies to convert urban and farm organic waste to valuable and safe products for agriculture and allow industries to develop projects and provide adequate information on use and quality of the products; http://www.fertiplus.eu/.
- REFERTIL. Reducing mineral fertilisers & chemicals use in agriculture by recycling treated organic waste as compost and bio-char products; http://www.refertil.info/.
- SmartSOIL. A research project which aim has been to contribute to reversing the current degradation trend of European agricultural soils by improving soil carbon management in European arable and mixed farming systems covering intensive to low-input and organic farming systems; http://smartsoil.eu/.

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Table 3 Composition of several organic sources with respect to organic matter, nitrogen and phosphate (all values in g/kg fresh matter or otherwise mentioned)

Organic sources	Number1	Dry matter	Organic matter	HC2 (% OM)	EOM	N-total	C/N3 (kg/kg)	N-mineral	N-organic	P2O5	EOM/N-mineral (kg/kg)	EOM/P2O5 (kg/kg)
Data Netherlands												
Pig slurry	1	57	43	0,33	14	7,1	3,5	4,6	2,5	4,6	3	3
Digested pig slurry	2	82	32	0,34	11	7,1	2,6	5,2	1,9	4,6	2	2
Cattle slurry	3	86	64	0,75	48	4,1	8,9	2,0	2,1	1,5	24	32
Digested cattle slurry	4	69	48	0,67	32	4,1	6,7	2,6	1,5	1,5	12	21
Solid pig manure	5	260	153	0,33	51	7,9	11,0	2,6	5,3	7,9	20	6
Solid cow manure	6	267	152	0,75	114	5,3	16,3	0,9	4,4	2,8	127	41
Bio-waste compost	7	661	217	0,90	195	7,6	16,3	0,8	6,8	4,2	257	46
Green waste compost	8	594	185	0,90	166	5,3	19,9	0,5	4,8	3,4	313	49
Data Flanders												
bio-waste compost	9	667	249	0,90	224	12,7	11,5	0,5	12,2	6,5	373	34
green waste compost	10	578	194	0,96	186	7,2	15,9	0,1	7,1	2,9	16955	64
solid pig manure	11	299	230	0,42	97	10,7	12,7	3,6	7,1	9,2	27	11
solid cattle manure	12	242	184	0,42	78	8,5	12,8	2,7	5,8	4	29	19
cattle slurry	13	86	64	0,40	25	5,2	7,2	2,9	2,3	1,5	9	17
pig slurry	14	83	56	0,36	20	8,6	3,8	5,5	3,1	4,2	4	5

digestate manure-energy crops 15 88 54 0,72 39 4,6 6,9 2,2 2,4 3,9 18 10
solids of digestate manure-energy crops 16 253 170 1,23 209 8,0 12,5 1,5 6,5 11,3 87 11
dried digestate manure-energy crops 17 839 522 0,79 411 22,3 13,8 0,8 21,6 37 5495 11
Data Denmark
digestate household waste 18 15 9,8 0,84 8 0,5 11,0 0,3 0,2 0,31 25 25
sewage sludge 19 160 112 0,44 45 5,6 11,8 0,02 5,6 6,4 224 7
bio-waste compost 20 575 302 0,94 272 10,1 17,7 0,04 10,0 7,9 302 34
green waste compost 21 625 188 0,954 178 7,2 15,4 0,02 7,2 6,1 4455 29
pig slurry 22 45 38 0,354 13 5,1 4,5 1,9 3,2 2,4 7 6
cattle slurry 23 85 68 0,754 51 4,5 8,8 0,7 3,8 2,0 69 26
Data Germany
pig slurry 24 5 38,2 0,334 13 5,6 3,96 4,2 1,4 2,8 3 5
cattle slurry 25 8 63 0,754 47 3,9 9,34 2,1 1,8 1,7 22 28
solid cattle manure 26 233 186 0,754 140 8,06 13,38 2,4 5,6 3,9 57 36
bio-waste compost* 27 638 247 0,94 222 9,44 15,86 0,6 8,8 5,0 370 44
green waste compost* 28 623 234 0,94 211 7,35 19,50 0,25 7,1 3,4 8425 63
1correspond to the numbers in Figure 1; 2Humification coefficient (HC): the remaining percentage of organic matter after one year of incorporation in the soil; 3assuming a C
content of 57% for OM; 4HC values of Denmark and Germany are derived from measured values of data from Netherlands and Flanders; 5EOM/N-mineral values higher than 400
are capped to 400 in Figure 1

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Submitted by
Thomas Briand
User type
Company/business
Organisation
Veolia
Organisation size
Large (250 or more)
Transparency register number
72103751229-92
Country of origin
France
Initiative
Nutrients – action plan for better management

Veolia welcomes the initiative to provide the EU with an action plan for better nutrient management, with the aim of ensuring the Union's food security. This includes reducing the dependency of the Union’s agriculture on single supplies, stopping eutrophication of inland and marine waters, and tackling the challenges of climate change and energy transition. The guiding principle of this strategy should be the development of the circular economy by taking full advantage, as much as possible, of the recovery of organic matter, of household origin or from the treatment of urban or industrial wastewater, when sanitary and environmental conditions allow it. This would boost local loops for phosphorus and nitrogen, while protecting soil and its organic content. Three legislative initiatives of the European Commission will facilitate and secure this implementation: - The European Commission has already identified the need to develop soil quality standards, harmonised monitoring and reporting requirements, and must set the objective of stopping soil pollution. - The revision of the Urban Wastewater Treatment Directive should increase the protection of water resources by reducing emission of nutrients and pollutants (heavy metals, emerging chemical pollutants) at source. This revision could be an opportunity to better align its provisions on sensitive areas with the Water Framework Directive and the Marine Strategy Framework Directive, which place the protection of receiving waters at the centre of action. - Similar progress is expected from the revision of the Industrial Emissions Directive proposed by the European Commission on 5 April 2022, to curb the emission of pollutants directly into the receiving environment or via urban sewerage systems. The Sewage Sludge Directive also needs to be updated to take advantage of progress in pollution risk management and to ensure consistency of practices across Europe. The Nitrates Directive could also play a greater role in managing emissions from agriculture and promoting more sustainable practices. Furthermore, the greenhouse gas emission balance of phosphorus and nitrogen sources should be a structuring element in the preparatory work for the action plan, so that the strategies developed are consistent with the Fit for 55 package, among others. This package of legislative measures will promote and strictly control the return to the soil of organic matter from households or from the treatment of urban or industrial wastewater, to develop local loops of nitrogen and phosphorus, to the benefit of soils, agricultural production (reduction of imports of mineral fertilisers from outside EU), and for ecological transformation.

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Other
Organisation
Chambre Régionale d'Agriculture
Organisation size
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Country of origin
France
Initiative
Nutrients – action plan for better management

La Chambre Régionale d'Agriculture Auvergne Rhône Alpes (France) propose une contribution dans le document joint.

Contribution Call for contributions on the action plan for better nutrient management Contribution from the AURA Chambers of Agriculture network April 25, 2022 Levers identified to reduce N and P losses at the level of agricultural systems Levers relating to the efficiency and management of fertilization. This includes the use of fertilization management methods (forecast balance sheets for example), or the use of decision-making tools. Varietal levers can be investigated. Levers relating to the redesign of cropping systems. In particular for nitrogen, it is also possible to promote more nutrient-efficient rotations, e.g. by promoting the establishment of cover, or the incorporation of legumes (cover or main crop, alone or in combination). Levers relating to quality labels associated with agricultural operations (Agriculture Organic, High Environmental Value). With regard to livestock operations, levers can be identified to reduce nitrogen losses – aerial in particular – in livestock buildings, and when storage or spreading of effluent. Levers relating to the substitution of synthetic fertilizers on a territorial scale, by promoting recycling of organic fertilizer materials. Livestock manure can fill this role or not depending on the territory (surplus or demand for organic fertilizer). The spreading of sludge from wastewater treatment plants can be a source of recycled N and P. Finally, composts and methanization digestates can make it possible to recycle new sources of nutrients (biowaste for example). Issues and points of vigilance identified around this problem The plan must ensure not to impact the economic balance of agricultural operations (investments, working time, evolution of yields and quality of production, outlets for crops, etc.) and sectors. In connection with the previous point, the challenge of maintaining the quality of production. An example is maintaining the protein level targets for soft wheat. 2 Numerous agronomic levers (planting of cover crops or associated crops by example) are associated with technical brakes, which can vary depending on the conditions local pedo-climatic conditions. Organic fertilizers (livestock effluent, sludge from sewage treatment plants, compost, digestates) are not as easy to use as synthetic fertilizers. This is due both to the varying nutrient concentrations of these materials, and to the material and labor required for their spreading. Standards or regulations are necessary to ensure the safety of the use of these materials in the field (sludge from wastewater treatment plants example), but can also slow down their use. Social constraints are also identified. Issues surrounding the food autonomy of livestock farms: ensuring the quantity and quality of fodder (energy, nitrogen), in order to feed the herds. Issues around the modalities of application of the plan's measures (for example, the choice between incentive measures, obligations of means, obligations of results). The successes and limits of existing plans, for example in terms of measures concerning areas vulnerable within the framework of the nitrate directive, can be integrated into this reflection. Antagonisms may appear in certain practices. It is necessary to reason on all the compartments affected by these nutrients (soil, water, air), and to ensure not interfere with other issues (climate, biodiversity, for example). The plan must be able to adapt to different territories (local sectors, systems of production, pedo-climatic context).

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Paola Migliorini
User type
Non-governmental organisation (NGO)
Organisation
Agroecology Europe
Organisation size
Micro (1 to 9 employees)
Transparency register number
486889834865-61
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

Agroecology Europe, the European association promoting agroecology as a set of practices, a science and a movement across Europe, welcomes the Commission's initiative to work on an integrated nutrient management action plan. Europe's environmental security is being impacted by the alarming losses and leakage of nutrients from agriculture into the environment. This situation is inherently related to high-input use of conventional farming. For this reason, the redesign of farming and food systems is necessary, and agroecology can offer guiding principles to improve the management and increase the efficiency of nutrient use in agricultural landscapes. The fast increase of nitrogen fertiliser price is an incentive for accelerating the transition towards agroecological systems. For Agroecology Europe, soil fertility management in EU farming systems can mainly be improved by enhancing the synergies between livestock and crop production systems. This comes together with the extensification of livestock production of ruminants and monogastrics which would result in the (i) the restoration and resignification of semi-natural grasslands, (ii) the integration of leguminous crops (i.e. pulses, green manures and fodder plants) into crop rotations, (iii) the re-integration of livestock systems in specialised arable crop areas in order to avoid the transport of animal manure over long distances and to encourage better use of organic manure in specialised livestock production areas, (iv) (almost) permanent soil coverage by main and cover crops, (v) adoption of reduced tillage and (vi) implementation of diverse agroforestry systems. This will allow the maximisation of fertility transfers within agro-ecosystems, reduce soluble nutrient use and leaching and make farming systems more resilient and self-sufficient at the territorial level. This necessary shift in production based on the principle of "less and better" for livestock farming comes with a change in dietary goals towards a significant reduction and qualitative turn in animal protein consumption (meat, especially pig and poultry meat, fish and dairy products) in favour of plant proteins (Poux and Aubert 2018). This is why we encourage the Commission to demand a high level of ambition in the national strategic plans of each Member State that supports farming practices based on increased diversification and mixed crop-livestock production systems. Eco-schemes, in this sense, represent a significant lever. In that sense, the integration of legumes and the maintenance of permanent grasslands must be supported significantly. Integrated nutrient management must also be implemented at the territorial and regional level. Particular support for the development of territorial value chains that valorise intermediate crops, grain and

forage legumes, and sustainable livestock production should be established to encourage these changes in production and consumption practices. In this regard, demand-side policies should also be put in place through the support of sustainable and local public food procurements, for instance. Agroecology Europe is at the disposal of the Commission for any request it may have and would be pleased to offer its expertise in the legislative proposal on soil health.

Brussels, April 2022
Agroecology Europe's contribution to the public consultation
"Nutrients – action plan for better management"
Agroecology Europe, the European association promoting agroecology as a set of practices, a science and a movement across Europe, welcomes the Commission's initiative to work on an integrated nutrient management action plan.
Europe's environmental security is being impacted by the alarming losses and leakage of nutrients from agriculture into the environment1. This situation is inherently related to high-input use of conventional farming. For this reason, the redesign of farming and food systems is necessary, and agroecology can offer guiding principles to improve the management and increase the efficiency of nutrient use in agricultural landscapes. The fast increase of nitrogen fertiliser price is an incentive for accelerating the transition towards agroecological systems.
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This will allow the maximisation of fertility transfers within agro-ecosystems, reduce soluble nutrient use and leaching and make farming systems more resilient and self-sufficient at the territorial level.
This necessary shift in production based on the principle of "less and better" for livestock farming comes with a change in dietary goals towards a significant reduction and qualitative turn in animal protein consumption (meat, especially pig and poultry meat, fish and dairy products) in favour of plant proteins2 (Poux and Aubert 2018).
2 Poux X. & Aubert P.-M. 2018. An agroecological Europe in 2050: multifunctional agriculture for healthy
eating. Findings from the Ten Years For Agroecology (TYFA) modeling exercise. IDDRI Study 09/18: 74 pp
1 Buckwell, A. Nadeu, E. 2016. Nutrient Recovery and Reuse (NRR) in European agriculture. A review of the
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This is why we encourage the Commission to demand a high level of ambition in the national strategic plans of each Member State that supports farming practices based on increased diversification and mixed crop-livestock production systems. Eco-schemes, in this sense, represent a significant lever. In that sense, the integration of legumes and the maintenance of permanent grasslands must be supported significantly.
Integrated nutrient management must also be implemented at the territorial and regional level. Particular support for the development of territorial value chains that valorise intermediate crops, grain and forage legumes, and sustainable livestock production should be established to encourage these changes in production and consumption practices. In this regard, demand-side policies should also be put in place through the support of sustainable and local public food procurements, for instance.
Agroecology Europe is at the disposal of the Commission for any request it may have and would be pleased to offer its expertise in the legislative proposal on soil health.

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Gun RUDQUIST
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Academic/research Institution
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Stockholm University Baltic Sea Centre
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Sweden
Initiative
Nutrients – action plan for better management

Summary – for more information please read the enclosed document The Stockholm University Baltic Sea Centre (transparency reg no 514687319814-91) strongly supports the Commissions aim of closing the nutrient loops. Given an increasing population, increasing incomes and the resulting increases in environmental pressures, we need an accelerating ecological efficiency in our production and consumption of food – as well improvement of the efficiency of our nutrient cycles, as concluded in the UNEP report Our Nutrient World. Ecological efficiency should be the overarching objective of the nutrient action plan Nutrient use efficiency, NUE, for crops varies greatly between and within countries in the Baltic Sea region and has generally improved in the past decade, with some exceptions, but further improvements are necessary and possible. Diffuse pollution of nutrients, such as nitrogen and phosphorous predominantly from agriculture, is the largest source of anthropogenic nitrogen (70%) and phosphorus (53%) in the river loads to the Baltic Sea.1 Nutrients from all sources and their transport to fresh-and marine waters, must be minimized. The Baltic Sea has benefitted from actions on land to stop nutrient leakage and nutrient loads have been declining since the mid-1980s. Modelling shows that without these actions the present state of the sea would have been much worse. 2 Agriculture is the single largest source of new nutrients to the Baltic Sea (see here). Most of mineral fertiliser and livestock feed which is imported to the catchment area is transformed into manure; however, the nutrients in manure are often not used efficiently in crop production, increasing the risk of losses to the waters. These nutrient losses can be reduced by improving manure management and substituting imported mineral fertilisers with manure, as well as by reducing the import of livestock feed and the number of animals in regions with high livestock. More information on farm structure can be found here. A more circular approach to nutrient use relying on organic nutrient sources in manures, crop residues, sludges or composted wastes brings added complexity compared to inorganic fertilizers from industries, but is a necessity in order to reach the goals of Circular Economy. 1. HELCOM. “Sources and Pathways of Nutrients to the Baltic Sea.” Baltic Sea Environment Proceedings, 2018. https://helcom.fi/media/publications/BSEP153.pdf. 2. Murray, Ciarán J., Bärbel Müller-Karulis, Jacob Carstensen, Daniel J. Conley, Bo G. Gustafsson, and Jesper H. Andersen. “Past, Present and Future Eutrophication Status of the Baltic Sea.” Frontiers in Marine Science 6 (2019). https://doi.org/10.3389/fmars.2019.00002.

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Stockholm University Baltic Sea Centre's comments on
European Commission's Call for Evidence regarding
Nutrients – Action plan for better management

The Stockholm University Baltic Sea Centre strongly supports the Commissions aim of closing the nutrient loops. Seas and coastal areas are negatively affected by excess nutrients, resulting in e.g., increased algal blooms, regime shifts and changes in fish communities, and negative social and health impacts. The Baltic Sea has the largest proportion of coastal waters with excess nutrient concentrations among the European Seas1 ; altogether 97% of the Baltic Sea is affected by eutrophication.2

Diffuse pollution of nutrients, such as nitrogen and phosphorous predominantly from agriculture, is the largest source of anthropogenic nitrogen (70%) and phosphorus (53%) in the river loads to the Baltic Sea.3 Nutrients from all sources and their transport to fresh-and marine waters, must be minimized.

1 European Commission. "REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the Implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC)." LU: Publications Office, 2020. https://data.europa.eu/doi/10.2771/21854.

2 HELCOM. "State of the Baltic Sea – Second HELCOM Holistic Assessment 2011-2016." Baltic Sea Environment Proceedings, 2018.

3 HELCOM. "Sources and Pathways of Nutrients to the Baltic Sea." Baltic Sea Environment Proceedings, 2018. https://helcom.fi/media/publications/BSEP153.pdf.

The Baltic Sea has benefitted from actions on land to stop nutrient leakage and nutrient loads have been declining since the mid 1980s. Modelling shows that without these actions the present state of the sea would have been much worse.4 .

Given an increasing population, increasing incomes and the resulting increases in environmental pressures, we need an accelerating ecological efficiency in our production and consumption of food – as well improvement of the efficiency of our nutrient cycles, as concluded in the UNEP report Our Nutrient World. Ecological efficiency should be the overarching objective of the nutrient action plan.

Agriculture is the single largest source of new nutrients to the Baltic Sea (see here). Most of mineral fertiliser and livestock feed which is imported to the catchment area is transformed into manure; however, the nutrients in manure are often not used efficiently in crop production, increasing the risk of losses to the waters. These nutrient losses can be reduced by improving manure management and substituting imported mineral fertilisers with manure, as well as by reducing the import of livestock feed and the number of animals in regions with high livestock. More information on farm structure can be found here .

Whether or not reduced consumption of animal products leads to less eutrophication of waters depends on which animal products, how and where they are produced and the alternative production/action at farm level. For a full fact sheet read here.

4 Murray, Ciarán J., Bärbel Müller-Karulis, Jacob Carstensen, Daniel J. Conley, Bo G. Gustafsson, and Jesper H. Andersen. "Past, Present and Future Eutrophication Status of the Baltic Sea." Frontiers in Marine Science 6 (2019). https://doi.org/10.3389/fmars.2019.00002.

Illustration: Nutrient use efficiency for the Baltic Sea region calculated on mean values for nutrient usage 2008 – 2012.5

Legacy of phosphorus in the soils is a major source for external input to water. Research shows that almost half of the phosphorus currently entering the Baltic Sea could derive from a

pool of accumulated phosphorus on land (McCrackin et al. 2018). Phosphorus has
5McCrackin, Michelle L, Bo G Gustafsson, Bongghi Hong, R W Howarth, Christoph Humborg, Oleg P Savchuk, Annika Svanbäck, and Dennis P Swaney. “Opportunities to Reduce Nutrient Inputs to the Baltic Sea by Improving Manure Use Efficiency in Agriculture.” Regional Environmental Change 92, no. Part B (March 2018): 1–12. https://doi.org/10.1007/s10113-018-1308-8.

accumulated in many soils across Europe.6,7 Reducing leakage requires balancing plant availability and crop removal, treating accumulated phosphorus as a resource for plant growth.8
A more circular approach to nutrient use relying on organic nutrient sources in manures, crop residues, sludges or composted wastes brings added complexity compared to inorganic fertilizers from industries, but is a necessity in order to reach the goals of Circular Economy. A meta-analysis of nutrient budgets (N, P, K, Mg and S) on European organic farms, points to great variability between types of farms (vegetable, cattle/dairy, mixed or stockless arable farms), differences in methodology across sources and countries (farm gate vs. soil budget, but also inconsistencies between term definitions) calling for standardization and a need for further data collection and compilation.9 The available data showed on average positive N balances, owing to established alternative sources of N via e.g. biological fixation; a positive N budget is also necessary to counteract unavoidable losses via denitrification and/or residual nitrate leakage.9 The study showed mostly balanced budgets for P on organic farms but lifted a dependency on controversial P sources, e.g. sewage sludges.
One source for long-term concern, might be an evidenced deficit of K, mostly on stockless farms, and the scarcity of studies including Mg and/or S.9 Beyond the nutrient content that
6 Ballabio, Cristiano, Emanuele Lugato, Oihane Fernández-Ugalde, Alberto Orgiazzi, Arwyn Jones, Pasquale Borrelli, Luca Montanarella, and Panos Panagos. “Mapping LUCAS Topsoil Chemical Properties at European Scale Using Gaussian Process Regression.” Geoderma 355 (December 2019): 113912. https://doi.org/10.1016/j.geoderma.2019.113912.
7 Tóth, Gergely, Rannveig-Anna Guicharnaud, Brigitta Tóth, and Tamás Hermann. “Phosphorus Levels in Croplands of the European Union with Implications for P Fertilizer Use.” European Journal of Agronomy 55 (April 1, 2014): 42–52. https://doi.org/10.1016/j.eja.2013.12.008.
8 Nair, Vimala D, Lynn E Sollenberger, Willie G Harris, Andrew N Sharpley, Andressa M Freitas, Jose Carlos Batista Dubeux Jr, and Amanda N Rodriguez. “Mining of Soil Legacy Phosphorus without Jeopardizing Crop Yield.” Agrosystems, Geosciences & Environment 3, no. 1 (2020): e20056. https://doi.org/10.1002/agg2.20056.
9 Reimer, Marie, Kurt Möller, and Tobias Edward Hartmann. ”Meta-Analysis of Nutrient Budgets in Organic Farms across Europe”. Organic Agriculture 10(1):65–77 (2020). doi: 10.1007/s13165-020-00300-8.

may be heterogeneous and/or the difficulty to procure some nutrients, the mineralization-immobilization turnover (MIT) – the delay after which microbial decomposition of the added organic material gives a net supply of plant-available nutrients – needs to be better understood for each kind of amendment to guide their utilization and synchronize the nutrient availability with crop demands, and thereby ensure a high NUE and a minimal risk for leakage.10,11
Nutrient cycling in soils is tightly dependent on soil health and soil micro-organisms as promoters of key transformation processes involved in e.g. the MIT or N2O emissions12, and as such the nutrient action plan links to EU soil strategy. In order to reduce the risk of nutrient leakage from soils, manure has to be handled more effectively. The conditions of the soils influence manure management. The role of manure for improved soil structure should be part of the soil strategy.
Soil carbon stabilization (and associated nutrient retention) can be promoted by improving soil structure (e.g., no tillage) and increasing the diversity of residue inputs to soil (e.g., crop rotations, diversified agriculture, cover crops).12
Reduction of nutrient sources from soils can have clear advantages for water quality, but there

are trade-offs to be considered. For example, nitrogen additions have the potential to reduce
10 Kaleeem Abbasi, M., M. Mahmood Tahir, N. Sabir, and M. Khurshid. “Impact of the Addition of Different Plant Residues on Nitrogen Mineralization–Immobilization Turnover and Carbon Content of a Soil Incubated under Laboratory Conditions”. Solid Earth 6(1):197–205 (2015). doi: 10.5194/se-6-197-2015.
11 Luxhøi, Jesper, Sander Bruun, Lars Stoumann Jensen, Jakob Magid, Anne Jensen, and Thomas Larsen. “Modelling C and N Mineralization during Decomposition of Anaerobically Digested and Composted Municipal Solid Waste". Waste Management & Research 25(2):170–76 (2007). doi: 10.1177/0734242X07076419.
12 Lehmann, Johannes, Deborah A. Bossio, Ingrid Kögel-Knabner, and Matthias C. Rillig. ‘The Concept and Future Prospects of Soil Health’. Nature Reviews Earth & Environment 1(10):544–53 (2020). doi: 10.1038/s43017-020-0080-8.
6 (6)
carbon dioxide emissions and increase carbon storage.13 Therefore, the cycling of carbon and nutrients should be monitored and considered together for effective soil management.
The following researchers has contributed to answering the consultation; Benoit Dessirier, Bo Gustafsson and Bärbel Muller-Karulis.
On behalf of Stockholm University Baltic Sea Centre
Gun Rudquist
Head of policy
13 Janssens, I. A., W. Dieleman, S. Luyssaert, J. A. Subke, M. Reichstein, R. Ceulemans, P. Ciais, A. J. Dolman, J. Grace, G. Matteucci, D. Papale, S. L. Piao, E. D. Schulze, J. Tang, and B. E. Law. “Reduction of Forest Soil Respiration in Response to Nitrogen Deposition”. Nature Geoscience 3(5):315–22 (2010). doi: 10.1038/ngeo844.

Feedback reference
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Submitted on
25 April 2022
Submitted by
Konstantin Ivanov
User type
Environmental organisation
Organisation
Global Water Partnership Central and Eastern Europe
Organisation size
Small (10 to 49 employees)
Country of origin
Slovakia
Initiative
Nutrients – action plan for better management

GWP CEE asserts that nature-based solutions should be integrated into nutrient management and that it is paramount that the current inadequate wastewater collection and treatment in rural areas is bound with the lack of water and nutrients in agriculture in the immediate vicinity. Under the currently valid EU legislation wastewater collection and treatment in small settlements (<2000 PE) is not clearly regulated. Revision of the Urban Wastewater Directive (91/271/EEC) considers policy changes for remaining pollution, which comes also from small villages and towns and individual collection systems not falling within the scope of the Directive. The number of small settlements in Central and Eastern Europe is significant, inhabiting 30% of total population, and inappropriate treatment of wastewater from these settlements causes pollution of surface and groundwaters. the region (Istenič et al., 2021). Determination of a feasible wastewater collection and treatment system in rural and peri-urban areas is a complex process that should consider not only geographical features, water supply systems, financing, and regulations but also potential for reuse of reclaimed water and coupling with other sectors like agriculture and energy, especially when they are present in local environment and thus providing short circuits. Wastewater reuse is addressing global environmental problems such as (i) water deficit in dry (e.g., Mediterranean) and/or agricultural areas (agriculture uses 70% of fresh water); (ii) nutrient depletion (mineral phosphorous fertilizers are obtained from mineral ores and present unrenewable resource); and high energy needs for production of nitrogen mineral fertilizers and wastewater treatment. Simple and robust technologies such as nature-based solutions (NBS) that have low operation and maintenance requirements and costs, are recognised as most suitable for rural areas. In addition, NBS are important building blocks for resource recovery (van Hullenbusch et al., 2021) thus their implementation needs to be promoted and the reuse of wastewater treatment products (i.e., water, nutrients, biomass) must be integrated in water and nutrient management in rural areas. The shift of existing water management toward circularity can be achieved by a variety of approaches and technologies. Decentralized water reuse systems can provide reclaimed water close to where wastewater is generated (Masi et al., 2021) and provide a sustainable solution for wastewater collection and treatment as well as water and nutrient reuse. European research and innovation projects show that NBS are one of the most suitable options for this purpose (e.g., HYDROUSA). However, technologies such as treatment wetlands, lagoons, high-rate algae ponds, willow systems, and similar are currently not recognized sufficiently by local authorities, water utilities, and the public and that needs to be changed in the future. Decentralized wastewater

treatment and reuse systems provide reclaimed water in their vicinity, meaning locations where wastewater is generated and where reclaimed water is reused are close together, reducing the cost of building new transportation systems to bring reclaimed water from the central treatment plant to the reuse locations. Decentralized systems allow for better source control because they are smaller and contain mainly pure domestic wastewater that is not mixed with industrial wastewater. Consequently, the potential for safe reuse of water and nutrients is higher. Furthermore, NBS can be implemented as green infrastructure and their use provides numerous co-benefits besides water treatment, such as microclimate mitigation, water retention, carbon sequestration, biodiversity, and wellbeing. Decentralized solutions can be coupled with source separation,... For more information please read the attached document prepared by the Sustainable Sanitation Task Force of GWP CEE led by Dr Darja Istenic.

EU Integrated Nutrient Management Action Plan
Feedback by GWP CEE Sustainable Sanitation Task Force
Sustainable sanitation task force is a group of experts from Central and Eastern Europe addressing the lacking and improper
wastewater collection and treatment in rural areas of the region. The task force is working in the framework of Global Water
Partnership Central and Eastern Europe since 2011.
Under the currently valid EU legislation wastewater collection and treatment in small settlements (<2000 PE) is not clearly regulated. Revision of the Urban Wastewater Directive (91/271/EEC) considers
policy changes for remaining pollution, which comes also from small villages and towns and individual
collection systems not falling within the scope of the Directive. The number of small settlements in Central and Eastern Europe is significant, inhabiting 30% of total population, and inappropriate treatment of wastewater from these settlements causes pollution of surface and groundwaters. the region (Istenič et al., 2021).
Determination of a feasible wastewater collection and treatment system in rural and peri-urban areas is a complex process that should consider not only geographical features, water supply systems, financing, and regulations but also potential for reuse of reclaimed water and coupling with other sectors like agriculture and energy, especially when they are present in local environment and thus providing short circuits. Wastewater reuse is addressing global environmental problems such as (i) water deficit in dry (e.g., Mediterranean) and/or agricultural areas (agriculture uses 70% of fresh water); (ii) nutrient depletion (mineral phosphorous fertilizers are obtained from mineral ores and present unrenewable resource); and high energy needs for production of nitrogen mineral fertilizers and wastewater treatment.
Simple and robust technologies such as nature-based solutions (NBS) that have low operation and maintenance requirements and costs, are recognised as most suitable for rural areas. In addition, NBS are important building blocks for resource recovery (van Hullenbusch et al., 2021) thus their implementation needs to be promoted and the reuse of wastewater treatment products (i.e., water, nutrients, biomass) must be integrated in water and nutrient management in rural areas.
The shift of existing water management toward circularity can be achieved by a variety of approaches and technologies. Decentralized water reuse systems can provide reclaimed water close to where wastewater is generated (Masi et al., 2021) and provide a sustainable solution for wastewater collection and treatment as well as water and nutrient reuse. European research and innovation projects show that NBS are one of the most suitable options for this purpose (e.g., HYDROUSA). However, technologies such as treatment wetlands, lagoons, high-rate algae ponds, willow systems, and similar are currently not recognized sufficiently by local authorities, water utilities, and the public and that needs to be changed in the future.
Decentralized wastewater treatment and reuse systems provide reclaimed water in their vicinity, meaning locations where wastewater is generated and where reclaimed water is reused are close

together, reducing the cost of building new transportation systems to bring reclaimed water from the central treatment plant to the reuse locations. Decentralized systems allow for better source control because they are smaller and contain mainly pure domestic wastewater that is not mixed with industrial wastewater. Consequently, the potential for safe reuse of water and nutrients is higher. Furthermore, NBS can be implemented as green infrastructure and their use provides numerous co-benefits besides water treatment, such as microclimate mitigation, water retention, carbon sequestration, biodiversity, and wellbeing.

Decentralized solutions can be coupled with source separation, making the recovery of nutrients, organics, energy, and water more efficient compared to centralized systems. Domestic wastewater can be separated by collecting greywater, blackwater, and urine. Greywater can be treated with NBS. In domestic wastewater, urine accounts for 80% of the nitrogen, 55% of the phosphorous and 60% of the potassium, but only 1% of the total wastewater volume. Therefore, if urine is separated at the source, the NPK recovery is easier.

GWP CEE asserts that nature-based solutions should be integrated into nutrient management and that it is paramount that the current inadequate wastewater collection and treatment in rural areas is bind with the lack of water and nutrients in agriculture in the immediate vicinity.

Cited sources:

Istenič, D., Bodik, I., Gajewska, M., Merissar, M., Mubi Zalaznik, A. 2021. Wastewater collection, treatment, and reuse in rural areas of Central and Eastern Europe; Report of the Sustainable Sanitation Task Force. Global Water Partnership Central and Eastern Europe, 2021.

Masi, F., Langergraber, G., Santoni, M., Istenič, D., Atanasova, N., Buttiglieri, G. 2021. Possibilities of
nature-based solutions and hybrid decentralized solutions for reclaimed water reuse. In: Advances in Chemical Pollution, Environmental Management and Protection, volume 5, pp. 145-187. pondhttps://doi.org/10.1016/bs.apmp.2020.07.004

van Hullenbusch, E., Bani, A., Carvalho, P., Cetecioglu, Z., De Gusseme, B., Di Lonardo, S., Djolić, M.,
Eekert, M. et al. 2021. Nature-based units as building blocks for resource recovery systems in cities. Water, 13(22): 3153 https://doi.org/10.3390/w13223153

Feedback reference
F3249882
Submitted on
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Submitted by
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User type
Academic/research Institution
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INRAE
Organisation size
Large (250 or more)
Country of origin
France
Initiative
Nutrients – action plan for better management

This action plan has been long awaited and therefore requires in-depth reflection. Regarding the management of livestock effluent, this plan could also integrate the carbon cycle. The various existing European policies (and associated scientific research) are still too compartmentalized and applied independently of each other, which does not facilitate their adoption on the ground. In order to integrate the different compartments (water, air, soil) and the different elements (C, N, P), a detailed diagram (grouping together the existing diagrams) and quantifying the different flows relating to effluent management should help to evaluate the weight of the impacts at different scales (is the reduction of nitrates locally (or must be compatible) with the reduction of NH3 emissions? greenhouse gases?) and to choose the measures to favor according to the context local or regional. This action plan will be all the better accepted if all the measures listed/proposed will be argued and their effect quantified country by country.

Feedback reference
F3249864
Submitted on
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Organisation
Fachverband Chemische Industrie Österreich (FCIO)
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Small (10 to 49 employees)
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01523296397-60
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Initiative
Nutrients – action plan for better management

Nutrients – action plan for better management FCIO statement on the EC exploratory study “Nutrients – action plan for better management” The Farm to Fork and Biodiversity Strategy aims to find sustainable solutions that contribute to greater climate protection and biodiversity while at the same time enabling the productivity of European agriculture and the supply of healthy, affordable food. In principle, the FCIO welcomes this approach, but the European Commission proposes unspecific and high reduction targets. The EC would like to “take measures to reduce nutrient losses by at least 50% by 2030 while maintaining soil fertility, thereby reducing the use of fertilizers by at least 20%”. Enabling productive agriculture A too ambitious reduction target for the use of fertilizers increases the risk that soil fertility will be lost. The purpose of fertilization is to meet the nutritional needs of the crops being grown by adding the right type and amount of plant nutrients based on expected yield, plant growth and soil analysis. Not all crops have the same needs. With the harvest, the nutrients bound in the crop are transported away from the fields; this must then be compensated for through fertilization. If the withdrawal of plant nutrients is, on average, greater than the supply, this leads to soil leaching. An arbitrary reduction target would contradict the agronomic principles of integrated and balanced plant nutrition and should therefore be critically questioned. Sustainable agriculture requires a holistic approach - this is based on location-appropriate crop rotations, good professional practice, but also modern protection of plants from diseases and pests. Only healthy plants use nutrients efficiently and without loss. New technologies such as “Precision Farming” application processes and the determination of the current, site-specific nutrient requirements also make it possible to take into account all available nutrient sources, such as the farm's own manure and any currently increased nutrient release from previous crops and catch crops. Instead of imposing a general and unnecessary reduction target, the easily measurable nitrogen use efficiency (NUE) in the EU could be increased by at least 10% by 2030, which would also significantly reduce nutrient losses and still maintain or improve productivity. In addition to the economical, efficient use of fertilizers, this approach also leads to more biodiversity, as the high productivity in favorable locations allows land to be set aside from marginally productive marginal soils. An evaluation methodology is still needed for phosphorus use efficiency. The EU should therefore provide an appropriate agricultural research budget for this as part of the “Horizon Europe Mission”. Impact assessment required To ensure that European agriculture can continue to produce at a high level, a holistic approach is needed. The FCIO therefore advocates an independent and comprehensive impact assessment - before any legal decisions are made.

Feedback reference
F3249861
Submitted on
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User type
Business association
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V.H.E.Association of Humus and Soil Management e.V. (VHE)
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Micro (1 to 9 employees)
Transparency register number
German Lobby Register R003381
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Initiative
Nutrients – action plan for better management

The intergrated nutrient management initiative which its holistic apporach to the nutrient cycles will look – among others - on measures how to „stimulating the market for recovered or recycled nutrients“. We welcome, the initiative for improvements of soils and environmental threats against nitrogen and phosphorus surpluss in general. Since nutrient recycling is only partially addressed in the initiative, we would welcome measures, that would give recycled fertilizers (compost, digestates) a higher priority. This also appears to be unavoidable in view of the current developments and dependencies on the fertiliser markets. Compost and digestates produced from separate collected biowaste are already widely used in the EU as organic fertilzer or organic soil improver; further increase of compost and digestate production is expected in future. Compost and digestates application to soils combines both sustainable nutrient and organic matter removal to soils, which are key element for good plant growth and soil fertility. We see the need for the initiative should to have a deeper look on these high-carbon - fertilizer and soil improver for improving soil humus content and providing recyceld nutrients for plant and soil nutrition additionally. In these context the primary focus on a criteria „agronomic efficiency for the use or recycled nutrients“ would not be target-orientated and sufficient. It must be taken into account, that for obtaining and increasing stable humus-carbon in soils also nitrogen amounts are needed for enableing micorbiological transformation of carbon-rich material into humus compounds (see illustration VHE_HuMussLAND _2020 pdf). These nitrogen demand needed for soil humus incorporation cannot be calculated as part of the „nitrogen surpluss“, but have to be considered and included as a kind of „ N-humus-credit“ in required nutrient balances. Furthermore it cannot be generalized, that compost and digeates as organic fertilizer which an low nitrogen efficiency and high humus reproduction potential, is exposed to an increased threat of uncontrolled nitrate mineralisation and leaching. Further assessments on nitrate-leaching potential and phosphate -translocation potential of compost /digestate fertilisation according to good agricultural practices and local conditions should be initiated. We propose, that the use of compost and digestates, which high amounts of organic bounded nitrogen and low content of direct available nitrogen, has to be assessed under a new indicator, which take the humus-reproduction of the material into account correspondingly. We would like to emphasise that the nutrient initiative should take into account that not only plants nutrition, but under certain circumstances the soil needs to be supplied with nutrients such as nitrogen

and phosphorus as well. A pure focus on supplying plants, as is done for example in the German Fertiliser Ordinance, can lead to humus depletion with associated CO2 emissions. With humus fertilisation/ humus build-up via compost, which requires certain organically bound nutrients, especially N, compost fertilisation ensures a return of CO2 from the atmosphere into the humus matrix of the soils. This is particularly relevant for those arable farming systems in which the humus content in the soils has been depleted in recent years, increasingly. National regulations set additonal requirements for compost applications use on agricultural soils based on EU Nitrate Directive requirements. One mandatory measure within the action programms -relate to vulnerable zones - is the application limit of nitrogen from manure of 170 kg (Ntot) /ha/a. These legal requirements with an 1:1 transfer to compost /digestates application in national regulations has to be reassesed in order to enable and continue a humus-management with compost /digestates within located vulnerable zones in future. Such inconsistencies in legislation need to be reviewed.

Feedback reference
F3249834
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25 April 2022
Submitted by
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Small (10 to 49 employees)
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Initiative
Nutrients – action plan for better management

EasyMining supports an EU nutrient policy. However, the INMAP will not be a sustainable nutrient action plan if efficient use and recycling of safe nutrients is not a target with clear goals and actions. The transition to a circular economy is crucial in building a sustainable society. Today, almost half of our climate impact and 90 percent of water scarcity issues are linked to the way we extract resources and produce goods and food. In this context, nutrients such as Phosphorus (P) and Nitrogen (N) are key. Without them, global agricultural output would be cut in half. Wastewater from households and industries contain massive amounts of both P and N. But today, this is a problem rather than an asset. Wastewater treatment plants (WWTPs) put great efforts into discarding sludge even though it is rich in P, and N that is released from the plants as N20 and has a huge climate impact as greenhouse gas. With a different approach, the opportunities are enormous. P, listed by the EU as a critical raw material (CRM), can be recovered from sludge and brought back into the loop, securing an endless supply. Today, the EU is largely (92%) dependent on import as most mines are located outside Europe (incl. Russia). Because of the limited availability of this scarce resource, the large ecological footprint from mining, geopolitical instability in the source countries, long transport and health issues from cadmium contamination; safe recycling of P needs to be a top priority with clear goals and actions in the INMAP. N can be captured from wastewater streams and used to produce fertilizer, replacing today's greenhouse gas-heavy production, which is dependent on natural gas supply. This way, the WWTPs of today will be the resource plants of tomorrow. This scenario is well within reach. However, it requires key alterations in national and international legislation and regulation. Here, the INMAP action plan can play an important role to make the WWTPs resource plants. INMAP should not be limited to water policy, climate change and CRM policies. The plan should aim at closing nutrient cycles, pushing for the missing piece in the value chain – nutrient recycling. For this to happen, INMAP should include goals to create safe and sustainable loops when closing nutrients cycles with clear criteria: Reduce the exploitation of natural (virgin) resources: Include a high demand on recovery of P from sewage sludge (in cooperation with the new Sewage Sludge Directive (SSD) and Urban WWT Directive) of at least 80%, to close the P cycle and reduce the dependency of imported mined P that also often contain contaminants (e.g., Cd). Real detoxification, i.e., real removal and not just dilution of hazardous contaminants: High quality, clear scenically based limit values and function demands for all recovered products and end-use applications to both prevent contaminating the food cycle and the environment but also to get a clear level of playing field for all types of products

(e.g., recovered nutrients in mineral fertilizers, biochar, sewage sludge) and markets (e.g. EU Fertilise Regulation, EU soil strategy, SSD). Enable recovery & recycling of materials with good quality and efficient function suitable for their applications: End of Waste criteria for recovered nutrients to bridge the gap between the recovered nutrients and the recycled end-products, to be able to reach the market focusing on high quality demands and not origin. The above criteria will assure that debts are not passed on to future generations. Clear principals for recycling of nutrients fulfilling the above criteria would lead to an alignment with the EU circular economy action plan and the goals set out in the green deal package and the farm-to-fork strategy (e.g., zero pollution ambition, preserving and restoring ecosystems and biodiversity, healthy and environmentally friendly food systems and mobilising industry for a clean and circular economy).

Hindrance in the legislation for reused nutrients
Sara Stiernström, 2022-04-22
easymining.se 1 (10)

RECOVERED NUTRIENTS: AN INEVITABLE PART OF OUR FUTURE SUSTAINABLE BUSINESS

From Wastewater Treatment Plants to Resource Plants

By adding relevant criteria on recovery of nutrients, detoxification in the treatment and recovery steps as well as quotas in the production of fertilisers and feed materials; the taxonomy can play an important role in the transition from wastewater treatment plants to resource plants.

Today, almost half of our climate impact and 90 percent of water scarcity issues are linked to the way we extract resources and produce goods and food. In this context, nutrients such as phosphorus and nitrogen are key. Without them, global agricultural output would be cut in half. Wastewater from households and industries contain massive amounts of both phosphorus and nitrogen, but today, this is a problem rather than an asset. Wastewater treatment plants (WWTP) put great effort into discarding sludge, even though this sludge is rich in phosphorus, and nitrogen is released from the plants as nitrous oxide (N20) which has a huge climate effect. With a different approach, the opportunities are enormous. Phosphorus, listed by the EU as a critical raw material, can be recovered from the sludge and brought back into the loop, securing an endless supply. This goes hand in hand with the taxonomy principles stated in 12.2 for Phosphorus recovery. However, Nitrogen can be captured from wastewater streams and used to produce fertiliser, replacing today’s greenhouse gas-heavy production.

This way, the wastewater treatment plants of today will be the resource plants of tomorrow. This scenario is well within reach. However, it requires key alterations in national and international legislation and regulation. Nevertheless, the taxonomy has a great role to play, to set criteria creating tomorrow's resource plants. Recovered nutrients is an inevitable part of future sustainable business.

Proposals

The INMAP action plan should:

• push for changing the stated purpose of urban wastewater treatment plants, making the enabling of increased circularity a main objective.
• give the task to national authority with coordinating control at source of hazardous substances and providing a central function for know-how and active support on issues around wastewater and resources.
• push for new legislation the introduce quota obligations for commercial fertilizer, requiring an increasing percentage of phosphorus and nitrogen in the products to be of secondary origin.
• include milestone targets for the recycling of phosphorus and nitrogen from wastewater for agricultural purposes.

Hindrance in the legislation for reused nutrients
Sara Stiernström, 2022-04-22

• strive to introduce legislation on requirements for the assessment and limitation of nitrous oxide (N20) emissions from wastewater treatment plants.
• push for allocation of funds for full-scale pilot facilities for extracting nitrogen from wastewater with the explicit purpose of producing raw material for fertilizer production.
• strive to increase incentives for a transition to circular handling of key resources, specifically by ensuring that the quality of the product should always be the key regulatory factor and not its origin.

1. Resource flows

In modern society, few flows can compare to the volumes of the water and wastewater sector. Using Sweden as an example, the average Swede uses between 120 and 140 kg of water every day, and that contributes to a flow of 300 kg of wastewater. At the same time, wastewater contains a number of valuable resources; materials which can be captured and put to use in an increasingly circular economy, paving the way for a sustainable society.

Companies and organisations in the water and wastewater sector can contribute to society in several ways above and beyond those which are regulated, encouraged or even possible today. Unlocking this potential means changing the conditions and purposes under which the industry operates. These changes affect the way the industry can direct its efforts towards increasing circularity, through modernised legislation and regulation, innovative systems, processes, and organisations.

Wastewater and sewage sludge are largely untapped resources today. Traditionally, they are regarded as problematic waste. Hence, the usual purpose of wastewater treatment plants is reduced to handling this perceived problem by simply purifying the water, from a limited waste perspective.

The introduction of circular principles leads instead to substantial potential for reducing climate gas emissions by bringing resources back into the loop. Lawmakers and business leaders around the globe can seize this opportunity and turn wastewater treatment plants into resource plants, creating climate benefits as well as jobs, tax revenue and wealth.

2. Secure recirculation of phosphorus and nitrogen

Without the nutrients phosphorus and nitrogen, farmers would not be able to grow the amount of food we need. Despite this, Europe and many other regions and countries around the world depend on imports, while wasting phosphorus and nitrogen that we already have.

In our cities, we have enormous amounts of phosphorus and nitrogen literally beneath our feet: in the sewage systems. But instead of putting it to use, we waste the vast majority, for example by covering discontinued landfill areas with it.

When nitrogen is removed from wastewater using today’s biological methods, it is simply released back into the atmosphere, mostly as N2. At the same time, new nitrogen compounds for fertilizer are produced by capturing nitrogen, N2, from the air, using a process invented more than 100 years ago which leads to substantial carbon emissions.

New technology makes it possible to extract very pure phosphorus from sludge of poor quality instead of letting it go to waste. Other innovations have given treatment plants easy ways to recover the nitrogen from wastewater in solid form, which can be used immediately in the production of fertilizer. This process leads to a powerful reduction of greenhouse gas emissions, both at the plant and as production of nitrogen compounds for fertilizer is replaced by raw material straight from wastewater.

When this happens, the wastewater plant has become a resource plant, supplying markets with commercially viable materials while substantially lowering carbon emissions. Countries that make this transition also become more resilient, as their dependence on imports is gradually replaced by recycled nutrients from their own wastewater. What was once a problem has been turned into a huge opportunity.

However, the low costs of production using new materials is a tangible obstacle to such a transition, as it tilts the playing field to the disadvantage of innovations that do not mitigate climate change. For this reason, politicians must act to usher in functional markets for recycled

nutrients, increase demand, and ensure incentives for businesses and treatment plants to invest in new green technology.

3. Nitrous oxide: The number one climate challenge for wastewater treatment plants

The single largest climate impact of today's wastewater treatment plants is linked to the removal of nitrogen by biological methods. In addition to being vulnerable to several factors for functionality, biological nitrogen removal leads to large emissions of nitrous oxide, N_2O, a powerful greenhouse gas also known – and used – as laughing gas.

It´s effects on climate change is around 300 times as potent as carbon dioxide, making it one of the most important greenhouse gases. According to research published by the Intergovernmental Panel on Climate Change (IPCC) in 2020, global emissions of nitrous oxide are in fact higher than even the most pessimistic climate scenarios.

Several Scandinavian studies from 2020 show that nitrous oxide emissions from individual wastewater treatment facilities may be 10 times higher than previous calculations have indicated. Additionally, increasingly tougher regulation on the share of nitrogen which must be removed from the wastewater in order to curb eutrophication will lead to even more emissions of laughing gas unless new methods are introduced. This puts pressure on governments to act, as they have to make sure that the treatment of wastewater does counteract efforts towards other obligations, such as maintaining healthy marine environments and contributing to lower carbon emissions. The challenge can be addressed by making new use of the nitrogen in wastewater. Countries which are early in implementing modern chemical methods for nitrogen removal will benefit from increased control over emissions as well as establishing a circular industry and replacing imported nitrogen fertilizer compounds with local production.

Research into large-scale solutions is being conducted in several countries. One example is the collaboration between innovation company EasyMining, a subsidiary of the Ragn-Sells Group, and the municipal wastewater treatment company of Danish capital Copenhagen. The method causes nitrogen compounds to crystallise and precipitate, making it suitable for fertiliser

Hindrance in the legislation for reused nutrients

production, while cutting nitrous gas emissions to zero. An adjacent facility turns the raw material into commercial fertilizer. This chemical method can replace biological treatment at a lower operating cost thanks to the decreased need for energy and making sure that the nitrogen is circulated instead of released.

Examples of nutrient recovery technologies for sustainable business

EasyMining (part of Ragn-Sells group), dedicated to closing nutrient cycles, welcomes the opportunity to provide input to technical screening criteria for the EU taxonomy. EasyMining has developed and patented several chemical processes and holds a great know-how in chemistry, resource efficiency, circular business models and industrial symbiosis. Our objective is to improve existing or even to create new circular material flows efficiently and commercially viable.

Our technologies; Ash2Phos, Ash2Salt and Project Nitrogen produce clean commercial materials; fertilisers or feed products in a circular economy and are examples of innovations that can help to create sustainable business.

Today, EasyMining has three main processes:

- Ash2Salt: from incinerated flyash to potassium chloride
- Project Nitrogen: from waste water to ammonium sulphate
- Ash2Phos: from sewage sludge ash to precipitated calcium phosphate

SALT RECYCLING

EasyMining, owned by the Swedish environmental company Ragn-Sells, is an innovation company dedicated to closing nutrient cycles. EasyMining's Ash2Salt process, an example of chemical recycling, extracts salts from high chloride containing fly ashes. In this process, heavy metals are precipitated and commercial grade potassium chloride, sodium chloride and calcium chloride as well as an aqueous ammonia solution are extracted. Both the potassium chloride and the ammonium sulphate are produced in a quality suitable as component materials in

fertilisers.
The first Ash2Salt production facility is currently being built at Ragn-Sells' recycling plant Högbytorp outside Stockholm, Sweden. The plant will have a capacity to treat 130 000 tons of fly ash per year, producing 3 500 tons potassium chloride (KCl) per year (dry) and will be in operation in 2022.
The recovered potassium chloride has a purity of 99.1% and would fulfil the quality requirements of the new fertilising products legislation.
Needed action; The new fertilise legislation (the EU Fertilising Products Regulation 2019/1009) need to add nutrients recovered from incinerated household waste.
AMMONIUM RECYCLING
EasyMining´s Nitrogen Removal Process enables efficient removal and recovery of ammonium from aqueous flows. EasyMining's new patented innovation enables efficient removal and recovery of ammonium from aqueous flows. In our unique solution nitrogen is captured by an adsorption chemical and separated from the wastewater or process water. As a second step the

captured ammonium is recovered in a conversion plant to a fertilizer and the adsorption chemical is regenerated to be used again.
RECOVERED NUTRIENTS – REMAINING LEGAL BARRIERS
EasyMining, part of Ragn-Sells group, is an innovation company developing patented processes for extracting nutrients from waste streams. Our technologies; Ash2Phos, Ash2Salt and Project Nitrogen produce clean commercial products.
In short about our processes (see Figures last in document):
• Ash2Phos: from sewage sludge ash to a clean precipitated calcium phosphate
• Project Nitrogen: from waste water to clean high quality products (e.g. ammonium sulphate)
• Ash2Salt: from incinerated house hold waste (i.e. fly ash) to potassium chloride
The potential markets for these clean reused products are (see Figure 1):
• Feed additives for animal feed products (calcium phosphate from the Ash2Phos-process)
• Fertilisers for organic farming
• Fertilisers for conventional farming
Today, all these markets are closed for our recovered products (and for other products from recycling companies trying to develop new innovative technologies), even though our products, due to the efficient technologies, are the purest on the market (e.g. cadmium below 0.1 mg/kg in the recovered phosphorus product). In general, the regulations are focusing on origin instead of quality.
For the EU to stop being dependent on the import of fertilisers, to decrease CO2 emissions in the mining and production of fertilisers and to facilitate circulation of critical raw materials (i.e. phosphorus) and domestic production, these legislative hindrances need to be fixed fast. We need legislation focusing on high quality and not banning on origin.
Another action to create a market for recovered nutrients, is a quota system for blending in recycled nutrients in fertilisers and feed products.
BARRIER #1
RECOVERED PHOSPHORUS IN ANIMAL FEED
Today, there is a total ban on using recovered nutrients from materials "derived from domestic and industrial waste water" and "solid urban waste" in animal feed (Annex III, Regulation 767/2009). This regulation need to be reversed to connect more efficient to use of resource and to make it possible to use recovered nutrients in the future animal feed and feed additive products.

BARRIER #2
RECOVERED NUTRIENTS IN ORGANIC FARMING
The regulations for organic farming would need the CMCs to be added for the recovered nutrients in the conventional farming's regulations first. After that, the different nutrients/products need to be added to the list of approved materials in Annex I, Regulation 889/2008. This will then also comply with the commission`s ambition of harmonized regulations.
BARRIER #3
RECOVERED NUTRIENTS IN CONVENTIONAL FARMINING
Today, the fertiliser regulation for conventional farming is missing component material categories (CMC, Annex II, regulation EU 2019/1009 EIF 2022) for many different recovered nutrients from different waste streams (e.g. incinerated household waste, leachate from landfills etc). This is a barriers for EU to get a sustainable nutrient action plan with recycling of nutrient as a key action.
A report published in 2019 (STRUBIAS*) has added a proposal for three more CMCs to be added to Annex II. This additional CMCs will be implemented. However, we still need nutrients (e.g. potassium chloride) from e.g., ash from incinerated household waste to be approved and implemented.
*https://op.europa.eu/en/publication-detail/-/publication/f2109276-d831-11e9-9c4e-01aa75ed71a1/language-en

Figure 2. Ash2Phos process
Figure 3. Project Nitrogen
Figure 4. Ash2Salt process

Recycled quota crucial for critical raw materials like phosphorous
Phosphorous (P) is a key nutrient in the global food value chain yet arguably one of the most underappreciated essential elements on the periodical table. While the European Commission added phosphate rock to its Critical Raw Materials list in 2014, more needs to be done, now, to simultaneously stimulate recovery technologies and encourage market uptake of recycled phosphorous.
In short, phosphorous is an indispensable element for all forms of life, and amongst other things, plays an important role in the metabolic transfer of energy in plants and animals, in genetic material (DNA), in nerve cells and in bones.
– That's why phosphorous is a key component in agricultural fertilisers, used to promote plant growth, vitality and yield, and in feed phosphate, to ensure the vitality and health of livestock, says Anna Lundbom, Marketing and Product Sales Manager at EasyMining.
However, phosphorous is a finite resource, extracted primarily from phosphate rock (apatite) that is found in a few deposits around the world. Herein lies the challenge. Globally, approximately 85 percent of the extracted phosphate is used in fertilisers and around 7 percent is used in livestock feeds. In Europe, there is a small deposit in Finland meaning that over 90 percent of phosphorus used in the EU-27 (The 27 member countries of the EU) is imported from outside the EU. In numbers, figures (2017) from Eurostat and Fertilizers Europe suggest that the EU-27 uses about 1.1 million tonnes of elemental phosphorous in European fertilisers.
Growth of sewage sludge incineration
This implies that the entire EU agriculture- and food value chain is almost completely reliant on imported phosphorus, with all the associated geo-socio-political risks that such dependency entails. Thus, from a circular "grow, eat, defecate and flush" perspective, it stands to reason that sewage sludge, a residual of municipal wastewater treatment plants (WWTPs), would be the natural go-to source of "post-consumer" phosphorous for recycling. Using sanitised sewage

sludge as a fertiliser is though strictly regulated on account of it containing other undesirable components, such as heavy metals, pharmaceutical residues, consumer chemicals, and microplastics.
As a result, agricultural valorisation of sewage sludge is decreasing. Instead, sewage sludge incineration is fast becoming the sludge treatment method of choice. Especially for high population density countries like the Netherlands, and Germany. In doing so, the volume of sludge material is radically reduced, sanitary safety is ensured, and organic contaminants such as pharmaceutical residues, microplastics or PFAS (Per- and Polyfluoroalkyl Substances) are eliminated.
Leveraging sewage sludge ash
According to figures compiled by EasyMining, an estimated 990 000 (dry) tonnes of sewage sludge was incinerated in the EU-27 in 2017. By 2030, this is expected to over double to around 2.26 million tonnes. Left from incineration is the sewage sludge ash (SSA) that contains both the desirable phosphorous (but in a form which is no longer plant-available) along with unwanted

heavy-metal contaminants. This means that as ash, the phosphorous cannot be recycled to agriculture and goes to landfill, something that EasyMining has addressed.
EasyMining has developed Ash2Phos, a proprietary chemical process to recover phosphorus without contaminants from the ash.
– The ash from mono-incinerated sewage sludge typically contains seven to ten percent phosphorus making it a rich source to recover phosphorous from, says Anna Lundbom.
The three-step chemical process is energy efficient using room temperatures and atmospheric pressure.
– With our Ash2Phos extraction process we can recover at least 90 percent of the phosphorous from the sewage sludge ash, Lundbom says.
Quota needed to stimulate market uptake
Already in 2014, the European Commission added phosphate rock to its Critical Raw Materials (CRM) list. More recently, in its “Farm-to-Fork” Strategy, the Commission has proposed a target to reduce nutrient losses by at least 50 percent, without deteriorating soil fertility, resulting in a reduction in fertiliser use of at least 20 percent.
When it comes to phosphorous recycling, Germany and Switzerland have come the furthest with phosphorous recovery from sewage sludge to become mandatory for wastewater treatment plants – for all sewage and meat and bone meal ash in Switzerland, for sewage works 50 000 person equivalents (p.e.) or larger in Germany. Sweden is pondering a similar route. Thus, it is in Germany and Sweden that EasyMining has its first two commercial projects, in Schkopau and Helsingborg respectively, in various stages of development.
– All these initiatives are welcome and good for encouraging overall resource efficiency but do not necessarily stimulate the use of recycled phosphorus over virgin phosphorous. The EU Green Deal recognises this problem and refers to possible “legal requirements to boost the market for secondary raw materials, with mandatory recycled content”[i]. That is why we propose that an incremental quota for recycled phosphorous in fertiliser be introduced, reaching five percent in 2030, says Anna Lundbom stressing that it should be designed as an overall market quota, including for imported fertilisers, not a mandatory blend in all phosphorus containing fertiliser products.
Why five percent?
Given the current (2017) amounts of sewage sludge ash, around 500 000 tonnes generated in Europe (EU-27, Norway, Switzerland, and the UK), and using an average of nine percent phosphorous content, this translates into over 45 000 tonnes of available phosphorous potential. With close to 1.2 million tonnes of sewage sludge ash forecasted by 2030, this potential increases to over 108 000 tonnes. With a recovery efficiency rate of 90 percent, around 97 000 tonnes of this potential could be “EasyMined” by the end of the decade from sewage sludge ash, annually.
– This is equivalent to over eight percent of the phosphorous currently used as fertiliser in the

EU-27. These numbers suggest that a five percent quota based on phosphorus recovery from

sewage sludge ash alone is entirely feasible. This is without taking into consideration an overall reduction in the use of fertilisers as per the Farm-to-Fork Strategy. Furthermore, if other sources of recycled phosphorus such as struvite – magnesium ammonium phosphate – are included, then the quota can and should be expanded, Lundbom remarks.
She adds that the idea is not new. In November 2020, a policy memorandum presented by the German Phosphorus Platform (Deutsche Phosphor-Plattform DPP e.V.)[ii] recommended that the German government examine further possibilities of economic incentives to promote the market access of phosphorous recyclates by pricing in environmental costs, quotas, subsidies/taxes, market steering through bans / bids and equal cadmium limits for all fertilisers.
Regulatory adjustments needed to close the loop
For use as feed phosphate, the second major market for phosphorous, there are other legislative hurdles to overcome as current regulation is based on origin and not quality as Anna Lundbom explaines.
– Current legislation for feed material is linear, prohibiting the use of recovered nutrients that have originated from wastewater treatment to prevent food chain contamination. However, we are recovering phosphorous from the ash of thermally decomposed sludge. Our Ash2Phos process does not involve problematic input materials or chemicals. The mass balance of the process is favourable and 96 to 100 percent of the heavy-metal contaminants in the original ash removed, says Anna Lundbom.
The latter is a critically important point. EasyMining's recycled phosphorous product – precipitated calcium phosphate (PCP) – is cleaner, with much lower levels of heavy metal toxins such as cadmium (Cd), than found in virgin phosphate rock. This means that, with legislative change, it could be used as a final product in feed phosphates and fertilisers for use in organic farming, without the additional purification steps that are currently required to remove contaminants from phosphate rock-derived products.
Furthermore, over time, the increased use of recycled phosphorous from sewage sludge ash in agriculture could have a detoxifying effect by lowering the overall levels of cadmium in the food value chain.
– By implementing a mandatory, incremental quota for detoxified, recycled phosphorous for fertiliser volumes sold and used in EU, and updating regulation to focus on phosphorous quality, the EU would take the global lead in this development. It would not only support the ambition in the EU Green Deal but also boost industrial investments in circular solutions, create green jobs, and strengthen European autonomy in essential supply chains. By market uptake for re-circulated phosphorus implementation will speed up at the same time as it will be cost effective for EU, concludes Anna Lundbom.
[i] COM(2019)640 https://ec.europa.eu/info/files/communication-european-green-deal_en
[ii] https://www.deutsche-phosphor-plattform.de/pressemitteilung-politikmemorandum-der-deutschen-phosphor-plattform-dpp-e-v-2020-positionen-zur-umwelt-und-landwirtschaftspolitik/

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Submitted on
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Submitted by
Monika Epenstein
User type
Company/business
Organisation
Kemira Oyj
Organisation size
Large (250 or more)
Transparency register number
934980845504-83
Country of origin
Finland
Initiative
Nutrients – action plan for better management

Kemira welcomes progress towards integrating the EU's nutrient policies, with the development of INMAP (Integrated Nutrient Management Action Plan). Kemira also supports the Green Deal objective to reduce nutrient losses by 50% while ensuring that there is no deterioration in soil fertility. As rightfully described in the Commission's Call-for-Evidence document, nutrients, such as phosphorus (P) and nitrogen (N) are essential elements for life and important natural resources. However, at the same time, human activities significantly alter natural nutrient cycles. Ending up in "wrong places" these initially essential elements do represent a severe threat to nature instead. Once, excess nutrients get flushed into lakes, rivers, or out to the sea they mainly fertilize algae and other aquatic plants that grow uncontrollably and endanger biodiversity. Climate change is making it worse because the problem grows in warm water. Fertilizers in agriculture have been identified as a major source of pollution, followed by industrial and domestic wastewaters. The consequences of this so called "eutrophication" can be seen in, for example, the Baltic Sea, where toxic algal blooms during the summer of 2018 covered almost the entire Gulf of Finland at their peak. Therefore, Kemira asks to further limit particularly the phosphorus pollution coming from wastewater effluents. We believe, discharged limit values of phosphorus in the current Urban Waste Water Directive (UWWTD) under revision are not strict enough, as also the European Environmental Agency report on the state of European waters illustrates. Today, much better results can be achieved by applying established wastewater treatment technologies, without increasing the cost of treatment significantly. Only political will is needed for setting a new standard for cleaner waters in Europe. In detail, Kemira asks to halve the current phosphorus discharge limits ruled in the UWWTD. Today's limit of 2 mg of phosphorus (P) per liter of water (population centers of 10,000–100,000 people) and 1 mg of phosphorus per liter of water (population centers over 100,000 people) can be easily minimized. For example, nearly all wastewater treatment plants in Sweden and Finland achieve a maximum level of 0.5 mg P/l, and many plants have even stricter limits in place. Discharge levels of 0.2–0.3 mg P/l can be solidly achieved by combining chemical and biological phosphorus removal technologies. Kemira notes that the Commission's Call-for-Evidence document indicates the overall environmental costs of nutrient pollution at 70 – 320 billion €/year, but in fact this covers only the nitrogen pollution. An similar estimate of costs regarding phosphorus is equally needed. Anyway, lowering phosphorus discharge levels in

EU wastewaters will not only help to reduce environmental costs but also create socio-economic benefit. The more phosphorus is removed from wastewaters, the more can be recovered and reutilized as fertilizers. Phosphorus is listed as one of the 23 critical raw materials that are mostly imported into Europe; increasing recovery from wastewater would limit the need for these imports. In addition, the residual sludge from wastewater treatment can and should be used in the production of biogas. We believe, INMAP should effectively support the overall objective to move away from EU import dependency for phosphorus and define and implement regulatory, fiscal and other policy actions to achieve this. More efficient recycling of these nutrients would enable the further development of the market for secondary raw materials in Europe – enabling Europe to become more independent on critical raw materials.

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F3249727
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User type
Academic/research Institution
Organisation
Water Research Institute in Bratislava
Organisation size
Medium (50 to 249 employees)
Country of origin
Slovakia
Initiative
Nutrients – action plan for better management

Water Research Institute and Ministry of Environment of the Slovak Republic welcome this initiative as the proposed achievements of the action plan supports the goals of Nitrate Directive implementation in Slovakia.

Feedback reference
F3249229
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Submitted by
Lionel JORDAN-MEILLE
User type
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Organisation
COMIFER (France, 250 adhérents)
Organisation size
Micro (1 to 9 employees)
Country of origin
France
Initiative
Nutrients – action plan for better management

Nutrients – action plan for better management COMIFER (France): our field of investigation, our principles The French Committee for the Study and Development of Reasoned Fertilization (COMIFER) brings together institutional, technical, scientific, industrial and economic stakeholders around questions of fertilization and soil fertility management, on a French scale. It has several hundred members. It provides technical references allowing fertilization practices to be adapted to each soil and climate situation in accordance with the expected requirements on the products (e.g. protein content of cereals) while minimizing flows to aquatic and atmospheric environments. Comifer is interested in all fertilizing materials (mineral and organic fertilizers, amendments) which aim to improve plant nutrition and in all aspects of long-term management of soil fertility (maintenance of soil life, physico-chemical-biological fertility). He does not advocate for any particular interest group; transversality and scientific independence remain its strong point. COMIFER also positions itself at an international level by contributing to studies comparing fertilization reasoning and practices with countries close to France, on an agricultural and soil-climatic level. COMIFER opinion on the EC "Farm-to-Fork" initiative COMIFER pursues the same environmental objectives as the Commission, namely the reduction of nutrient flows into waters and the atmosphere. Our main lever of action is the establishment and then communication to technical advisors of good fertilization and soil management practices, including soil analyses, good conditions for applying fertilizing materials aimed at improve efficiency of use (forms/doses/dates of intake/reasoning on the rotation scale). Like the tools developed to contain nitrogen pollution (Nitrates Directive), COMIFER pushes and contributes to the development of tools that allow adaptation to the diversity of cultural and pedoclimatic situations. COMIFER supports and promotes solutions and approaches adapted to each context, realistic according to local risks and possibilities for action. We therefore believe that we must avoid imposing simplistic schemes, at the risk of them being unsuitable or even erroneous, which could lead to technical-economic impasses. Halfway between field operators and political decision-makers, we are raising awareness among the EC not to impose on the profession solutions which would appear arbitrary to it, or which would lead to an even greater increase in administrative obligations. The paths to progress must be realistic, scientifically based, and stick to territories and sectors. " In conclusion COMIFER is already helping to apply scientifically and technically justified reasoning in the field, for which the minimization of environmental losses is a major point of attention. The gap observed between the objectives of environmentally impeccable fertilization and the values of flows towards this environment is, for a large part, linked to the lack of dissemination and application of the recommended methods, which go well beyond only recommended doses of fertilizers. COMIFER remains available to the European Commission to make proposals to help it achieve its objectives of reducing nutrient losses, for the future benefit of its citizens, first and foremost the farmers themselves.

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Thorsten Scheile
User type
Business association
Organisation
Industrieverband Agrar e.V.
Organisation size
Small (10 to 49 employees)
Transparency register number
000764914245-74
Country of origin
Germany
Initiative
Nutrients – action plan for better management

The Industrieverband Agrar e.V. appreciates the opportunity to contribute to the consultation on a Nutrients' action plan for better management. Please refer to the document attached for detailed information.

Statement from the Agrarian Industry Association on the initiative:
Nutrients – action plan for better management
Appropriate and needs-oriented fertilization/nutrient supply of the plants with all important main and trace nutrients as well as site-specific pH value management are a basic requirement for healthy plant populations not only for high, stable yields with excellent product qualities (nutrition security), but also for a optimal utilization of the available and used nutrients as well as maintaining soil fertility. The combination of organic and mineral fertilization is considered optimal from the perspective of plant nutrition and, above all, soil fertility. Mineral fertilization is rarely the reason for excessive nutrient surpluses. In any case, optimized fertilization is essential to contribute to the overall reduction of nutrient emissions into the environment and to avoid nutrient and food shortages in the future. In order to best achieve the goal of halving nutrient losses, nutrient use efficiency indicators, such as the NUE indicator developed by the EU Nitrogen Expert Panel, should be recognized and used and the use of tools to achieve this goal (e.g. B. variable output, inhibitors). This will help make crop production more sustainable.
The Agricultural Industry Association e. V. (IVA), based in Frankfurt am Main, represents the interests of the agrochemical industry in Germany. The business areas of the 53 member companies include the areas of crop protection, plant nutrition and biostimulants.

material losses required
I. Who we are
The current high nutrient surpluses and the associated environmental problems result primarily from a regionally excessive amount of organic fertilizer from animal husbandry and from biogas plants. Mineral fertilization plays a role
II. There will be a holistic approach in the EU to reduce nutritional
III. Identify and reduce emission sources
The focus of the association's work is information about industry topics, especially about the importance of research and innovation for modern and sustainable agriculture. The manufacturers of mineral fertilizers and crop protection products also offer

innovative solutions such as biostimulants or inhibitors as well as biopesticides. They continually develop their products based on the latest scientific findings in order to meet the requirements of sustainably productive agriculture.
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https://www.sciencedirect.com/science/article/pii/S0167880921003443?via%3Dihub
This applies all the more in view of the often neglected, balanced supply of cultures with all macro and micronutrients. Mineral fertilizers are clearly indispensable for crop production due to their high efficiency and their nutrient composition, which can be adapted to acute needs.
• easy combination with nitrification and/or urease inhibitors
• very good water solubility and therefore immediate plant availability with particular relevance for fertilizers containing phosphate or sulfur,
Modern mineral fertilizers enable farmers to supply their crops with nutrients that are particularly targeted, tailored to their needs and therefore environmentally friendly.
in contrast, a smaller role. The transport of manure to arable farming regions with so far only little organic fertilization can represent part of the solution to the problem. However, technical innovations for the processing and transport of manure are energy-intensive and associated with (still too) high costs and are therefore currently neither economically nor comprehensively implementable.
• Nutrient amounts and application times for macro- and micronutrients that can be precisely tailored to the plant's needs and thus application on time and in accordance with needs and in a way that protects the soil,
position,
• precisely defined nutrient contents and precisely calculable nutrient availability
- 2 -
The higher efficiency of mineral fertilizers compared to organic fertilizers such as manure or digestate results from the following properties, which also enable optimal nitrogen supply to the crops with a minimal nitrogen balance surplus:
usually applied in too large quantities. If mineral fertilizers are replaced by significantly less efficient commercial fertilizers, this inevitably leads to a reduction in nutrient efficiency.
The nitrogen release from organic fertilizers can then hardly be calculated and other nutrients, such as phosphate, are then released via manure
• precise and low-loss distribution and good dosing,
• the possibility of controllable nutrient provision over longer periods of time (through coated and urea derivative-based long-term fertilizers),
The reduction of nutrient surpluses should be carried out in a sustainable manner and take into account all environmentally relevant aspects, including current studies1 on practical nutrient losses. From a crop production perspective, a balanced combination of organic and mineral fertilization is optimal. However, the widely discussed approach of completely replacing mineral fertilization on farms with high nitrogen surpluses with manure does not meet this requirement.
1
Machine Translated by Google
• no odor nuisance
Unfortunately, it is often not taken into account that the use of mineral fertilizers also indirectly has a positive effect on preserving biodiversity: by optimizing the yields of the intensively agriculturally used area, other areas can be kept free for more extensive forms of cultivation and biodiversity measures. This is also described as sustainable intensification or carbon-efficient land use.
• loss-free storage,
The most important measure to reduce nutrient losses remains fertilization that is adapted to the plant needs, both in terms of the amount of fertilizer and the timing of application and distribution. Therefore, from a crop production perspective, the use of mineral fertilizers must continue to be guaranteed as part of a low-loss, needs-based

and targeted nutrient supply to the crops.
• Possibility of area-specific fertilization (precision farming)
- 3 -
Together with scientifically derived application recommendations and methods for optimizing fertilization, mineral fertilizers and these innovative solutions contribute to a further increase in nitrogen efficiency as well as environmental and climate protection. This avoids unwanted nutrient losses in the form of ammonia and greenhouse gas emissions from agriculture. For example, with the use of urease inhibitors, a significant reduction in ammonia emissions from fertilizers containing urea can be achieved. The use of nitrification inhibitors in urea- and ammonium-based mineral fertilizers, but also in combination with organic fertilizers, significantly reduces emissions of the greenhouse gas nitrous oxide (N2O), which has a greenhouse effect that is around 300 times higher than CO2 . Since such fertilizers minimize unwanted nitrogen losses and thus increase efficiency, they are also called Enhanced Efficiency Fertilizers (EEFs).
Nutrients are exported from the field when the plants are harvested. To maintain soil fertility for sustainable crop yields and quality, nutrients exported from the field with the crop must come from organic and/or
Unfortunately, in this debate about nitrogen surpluses, mainly caused by regionally excessive animal populations, the fact that the manufacturers of mineral fertilizers also offer innovative solutions such as biostimulants or inhibitors to increase efficiency and constantly do so on the basis of current scientific findings in the area of plant nutrition and environmental impact is completely ignored develop.
IV. Improving nutrient use efficiency to reduce nutrient losses
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effectively prevent nitrogen losses. In fact, less is not always more. It is considered more sensible to optimize the relationship between crop yield (nutrient removal) and nitrogen supply. A high nitrogen fertilization, which has a high
Increasing land use efficiency as a way to reduce emissions
For nitrogen, the concept of nitrogen use efficiency (NUE) has existed for several years. This describes the relationship between the nitrogen supply to a crop and the nitrogen removal from the field through the harvest. The NUE can be described as the percentage of nitrogen contained in the plant (kg) to the nitrogen applied (kg). The nitrogen applied essentially consists of mineral and organic
fertilization, biological nitrogen fixation, nitrogen deposition and nitrogen residues from the previous year's cultivation. The European Nitrogen Expert Panel, a network of European scientists, decision-makers and representatives from the agricultural sector and industry, does not recommend a general reduction in nitrogen quantities
v.
mineral sources can be replaced. This is the only way to avoid overexploitation of the nutrient reserves
in the soil.
The example of phosphorus shows that a focus on agricultural practice increases the efficiency of the phosphorus used. The application method for mineral phosphorus sources in conjunction with better use of phosphorus from organic sources in the operation helps to increase the efficiency of phosphorus
use and reduce losses.
- 4 -
yield can be more efficient and cause low losses than a small amount of nitrogen at a very low yield. The action plan therefore represents an opportunity to create further incentives for sustainable nutrient management at the operational level. A location-adapted minimum productivity of agriculturally used areas must be guaranteed so that previously natural areas do not have to be used for food production in the future. However, in hotspot areas, redistribution of nitrogen inputs and improved nitrogen management may need to be complemented by other strategies, such as: B. reducing food requirements by reducing food waste.
Agriculture in Germany, Europe and worldwide is faced with a central conflict of objectives: the

humanitarian requirement to provide a qualitatively and quantitatively sufficient diet for a growing world population using the most efficient use of inputs while at the same time maintaining and increasing biodiversity and climate protection. The key to resolving the conflict of objectives is the most efficient use of land possible, through the consistent application of cultivation methods based on the principle of “sustainable intensification”. This means that the yield potential of the existing, limited
agricultural land is optimally used. This approach is particularly important in times like these, when the geopolitical importance of
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The focus is on agriculturally important productive locations and the issue of food security is once again present. In addition, only “sustainable intensification” can create scope for the renaturation of existing agricultural land for CO2 storage and as a refuge for endangered species. Conversely, a policy with the aim of reducing land productivity through extensification leads to the conversion of natural areas into agricultural land. In order to assess their effects, it is necessary to take a global perspective in order to also take into account area compensation and its consequences for species extinction and climate protection outside one's own borders. Alternatively, a radical regional perspective can also be used as a simulation, which allows the food production lost through extensification to be replaced exclusively through local land use change. In both cases, the importance of maintaining land productivity for climate change and species protection becomes clear. It makes neither economic nor ecological sense to use marginal areas without sufficient yield, but with a tendentially high level of biodiversity, for food production and to expand high-yield locations to do so.
In addition, the efficient absorption of nutrients by the crop must be supported. For example, nitrogen use efficiency can be increased through digital, area-specific fertilization, through the selection of the most efficient forms of nitrogen, through the use of urease and nitrification inhibitors (reduction of gaseous losses of ammonia and nitrous oxide as well as nitrate leaching) or through the use of long-term fertilizers (“controlled- /Slow-release fertilizer”) can be significantly improved. Nitrate-based fertilizers enable plants to absorb nitrogen directly and use water more efficiently, for example in dry conditions. Regionally adapted fertilization systems and strategies in combination with loss-reduced fertilizers offer opportunities to specifically use favorable weather and growth conditions for fertilizer application. The use of micronutrients and biostimulants can further improve the efficiency of fertilization and plant growth, particularly under difficult environmental conditions.
Appropriate and needs-oriented fertilization/nutrient supply of the plants with all important main and trace nutrients as well as site-specific pH value management ensure the maintenance of soil fertility.
A high level of land use efficiency requires the needs-based and targeted use of operating resources, especially fertilizers. The combined use of both highly efficient mineral fertilizers and organic fertilizers combined with modern, partly digitally supported use and application processes (“Smart Farming” and “Precision Farming”) ensure a low-loss nutrient supply.

With constantly evolving fertilization and application recommendations, technical innovations (QGIS, agro-meteorological prediction models, TOPSOIL EU soil database) are continually used to take regional characteristics into account even more specifically.
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Based on the above aspects, the action plan for better nutrient management must avoid one-size-fits-all approaches and one-size-fits-all approaches. Instead, it should enable the implementation of measures best suited to national/local circumstances (e.g. incentives for good practices, access to advice and knowledge exchange).
Contact
Agricultural Industry Association:
The use of efficient mineral fertilizers, innovative solutions and application

recommendations can make an exemplary, very important contribution to the reduction in nutrient losses aimed at by the European Commission.

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Machine Translated by Googleg

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Kajsa Pira
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83685894892-48
Country of origin
Sweden
Initiative
Nutrients – action plan for better management

We welcome the goal to halve nutrient losses. It will have great benefits through improved air quality, improved water quality, biodiversity and reduced N2O emissions. Halving NH3 emissions alone would bring health benefits that would outweigh the costs for reducing emissions(1). In the Farm to Fork strategy, a reduction of fertilizer use by 20 % by 2030 is mentioned. This is a good start, though we doubt that it will be enough to achieve the target. We believe national nitrogen budgets accompanied with national Nitrogen Use Efficiency (NUE) targets would be a holistic approach to improve overall nitrogen management in the member states. A nitrogen budget gives an overview of nitrogen flows between different pools. This great tool to direct efforts to where they are most needed, as well as avoiding pollution swapping. The concept of NUE describes the ratio of nitrogen in outputs to the nitrogen in inputs. This will vary depending on how system boundaries are set. We can see a benefit in having targets both at farm or field level, as well as for full-chain NUE for the entire country. Another approach that must be considered is a safe operating space for livestock. We find it hard to believe that the target can be achieved without a reduction of animal numbers, especially in areas where the concentrations of livestock are particularly high, where also nitrogen losses are at their highest. Developments in the Netherlands are a good example, where the government plan to cut livestock numbers by 30 % over the next seven years (2). This is a type of transition we would need to see in other regions with a high concentration of intensive livestock systems. A consequence of reducing livestock numbers, is a reduction of animal derived products. To minimize the risk of pollution leakage there is a need to simultaneously work for a change of diets. Worth considering is to apply the polluter pays principle to nutrient emissions. Conceivable measures to achieve this are taxes on livestock, animal products and fertilizers. The design of this type of tax must be done carefully, to avoid risks with emissions leakage and unreasonably high administrative costs. To increase acceptance, it is an advantage if the revenue can be returned to the farming sector, for example as investment funds for measures that further reduce nutrient losses. Some interesting examples are explored in a report by Deutsche Umwelt Hilfe (3). It is also appropriate to note all the legislation that already affects nutrient emissions. This includes the Nitrates Directive, the National Emission reduction Commitments Directive and the Common Agricultural Policy. In the latter case, it is important to ensure that the national strategic plans do not undermine the goal of reducing nutrient emissions. The current situation with Russia's

war in Ukraine has led to sharply increased prices on fertilizers. However, as the price of several crops has developed in the same way, it is not certain that this will automatically lead to a reduction in the use of fertilizers. It is rather likely that the price increase will be passed on to consumers Finally, we want to say that we look forward to legislation that takes a holistic approach to improve nutrient management in the European Union. We especially want to emphasize the importance of maintaining the ambition in the Farm to Fork strategy. Not only to minimize harm to people and the environment. But also, as it builds resilience to food system when agriculture becomes less dependent on inputs. (1) Gu et al., Science 374, 758-762 (2021) (2) Dutch News 16 February 2022, https://www.dutchnews.nl/news/2022/02/cattle-herd-to-be-cut-by-30-over-next-decade-to-meet-nitrogen-targets/ (3) Ökonomische Instrumente für eine umwelt- und klimafreundliche sowie artgerechte Tierhaltung by Forum Ökologisch-Soziale Marktwirtschaft on behalf of Deutsche Umwelt Hilfe, August 2021 Link: https://www.clean-air-farming.eu/downloads-und-links

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Sophie Agasse
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UNIFA
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Country of origin
France
Initiative
Nutrients – action plan for better management

Please find attached UNIFA's contribution to the call for contributions for a "better nutrient management" initiative. As you may know, the Union of Fertilization Industries (UNIFA) represents 36 companies that produce mineral, organo-mineral and organic fertilizers, basic mineral amendments and biostimulants. As a player in plant nutrition, UNIFA has been committed for many years to agriculture that respects the environment and ensures safe, quality food. As part of this contribution, we note that there are numerous regulatory tools at the European level aimed at limiting environmental impacts (Nitrates Directive, Water Framework Directive, NEC Directive, etc.) or even governing the implementation of the market for fertilizer materials and their use. They are subject to direct application or transposition in the various Member States. They can also be supplemented by national or regional regulations going beyond the framework defined at community level. These are policies often designed with an environmental objective in mind; nevertheless we notice that they are uncorrelated from each other and that they lack an integrated approach to the nutrient cycle. This is why an integrated plan, concerning the different sources of nutrient loss (agricultural, domestic and industrial) is of great interest. As such, different conditions for success are required: - A coherence of the various already existing public policy tools relating to nutrients (regulatory: directives, regulations; CAP etc.) - Taking into account the objective of food production in quantity and quality in our territories - Identification of synergies to promote in favor of efficient use of nutrients - A projection of possible regulatory antagonisms to be resolved and avoid constituting a new regulatory layer.

The Farm to Fork strategy presented in 2020 by the European Commission aims to make the food system fair, healthy and
environmentally friendly in Europe. It is part of the Green Deal which aims to transform the EU into a modern, resource-
efficient and competitive economy.
food safety: the French today benefit from real food safety, supported by a broad system of labels (Appellation,
IPG, labels of origin) and health and quality controls among the most demanding in Europe.
Fertilization contributes
to
Fertilization, by supplementing the soil's supply of nutrients and removing limiting factors, is fundamental and essential for
agricultural production of quality and quantity. It thus actively contributes to the production on European territory of healthy
food in quantity, while maintaining a balance between the areas used for agriculture and natural spaces.

the dynamism and competitiveness of French agriculture: crops, whatever the type of agriculture (conventional,
conservation, organic, for human or animal food, etc.), require the supply of fertilizers, of organic and/or mineral.
French agricultural yields are today among the best in Europe;
Effective fertilization, reasonable in its contributions and adapted to each type of agriculture, therefore contributes to two
complementary issues:
UNIFA, the union of the plant fertilization industries, supports the goal of reducing nutrient loss and an integrated and
coherent approach to nutrient management. Faced with the challenges of environmental protection, food safety and reduction
of available surface areas, plant nutrition manufacturers are already engaged in a process of continuous improvement. This
is done both at the level of manufacturing processes (reduction of GHG emissions, integration of new sources for the
manufacture of fertilizers) and adaptation of their products to the needs of farmers and their challenges (fertilizer efficiency ,
technical fertilizer, etc.). Their role is therefore essential to achieve this objective.
-
Ultimately, the availability of these nutrients serves to guarantee sufficient and quality harvests.
-
In this context, the Farm to Fork strategy identifies the excessive presence of nutrients, particularly nitrogen and phosphorus,
in the environment as a significant source of air, soil and water pollution, with harmful impacts on biodiversity. and the climate.
The objective of reducing nutrient losses by at least 50% without deteriorating soil fertility has been set, with the consequence
of reducing the use of fertilizers by at least 20% by 2030.
Cultivated plants consume nutrients for their development and growth.
Fertilization contributes to plant growth and food autonomy in Europe
Contribution to reducing nutrient losses by 50% from the Farm to Fork Strategy
UNIFA's contribution to the "action plan for better nutrient
management" initiative
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Towards the recognition of an agronomic approach to limit losses
Reduction of nutrient losses: pursuing the best efficiency of fertilizers and agricultural
practices
In order to achieve the objectives of reducing nutrient losses, UNIFA members alert
The range of products and solutions from our industry aims to meet the needs of all agriculture in our territory and to limit losses in both production and use.
Furthermore, the arbitrary reduction of nutrient doses (nitrogen and phosphorus) without taking into account
the needs of the plants could lead to reductions in yields.
of the supply of mineral fertilizers on the scale of our territory and more broadly to the destabilization of the
sectors. This would lead in particular to the importation of products with standards that are less protective
for the environment (carbon leakage, imported deforestation, etc.).
Furthermore, the use of the method of the French Committee for Studies and Development of Reasoned
Fertilization (COMIFER) makes it possible to adjust fertilizer inputs on the basis of agronomic assessments
and integrates new cultural practices such as the establishment legumes or the use of organic fertilizers.

this food security, while respecting soil fertility and farmers' income.
Given the diversity within the Member States of production methods, agriculture and advances in terms of
precision of fertilizer inputs, it will be essential to adapt the means to achieve the objective. In this respect,
France, by reasoning its inputs, has increased the efficiency of these fertilizer inputs as shown by the Nutritien Use Efficiency (NUE) indicator. It is therefore appropriate to have objectives per country taking
into account the efforts and improvements already made.
Setting a fertilizer reduction target could lead to the reduction, or even disappearance,
Mineral and organic fertilizers, amendments and biostimulants are complementary. By adapting a vision of
fertilization over the year and crop rotations, rational fertilization allows savings in fertilizer inputs.
would undermine French production potential, UNIFA members are instead calling for an approach based
on better use of fertilizers and agricultural practices. To this end, an objective of reducing nutrient losses by
50% set by the Farm to Fork strategy seems to us to be more likely to respond to environmental challenges.
Reasoned fertilization: at the heart of the reasoning of contributions
on the importance of carrying out agronomic reflection and not following an approach based on a dose
reduction objective.
Opposed to setting a numerical objective which would not take into account the evolution of practices and
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Simple and compound mineral fertilizers, particularly based on phosphorus or potash, fully contribute to the good management of fertilization by providing elements that are not available to plants. Their varied formulation adapts to the different needs of the numerous agricultural productions present in our
territory.
As explained above, reducing fertilizer doses would not meet the challenges of reducing nutrient loss and food security. In addition, soil phosphate reserve thresholds are low and reductions in supply seem
difficult to envisage without compromising crop yields. However, it is possible to improve the efficiency
of nitrogen and phosphate intake by combining it with biostimulants.
quality and meeting environmental standards. These products, from the circular economy,
water, temperature, soil condition, etc.).
Nitrogen nutrition is at the heart of the protein challenges of French and European agriculture. It contributes to the nutritional value of cereals and the protein content of French wheat. To respond to environmental issues (water, air, soil) and the reduction in available surface areas, UNIFA and its members are promoting better fertilizer efficiency by increasing the share of nitrogen absorbed by crops and by limiting losses, particularly of ammonia.
Fertilizer producers also have a role to play. Organic and organo-mineral fertilizers adapt to the needs of different types of agriculture by offering quality products.
Mineral fertilizers: an essential link in food security
Biostimulants complement fertilizers and amendments by contributing to better nutrition and plant vigor.
Indeed, they promote the uptake of nutrients by plants, promote the assimilation of water and contribute
to protection against abiotic stress (set of physicochemical factors having an influence on the cultivated
ecosystem –
Organo-mineral and organic fertilizers meet the needs of agriculture, particularly organic

Use of biostimulants, life stimulators and protectors against abiotic stress
The development of the supply and use of biostimulants, alone or combined with fertilizers, therefore constitutes a means of limiting nutrient losses.
The development of technologies at product level contributes to the efficiency of mineral fertilizers: coated fertilizers, drip fertilizers, assimilable soluble fertilizers, combinations between fertilizers, approved technological additives improving the efficiency of one or more nutrients.
make it possible to support the valorization of co-products or by-products and the development of Organic Agriculture.
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Correcting soil acidity provides multiple benefits. Well chosen and provided in the right quantity by the
practice of liming based on soil analysis, basic mineral amendments
- Levers at the plot scale: cultural practices (crop rotation, burial practices, soil analyzes to adjust the doses of nutrients to be provided;

Amendments make it possible to modify the acidity of the soil in order to improve the assimilation of nutrients by plants and thus reduce losses. Indeed, with certain cultural practices, soils undergo acidification which disrupts their proper functioning: too much acidity reduces the release and availability
of nutrients, plant growth and the biological functioning of the soil. Without optimal conditions, crop yield and quality are reduced.
Additional levers available for better fertilizer efficiency and limiting losses
Correct soil acidity using amendments
- Varietal selections.
Thus, liming is an essential support tool to combine agronomic efficiency and environmental preservation.
the heterogeneity of plots by using, for example, drones, imaging tools, GPS, rental of etc. ;
correct soil acidity (to bring the pH between 6.5 and 7) and act positively on the biological, physical and
chemical properties of the soil. Liming also contributes to other environmental benefits: development of soil life (bacteria, earthworms, etc.), structuring of the soil, reduction of nitrous oxide emissions, etc.
- Precision agriculture: modulation of nutrient intakes taking into account
Machine Translated by Google

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Belgium
Initiative
Nutrients – action plan for better management

ESPP (European Sustainable Phosphorus Platform) welcomes progress towards integrating EU nutrient policies, with the development of INMAP (Integrated Nutrient Management Action Plan). ESPP supports the Green Deal objective to reduce nutrient losses by 50% without deteriorating soil fertility, as fixed by the Farm-to-Fork and Biodiversity Strategies, in synergy with nutrient recycling. ESPP notes that the consultation web page and the roadmap introduction refer to food security and Circular Economy, both of which are today urgent in the context of the war in Europe. The war's devastation will impact world food production and food security. The conflict makes it urgent to reduce import dependency on the EU-listed Critical Raw Material 'Phosphate Rock' and on natural gas for nitrogen fertiliser production. The emphasis of INMAP must not only be to reduce nutrient losses (N and P losses to water, ammonia air pollution and nitrogen oxides climate emissions, as in the proposal) but also nutrient recovery and recycling, and sustainable and healthy diets. Dietary choices are a key driver of fertiliser use, of livestock production and of nutrient pollution, as well as of food security, INMAP should not be limited to water policy, climate change and Critical Raw Materials policies, but should include: • Social and economic support for sustainable diets, including ensuring that the EU does not "export" nutrient losses (e.g. via imported animal feeds) • Targets for nutrient recycling and for avoidance of nutrient losses in food waste and food processing, defined at EU, MS and regional levels • Integrating nutrient recycling into the revision of the Urban Waste Water Treatment and Sewage Sludge Directives, the Algae Initiative • Addressing regulatory barriers to nutrient recycling from animal by-products, whilst guaranteeing safety • Ensure that chemicals and pharmaceuticals policies reduce contaminants in nutrient flows and so enable safe recycling • Fiscal and market tools to monetarise environmental and social impacts of nutrient consumption and support nutrient recycling, including e.g. nutrient recycling in the EU Taxonomy for green investment funding, extension of carbon credits to nitrogen greenhouse gases. • R&I inc. nutrient flow data, demonstration projects • Social awareness of nutrient use, recycling, losses • Adapting the Common Agricultural Policy to monitor nutrient flows and to incentivise Nutrient Use Efficiency, optimised fertilisation, nutrient recycling and Nutrient BEMPs (Best Environmental Management Practices). Member State initiatives within the existing CAP will not be sufficient without such changes. ESPP notes that the COM document indicates the overall environmental costs of nitrogen pollution at 70 – 320 billion €/year, but that in fact

this covers only nitrogen. An estimate of costs of phosphorus losses is needed. ESPP suggests that INMAP should include an assessment of CAP to identify where policy changes may be needed to ensure achievement of the Green Deal nutrient loss reduction target (including "exported" nutrient losses), covering both EU policy and MS implementation plans. INMAP should fix the objective to reduce and then end EU import dependency for the CRM 'Phosphate Rock' and for natural gas for nitrogen fertiliser production, and should define and implement regulatory, fiscal and other policy actions to achieve this. See also ESPP's detailed proposals for INMAP 27_3_2021 at http://www.phosphorusplatform.eu/regulatory

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ESPP input for the EU's
"Integrated Nutrient Management Action Plan" (INMAP)

V27/3/2021 – page 2 of 13

One-page summary:

Action on nutrients is core to EU policy objectives

The development of an 'Integrated Nutrient Management Action Plan' (INMAP) is an action of the EU Farm-to-Fork Strategy (May 2020) and of the Circular Economy Action Plan (March 2020). Also, the Horizon Europe orientations aim to move the EU within planetary boundaries for nutrient flows.

Key pillars of INMAP should therefore be:

- reducing nutrient losses (Farm-to-Fork target)
- nutrient recycling (Circular Economy)
- R&I to support these objectives and to understand nutrient planetary boundaries and nutrient flows

ESPP suggests that INMAP should ensure synergy between nutrients and other key EU strategies:

- climate change
- sustainable and healthy diet (Farm-to-Fork strategy)
- water policy, including integrating nutrient recycling into the Sewage Sludge Directive
- Critical Raw Materials (phosphate rock, phosphorus)
- Specific policies: Methane Strategy (biogas), Emissions Ceilings Directive (ammonia), Algae Initiative, Aquaculture, Soil Strategy, chemicals and pharmaceuticals policies (reducing contaminants), etc.

ESPP's proposed priorities for integrated EU action on nutrients

- Climate change. Address links between climate change and increasing nutrient losses and eutrophication;
between nutrient losses and climate emissions.
- Dietary shift. Healthier, more sustainable diets will have lower climate impact and reduce nutrient use in
fertilisers and animal feed.
- Fiscal and market tools to monetarise the environmental and social impacts of nutrient consumption and
support nutrient recycling.
- Fix targets for nutrient recycling, defined at EU, Member State and regional levels.
- Integrate nutrient recycling into EU water policy and the Sewage Sludge Directive.
- Demonstration projects: nutrient recycling, optimising fertiliser use or animal or aquaculture feed, reducing
field nutrient losses …
- Synergies between nutrient recycling and biogas production, algae initiative.
- Address contaminants at source, to improve quality of sewage biosolids, manure and other secondary
nutrient streams, especially pharmaceuticals and veterinary medicines, microplastics, industrial and consumer
chemicals (especially PFAS/perfluorinated compounds, persistent plastics additives …)
- Common Agricultural Policy (CAP): key to implementing the Farm-to-Fork nutrient loss reduction target:
  - Improve Nutrient Use Efficiency (NUE) at farm level.
  - CAP FaST tool, mandatory, to ensure monitoring of nutrients, support NUE and reduce nutrient losses.
  - Incentives for nutrient efficiency, reducing soil erosion, climate, soil organic carbon, biodiversity.
  - Nutrient BEMPs (Best Environmental Management Practices): update knowledge, disseminate, implement.
  - Optimise fertilisation: management of organic fertilising materials (manures, organic fertilisers …), precision fertilisation, controlled delivery fertilisers, biostimulants.
- Data and science on nutrient flows, nutrient recycling and fertiliser LCAs, contaminant risk assessments
- Dialogue with stakeholders and industry, in particular farmers and advisory services and the food industry

How is INMAP specified in EU policy documents?

The development of an Integrated Nutrient Management Action Plan is specified in the Farm-to-Fork Strategy and the Circular Economy Action Plan, and is linked to the Horizon Europe orientations:

Farm-to-Fork Strategy

The EU Farm-to-Fork Strategy, COM(2020)381, 20th May 2020), states:

"The excess of nutrients (especially nitrogen and phosphorus) in the environment, stemming from excess use and the
fact that not all nutrients used in agriculture are effectively absorbed by plants, is another major source of air, soil and
water pollution and climate impacts. It has reduced biodiversity in rivers, lakes, wetlands and seas. The Commission will
act to reduce nutrient losses by at least 50%, while ensuring that there is no deterioration in soil fertility. This will reduce
the use of fertilisers by at least 20% by 2030. This will be achieved by implementing and enforcing the relevant
environmental and climate legislation in full, by identifying with Member States the nutrient load reductions needed to
achieve these goals, applying balanced fertilisation and sustainable nutrient management and by managing nitrogen and

phosphorus better throughout their lifecycle. The Commission will develop with Member States an integrated nutrient
management action plan to address nutrient pollution at source and increase the sustainability of the livestock sector.
The Commission will also work with Member States to extend the application of precise fertilisation techniques and
sustainable agricultural practices, notably in hotspot areas of intensive livestock farming and of recycling of organic
waste into renewable fertilisers. This will be done by means of measures which Member States will include in their CAP
Strategic Plans such as the Farm Sustainability Tool for nutrient management, investments, advisory services and of EU
space technologies (Copernicus, Galileo)."

Circular Economy Action Plan

The European Commission's EU Circular Economy Action Plan 11 th March 2020 includes "Food, water and nutrients" as
one of the seven key targeted value chains and specifies as actions to include:

• "develop an Integrated Nutrient Management Plan with a view to ensuring more sustainable application of
nutrients and stimulating the markets for recovered nutrients" including possible "reviewing directives on
wastewater treatment and sewage sludge and will assess natural means of nutrient removal such as algae".
• reduce food waste (as a key action of the Farm-to-Fork Strategy)
• facilitate water reuse
• continue the Bioeconomy Action Plan
• define a policy framework on compostable, biodegradable and bio-based plastics (ESPP comment: this is
important for digestates and composts)
• address microplastics and to better understand their risk and occurrence
• improve monitoring of resource recycling, proposing a "market observatory for key secondary materials", a
"Monitoring Framework for the Circular Economy" and "Indicators on resource use, including consumption and
material footprints"
• integrate the circular economy into Member States fiscal policies, via the European Semester

Horizon Europe

The Horizon Europe Orientations document states "A comprehensive EU policy to balance nutrient cycles is not yet
well developed. Research and innovation is needed to look at how the EU could move to living within the
planetary boundaries, with regards to nutrient flows."

ESPP's proposals for INMAP

Integration and implementation

An Integrated Nutrient Management Action Plan should

▲ address nutrients across all existing areas of EU policy (agriculture, environment, water, air, soil, industrial emissions, waste legislation, circular economy, food and diet, animal feed, fertilisers, raw materials, climate change, trade …).
▲ cover all plant nutrients: nitrogen, phosphorus, other nutrients (e.g. sulphur) and micro-nutrients which
can impact crop yield, and also soil organic carbon, which is linked to climate change and soil health.
Prioritise phosphorus and nitrogen, for which action will have significant benefits for the environment by 2030.
▲ integrate existing policy implementation structures (e.g. water basin management organisations,

agricultural and rural development funding, farm advisory services, Nitrates Committee, regional bodies
such as HELCOM …) in order to be implemented by companies and by local/regional territories.
Tools need to be defined and implemented to address the low market price of nutrients and the absence of a
monetarised price on nutrient environmental impacts (externalities), which combine to generally make nutrient removal and nutrient recycling "not economic". Such tools can include regulatory requirements,
nutrient reuse targets, incentives, and fiscal shifts.
More widely, food prices must integrate environmental protection and a fair income for farmers.
Integration across EU directorates
An EU Integrated Nutrient Management Action Plan should engage across EU services and policies:
- DG AGRI: CAP: nutrient management under cross-compliance with water policy, eco-schemes, mandatory FAST tool. Farm advisory services. Update of 'fact sheets' on nutrient BEMPs. EIP-AGRI: follow-up of EIP-AGRI Focus Group on Nutrient Recycling Horizon Europe R&D on nutrient management
and nutrient recycling. Inclusion of recycled nutrient products as authorised fertilisers for Organic Farming.
- DG ENVI: Circular Economy. Industrial Emissions Directive: resource efficiency and recycling in BREFs,
horizontal BREF on resource efficiency, resources efficiency and recycling in KEIs, BREF on large cattle
and aquaculture units. Site operating permits to accept secondary materials. Study into contaminants in
fertilisers (currently underway). Soil Strategy. Strategic Approach to Pharmaceuticals in the Environment.
EMAS BEMPs for agricultural nutrient management and nutrient loss mitigation. Water policy and Sewage Sludge Directive. Soil Strategy. LIFE: funding of nutrient recycling demonstration projects.
- DG GROW: Fertilising Products Regulation. REACH: art. 7(2), restrictions on problematic consumer/industry chemicals. Critical Raw Materials (phosphate rock). Circular Economy.
- DG ENER: Methane Strategy (biogas and digestate).
- DG MARE: Strategic Guidelines for EU Aquaculture, Algae Strategy
- DG RTD: Horizon Europe objective of "a comprehensive EU policy to balance nutrient cycles" and funding of research and recycling demonstration actions in Horizon Europe. Water4All Partnership. Mission Healthy Oceans, Seas, Coastal and Inland Water. Mission Soil Health and Food. Circular Bio-Based Europe Partnership. R&D into risk assessment of contaminants, especially pharmaceuticals, microplastics. R&D into nutrient management and climate change. Follow-up of COST 869: agricultural
nutrient BEMP fact sheets. Coordination actions with long-term perspectives.
- DG SANTE: Farm-to-Fork: dietary choices, nutrient footprinting and food product phosphorus-content
information, nutrient and nutrition content of food waste (with the food & beverage industry). Animal by-

products in the Fertilising Products Regulation. Recycling of phosphorus in Cat1 ABP ash. Recycled nutrients in Animal Feed Regulation.
- DG REGIO: Nutrient Circular Economy projects in Interreg A, B and C
- DG TRADE: Nutrient footprints of imported food, feed. Tariffs on imported food, feed not respecting EU
agricultural and nutrient sustainable production criteria.
- SecGen & DG ECFIN: European Semester: fiscal incentives for nutrient recycling, fiscal burden shift from
jobs to resource consumption, including in VAT policy.
Improve knowledge on nutrient flows

Data is already gathered for nitrogen emissions (because of links to climate change, Emissions Ceilings
Directive, Nitrates Directive) but substance flow analysis data (and data collection mechanisms) are lacking or insufficient concerning phosphorus (poorly monitored except for under water policy), concerning nitrogen recycling potential, and concerning integration with organic carbon and other nutrients and micronutrients1. Regionalised data on nutrient flows is rarely available, whereas this is important for developing recycling and for optimising action on nutrient losses, because there are significant
differences between regions and between Member States. Ongoing Horizon 2020 projects will contribute to
increase knowledge.
Data on nutrient content and fate of many nutrient-containing wastes and by-products is largely inadequate
to support development of recycling.
Nutrient footprinting of food products, data on nutrient content of food waste (not just "tonnage") are needed2
to support decision making.
Integrate existing data (e.g. on wastewater, environmental data, industrial emissions ...) and between nutrients (N, P, K, sulphur and other plant nutrients and micronutrients, and also soil organic carbon), including in particular coordination with data sets of EUROSTAT, EEA, FADN … Develop common metrics
and language (nutrient flows, loads, stocks) and tools to ensure understandability for decision makers and
stakeholders. Integrate data needs of EU policies: climate policy, Critical Raw Materials, CAP, Water Framework Directive, Sewage Sludge Directive and water policy, Circular Economy and Fertilising Products
Regulation, air policy and Emissions Ceilings Directive …
Data should be:
- user (management) orientated, in particular identifying hotspots and flows which can be targeted to reduce impacts, to reduce diffuse pollution at the farm level, to reduce primary resource consumption and to develop recycling
- recycling requires information on accessibility / usability (e.g. dilution), crop fertiliser value (e.g. of different livestock manures and secondary materials) and contaminants
- feasible to monitor and update to support policy decision making
- transparent and comparable across the EU
It is needed to develop, and agree between different industry sectors and across the EU, robust substance
flow analysis methods3 for nutrients, including calculations of nutrient use efficiencies, losses to water and to
air, taking into consideration regional agricultural practices, climate, etc.
This should be integrated into the Circular Economy Action Plan's proposed "Monitoring Framework for the
Circular Economy", "Indicators on resource use, including consumption and material footprints" and "market
observatory for key secondary materials".
In particular, develop pilot actions at the regional or catchment level to assess or implement integrated nutrient management at this scale, with the aim of reducing nutrient losses as foreseen in the
Farm-to-Fork strategy, and of meeting Planetary Boundaries4 for nutrients to the regional scale, including
"imported" nutrient footprints5.
The FaST tool at the farm level, if mandatory, will provide essential data for nutrient management, both at
the on-farm level, for water basin management and for EU policy makers.

Integrate nutrient management and climate change policies

Climate change is likely to accentuate land nutrient losses (especially through modified precipitation and increased storm runoff events, soil nutrient mineralisation) and to worsen eutrophication and harmful algal blooms (accentuated nutrient losses combined with increased temperatures, lower river flows during droughts). Climate change can also deteriorate crop Nutrient Use Efficiency6. However, nutrient losses and eutrophication will also accentuate climate change emissions, in particular aquatic methane emissions7 and in some cases CO2 efflux from surface waters. Ammonia emissions, for which manure is the greatest source, as well as other nitrogen losses from leaching and runoff, increase biogenic production of nitrous oxide.

Further research is needed to support policy action addressing links between climate change and nutrient losses / eutrophication, and between nutrient management and climate emissions, including in different climatic regions of Europe.

Food production is a key driver of climate change, and profound changes to diet and to how we produce food are necessary8. Moving to more sustainable diets and agriculture, with lower climate impacts, will require major changes in nutrient supply and management, and should enable considerable improvement of nutrient sustainability.

Improving management and recycling of organic wastes (manure, sewage biosolids, food waste …) can have significant climate benefits, in terms of reduced GHG emissions, as well as increasing SOC (soil organic carbon) and so carbon sequestration.

This is particularly true for manure, because of ammonia emissions. The Circular Economy Action Plan should aim to combine increased efficiency of nutrient recycling in livestock manures (use of manures adapted to crop uptake of both N and P, transfer of any regional surplus manure nutrients to crop-producing regions) and reduced manure GHG and ammonia emissions (Emissions Ceilings Directive). A broad range of approaches and technologies for improving manure nutrient management and nutrient recycling from manure should be further assessed, demonstrated and supported for implementation9, including:

• Overall on-farm nutrient efficiency and loss minimization: animal feed optimization, low emission (and welfare) animal housing, manure management and processing, nutrient application, crop and soil stewardship …

• Promotion of anaerobic digestion of manure and of digestate processing to valorise its energy potential and improve its nutrient use potential.

• Requiring the use of Best Available Techniques for manure storage, handling and application (e.g. acidification, injection application …).

• Processing of manure to performance, consistent, recycled organic fertiliser products with nutrient composition and release characteristics adapted to crop requirements, and to reduce ammonia, NOx and methane losses, including plasma treatment combining atmospheric nitrogen fixation with improved manure nitrogen fertiliser efficiency.

• Development of precision farming techniques for manure application and optimisation of application in combination with other fertilising products as a function of crop requirements

• ….

More targeted fertiliser nutrient management can contribute to a higher efficiency of nutrient and

especially nitrogen use, and thus contribute to reducing GHG emissions, especially N 2O emissions. Some nutrient recycling routes offer clear climate benefits, such as biogas production (nutrients in digestate), algae production using wastewater nutrients and CO2 trapping.
Further Life Cycle Analysis studies of different nutrient management routes and nutrient recycling technologies are needed, in order to assess long-term benefits including climate change impacts, contaminants, nutrient conservation, and to ensure sustainability of long-term investment decisions in manure, food waste and sewage biosolids management. These LCA studies should integrate the climate
impacts of composting, anaerobic digestion or pyrolysis (biochars), in particular concerning the form of
organics returned to soil, biogas production.

Nutrient management and biodiversity
Preservation of biological diversity is one of the key objectives of the Farm to fork strategy for sustainable
food in the European Green Deal10 and should particularly address farmland biodiversity and soil biodiversity, including the microbiological communities underground that guarantee soil health, productivity,
carbon sequestration and other, both known and untapped, ecosystem services. Nutrient recycling, from
manure and other organic materials, can help restore and maintain soil organic carbon which supports soil microbiological communities.
Insect and soil biodiversity are important in ensuring nutrient cycling in soil, so limiting losses to surface
waters and making nutrients available for crops11. Beetles have also been shown to reduce methane greenhouse gas emissions from manure pats12. Dung beetles and other insects can be negatively impacted by veterinary pharmaceuticals in manure13. Studies and risk assessments should be developed
to assess such impacts on insects of chemicals in manure, and appropriate risk reduction measures should
be engaged where impacts are identified.
Reducing nutrient losses from fields and ammonia emissions from manure will positively affect biodiversity in both terrestrial and aquatic environments. The EU Biodiversity Strategy (May 2020) states
“The Commission will promote the goal of zero pollution from nitrogen and phosphorus flows from fertilisers”
through the Key Commitment (n°10 of 14) and states (as in the Farm-to-Fork strategy) “The losses of nutrients from fertilisers are reduced by 50%, resulting in the reduction of the use of fertilisers by at least
20%.”
It is also important to note that the European Court of Justice judgements, concerning the Habitats Directive,
impact projects (such as housing construction, roads or airports) which would cause nutrient emissions
susceptible to deteriorate protected habitats14.
Nutrient recycling and organic carbon in water policy
Integrate the circular economy (nutrient recycling and resources recovery) into the EU Urban Waste Water Treatment Directive and into the Sewage Sludge Directive, including defining nutrient recycling objectives. Action should address: resource recovery monitoring, cost recovery for nutrient and
organic carbon recycling, synergies between nutrient recycling and nutrient removal (nutrient discharge
consents), synergy with biogas and energy recovery, ensuring safety of contaminants.
Prioritise in water policy and in the Sewage Sludge Directive, reduction at source of contaminants in wastewaters to detoxify nutrient cycles.

Reinforce actions to identify and reduce nutrient emissions from small settlements, isolated households and small livestock production farms in the Urban Waste Water Framework Directive and via the Water Framework Directive.
Recycling should first target phosphorus and organic carbon (either by return to soil or by energy recovery)
but nitrogen recovery and recycling should also be considered.
A wide range of different routes are today available for phosphorus recycling from sewage sludge, most of which are also applicable to other organic waste streams (manure, food industry wastewaters, food
waste digestate …) :
▲ use of appropriately treated sewage sludge on farmland (e.g. after anaerobic digestion and/or composting to ensure stability, avoid odour and remove pathogens), to supply nutrient needs of crops, so also returning organic carbon and micronutrients to soil. See "State of science on sewage biosolids"
update on use in agriculture, 2018, ESPP SCOPE Newsletter n°129
www.phosphorusplatform.eu/Scope129
▲ growing algae or plants (micro-algae, duckweed, willow trees, phragmites reeds …) which can fix nutrients into biomass which can then be processed or used in production of cosmetics or biofuels, energy production, fertilisers, animal feed …

▲ precipitation of phosphate salts from sludge dewatering liquors, e.g. struvite, vivianite
▲ recovery of ammonia salts from digestor gas stripping
▲ use of adsorbents to remove P and recycling either by release of the P from the adsorbent and regeneration (recovery as a phosphorus chemical) or use of the P-loaded adsorbent as a fertiliser (e.g. use of natural minerals or biological secondary materials as adsorbents15). Several recent science reviews of adsorbents are here www.phosphorusplatform.eu/Scope138
▲ pyrolysis / gasification of sewage sludge to recover energy, sanitise and produce a biochar or pyrolysis material which can be used directly as a fertiliser, or used as an active carbon for nutrient removal, before recycling
▲ chemical or thermochemical P-recovery from sewage sludge or sewage sludge incineration ash (e.g. Ash2Phos/EasyMining, Outotec AshDec, ZAR/Phos4Life, Pyrophos, Remondis…)
▲ use of sewage sludge incineration ash as a raw material in fertiliser production (adaptation of process to take ash as well as phosphate rock)
▲ electro-thermal reduction of sewage sludge or sewage sludge incineration ash to produce P4 (e.g. Italmatch/Recophos)
▲ innovative processes currently at the lab/pilot scale: electrolysis cells operating on sewage sludge or sludge ash, producing hydrogen and releasing phosphorus: ion exchangers …
Farm to Fork
Dietary choices are probably the biggest driver of nutrient use and of nutrient losses. Nonetheless, improvements can be made at farm level, if EU farmers are incentivised and equipped with effective tools
(FaST, precision farming, advanced fertilizing products, better information on nutrient content of manure and
slurry).
The Farm to Fork Strategy should fix overall EU objectives to improve Nutrient Use Efficiency (NUE)
in the EU by 2030, for nitrogen and for phosphorus, to be adapted at national/regional level and or by crop
type/agricultural sector, because farm conditions vary within the EU. This will ensure that phosphorus and
nitrogen are more effectively taken up by the plants, while losses to the environment will be decreased and
crop and livestock productivity will be maintained/increased. This will contribute to securing a profitable
business model for farmers.

Improving Nutrient Use Efficiency requires a range of actions, which will also reduce nutrient losses, in
particular:
• Improve data on farm and field level nutrient balances (the FaST tool in CAP is critical);
• Continue to develop efficient fertilisers (e.g. controlled release, foliar, …), biostimulants, precision fertilisation methods, nutrient-efficient agronomic practices …
• Improve data, understanding and implementation on nutrient-efficient application of manures and other nutrient-rich secondary materials and of organic fertilisers.
Development of nutrient footprinting of diets and of food products should be furthered16, engaging the
food industry17 and retailers. Address the nutrient and nutrition content of food waste, rather than just the
tonnage.
Work on information on phosphorus content of food products with the food industry: this can vary widely in processed foods18 and is extremely important19 for kidney disease patients (CKD) - that is maybe
around 30 million persons in Europe20.
Engage with DG SANTE to facilitate nutrient recycling from animal by-products, including Cat1 ABP
incineration ash, without compromising health and safety, whilst respecting the waste hierarchy (consumer less, reduce losses, reuse in human food chain, animal feed, fertiliser, energy valorisation). This
must take into account the current Covid media backlash, where recycling of animal by-products and BSE
may be imagined to represent "the same dangers as eating bats".
Nutrient efficiency of animal feed must be addressed, including in aquaculture and aquaponics (both open
water and land-based systems).

Healthy Oceans, Seas, Coastal and Inland Water
Eutrophication, leading to ecosystem unbalances, toxic algal blooms and anoxic zones are an increasing threat to inland waters, coastal ecosystems and oceans ('dead zones'), and are linked to climate emissions. As Commissioner Vella indicated, the Horizon Europe Mission Healthy Oceans, Seas,
Coastal and Inland Water should take eutrophication as one of the key challenges to improve the outlook of
aquatic ecosystems.
Promotion of consumption of currently under-valued fish species21, in particular those which feed on zooplankton22, can contribute to limiting eutrophication impacts, provide sustainable protein, generate local
jobs, and offer a route to effectively recycle nutrients back from eutrophic lakes, rivers or seas to the food
chain.
Agriculture
A critical priority is implementation of the proposed CAP FAST tool23 (Farm Sustainability Tool for Nutrients) for all farmers across Europe, as an obligatory condition for CAP funding, as well as inclusion
of sustainable nutrient management as a key pillar of Farm Advisory Services to be established in the EU
Member States. These actions to improve farm nutrient use should be integrated with support to farmers
for nutrient circularity and recycling.
Update knowledge on long-term effectiveness, cost and feasibility of nutrient-loss mitigation actions, in different farming systems (e.g. buffer strips, retention ponds, no-till, crop rotation – crop diversity and inter-

cropping …), and updating of online fact sheets and other tools for communicating this information to farmers, agricultural outreach services and to water basin managers (c.f. update from COST Action 869
which terminated in 201124). This should be coordinated with EMAS BEMPs25 (Best Environmental Management Practice) for agricultural nutrient management.
Manure management is a key factor in agriculture nutrient sustainability: there is more phosphorus in manures in the EU than is used annually in mineral fertilisers26, and manure is an important source of nitrogen emissions.
Improved nutrient management should be included in the update of EU aquaculture policy27, including
reduction of nutrient footprint of feed materials, improving feed nutrient use efficiency, reducing nutrient
losses and developing recovery and recycling of nutrients in discharges.
Follow-up should be ensured of conclusions of the EIP-AGRI Focus Group on Nutrient Recycling28: LCA,
Nutrient Use Efficiency assessment methods29, organic contaminants (impacts, mitigation), perception and
acceptance of recycled nutrients, remote sensing to support precision fertilisation using biobased fertilisers,
on-farm techniques for nutrient recovery and for measuring nutrient content in manures, production of recycled nutrient products adapted to specific crops and with reliably consistent composition.
The question of nutrient use and losses in biofuels should be specifically addressed, including for phosphorus: phosphate fertiliser needs for biofuel crop production, resulting phosphorus resource consumption and losses to surface waters, possibilities for recycling phosphorus from biofuel production
(preferably to animal feed, or if not to fertiliser).
Address contaminants
Contamination of secondary resources of nutrients and of organic carbon flows are obstacles to recycling, because of costs of depollution or consumer rejection. Reduction at source of contaminants should be engaged as an active priority. In particular, contaminants in municipal wastewater are an obstacle to agricultural valorisation of composted or digestated sewage biosolids. Levels
of veterinary pharmaceuticals, copper and zinc in manures are also a problem.
Pharmaceuticals and veterinary pharmaceuticals:
- reduce pharmaceuticals contamination at source of sewage and manures, improve biodegradability30
- risk assessment for pharmaceuticals in biosolids used in agriculture

- risk assessment for veterinary pharmaceuticals found in manure (impact on dung beetles, soil bacteria …)
- R&I into removal of pharmaceuticals in composting and in anaerobic digestion
Microplastics:
- already being addressed by ECHA for deliberately produced microplastics
- addressed in the Circular Economy Action Plan31
- reduction at source should be implemented where possible
- develop and render obligatory plastics which are fully biodegradable in sewage works and in the environment
- R&I into whether microplastics in biosolids and other recycled nutrient flows (e.g. food wastes) pose health
or environmental risks
Consumer / industrial chemicals:
- where chemicals are identified as posing obstacles to biosolids valorisation, they should be fast-tracked for
REACH restriction (cf study currently underway for DG ENVI32)

- priorities to address should be perfluorochemicals (PFAS33 and related chemicals), halogenated flame
retardants and other halogenated industrial chemicals (including chlorinated paraffins and naphthalenes)34

Fiscal and market tools

The market for recycled nutrient products is often not “economic”, because recycling (relatively small scale
processing, contaminants and safety requirements, decentralised logistics) is often more costly than primary
fertilisers, and because the EU regulatory and fiscal framework does not monetise environmental or social
benefits such as pollution abatement, soil preservation, primary resource savings, local job creation ….

However, the EU trade balance for key nutrients (N, P, K) is negative35 and a significant part of these nutrients is lost to the environment.

Monetisation of external environmental and social costs (True Costing) for nutrient use, nutrient losses
and nutrient recycling should be a priority, through fiscal, market price or other mechanisms. Financial
balance mechanisms should ensure that, overall, farmers are not penalised.

Tools to support markets for secondary nutrients should be tested to avoid unintended impacts, and implemented across the EU to avoid market distortion, in cooperation with Member States (c.f. European
Semester, see IEEP proposals 202036). These should combine: price-based instruments (e.g. subsidy or
tax), rights- or quantity-based instruments (tradable permits and certificates) and market friction instruments
(information) in order to be effective:

- Rewarding farmers for practices which maintain or increase carbon storage in soils and for sustainable nutrient balances as part of the CAP, in coherence with mandatory FaST tool;
- Market support tools: e.g. modulated VAT to support fertilisers with recycled nutrient content, ecotaxes or resource import taxes which favour sustainable fertiliser production. Income from nutrient fiscality should be used to support recycling and returned to farmers, so that net overall impact for agriculture is not financially penalising;
- Transfer of taxes and contributions from jobs (social contributions, VAT) to ecotaxes on resources and on nutrient emissions;
- If imported products (fertilisers, animal feed, food products …) are not subject to the same sustainability constraints or ecotaxes, then this must be compensated by import taxation (this should include food products or feed crop if grown by farmers not subject to the same sustainability constraints as in Europe);
- Definition of recycled nutrient content objectives coherent with implementation of recycling technologies able to reliably deliver corresponding quantities conform to quality and safety requirements;
- Integration of nutrient recycling into Public Procurement37;
- Development of nutrient emissions trading to improve cost-effectiveness of water policy objectives, in particular between waste water treatment and agriculture, including development of nutrient certificates / nutrient credits;

- Communications, via nutrient footprints on food products, in cooperation with the food & beverage industry;
- Studies of environmental and social costs of nutrient losses and benefits of nutrient recycling, in order to support fiscal policies aiming to internalise these externality costs and benefits;
- Nutrient recycling objectives at national and/or regional levels.

A Circular Economy Directive with clear objectives to be achieved by member states (similar to REDII for

energy) could provide a consistent and obligatory framework for CE policies.
Support nutrient stewardship and recycling demonstration sites
Under Horizon Europe, Interreg, LIFE, support test and demonstration actions for nutrient footprinting,
nutrient stewardship and nutrient recycling.
Include nutrient recycling, including developing, extended field testing and taking to market of recycled
nutrient products in the Circular Bio-Based Partnership38.
Policies and tools developed and implemented by European cities (Helsinki, Amsterdam and many others)
should be evaluated for their potential of upgrading to EU policies39.
End-of-Waste and other regulatory obstacles
The new EU Fertilisers Product Regulation 2019/2009 (FPR) will resolve significant regulatory obstacles to
nutrient recycling, on condition that the proposed STRUBIAS40 annexes are adopted, with not only the CE-
mark but also End-of-Waste. This will open the market both for secondary nutrient products, and also for
nutrient recycling technologies.
• Additional materials need to be assessed for inclusion in annexes, or clarification of their status, in particular: recovered nitrogen and potassium salts from gas cleaning, algae and other biomass grown as wastewater treatment, insect frass41, fish manure, Cat1 animal by-product incineration ash …
• The annex for animal by-products needs to be prepared (CMC10)
• The annex (CMC11) for by-products needs to be developed (underway), both for organic and inorganic materials
However, regulatory obstacles (in particular End-of-Waste) need to be clarified for sectors other than fertilising products:
• Use of sewage sludge or animal by-product incineration ash, after chemical processing, to produce animal feed additives42, with removal of contaminants and guaranteeing safety,
• Non-fertiliser products recovered from municipal wastewaters,
• Non-fertiliser products recovered from flue gas cleaning and ash, including from municipal solid waste
incineration.
Specific secondary material streams form wastewaters (for specified use destinations), should be included in
the priority material streams for assessment of possible EU End-of-Waste criteria.
A temporary “proof of concept” permitting regime should be instigated, to allow start-up of new recycling
processes at an initial limited scale, with appropriately adapted safety and risk assessment and documentation.
Companies wishing to replace primary raw materials by secondary materials can face permitting problems if
the secondary material is “waste”43. Coordination of national permitting authorities, and transfer of experience, could facilitate such re-permitting to facilitate use of secondary materials.
The proposed update of the Industrial Emissions Directive44 should better integrate recycling, as a part
of resource efficiency objectives: use of secondary raw materials in production, recovery of materials in
processes, and recycling of waste or by-product streams. This should integrate nutrients, and should particularly target the EU Critical Raw Material “phosphate rock”. Resource efficiency and recycling, including
nutrients, should be integrated into the Key Environmental Indicators (KEIs) for BAT45.

Cattle farms, other livestock production and aquaculture, above certain size limits, should be integrated into

the BREF46 for “intensive rearing of poultry or pigs”.
Also, the application of REACH art. 2(7) “recovered” substances needs to be clarified. This article is important to facilitate recycling, which often takes place in small, distributed sites owned by organisations not
accustomed to chemical regulations (e.g. local authorities for sewage works) so that REACH Registration of
each producer and site would prevent implementation. However, the exoneration from Registration means
that there is no obligation to share costs for the REACH dossier preparation, management and updates47.
Also, recycled nutrient materials adapted to the principles of Organic Farming48 should be authorised for
use in Organic Farming, starting with struvite and calcined phosphates recovered from municipal wastewater
(EGTOP Opinion of 2/2/2016).
Importance of value-chain stakeholder dialogue
Facilitate dialogue through value-chains, including farmers and agricultural advisory services (nutrient users),
recycling and waste valorisation industries, chemical and fertiliser industries (in particular, organic fertilisers
which today lack European industry coordination), regional strategy organisation (e.g. HELCOM), regulators, consumers.
At the EU level (e.g. via EIP-AGRI), a data-base of recycled nutrient materials and organic fertilisers, both generic and company-specific, should be established, including agronomic trial data and farmer experience, in order to build farmer confidence, provide information and promote success stories. To be
meaningful, this needs long-term engagement and funding, both from policy makers and from relevant
industries and stakeholders, and not a temporary “project” approach.
Commission actions to support stakeholder dialogue should ensure cooperation with industry federations
and with existing platforms functioning with industry engagement and not undermine these with exogenous
or temporary (project lifetime) funding.
In particular, the European Commission should engage with the food and beverage industry on nutrient footprinting, food product phosphorus content information, nutrition and nutrient content of food waste.
11 See conclusions of the DONUTSS workshop (Data on Nutrients to Support Stewardship), 2015 www.phosphorusplatform.eu/eNews117
2 See e.g. http://wp.lancs.ac.uk/rephokus/
3 http://www.oecd.org/cfe/regional-policy/Ekins-2019-Circular-Economy-What-Why-How-Where.pdf
4 https://www.stockholmresilience.org/research/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-
boundaries.html
5 https://www.footprintnetwork.org/our-work/ecological-footprint/
6 See SCOPE Newsletter n° 137 summarising current scientific understanding of links between nutrient losses to surface waters and
nutrient management, climate change, eutrophication and crop Nutrient Use Efficiency at https://phosphorusplatform.eu/scopenewsletter
7 See SCOPE Newsletter n° 135 summarising current scientific understanding of links between nutrients and aquatic methane
emissions at https://phosphorusplatform.eu/scopenewsletter
8 FAO, 2018, Chair’s Summary. 2nd International Symposium on Agroecology Scaling up agroecology to achieve the Sustainable

Development Goals http://www.fao.org/family-farming/detail/en/c/1192634/
9 SuMaNu recommendations for best applicable handling technologies for storage and spreading of manure 2021
https://balticsumanu.eu/userassets/uploads/2020/12/FINAL-DRAFT-Support-and-regulation-for-best-applicable-handling-
technologies-POLICY-BRIEF.pdf and RiSE (E. Sindhöj et al.) review of several projects on manure management 2020 http://ri.diva-
portal.org/smash/get/diva2:1476430/FULLTEXT01.pdf
10 https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en - https://ec.europa.eu/food/farm2fork_en
11 Losey et al. 2006 https://doi.org/10.1641/0006-3568(2006)56[311:TEVOES]2.0.CO;2 - Finch et al (2020)
https://setac.onlinelibrary.wiley.com/doi/abs/10.1002/etc.4671 - See also http://www.dungbeetlesforfarmers.co.uk/information-for-
farmers
12 Quantifying Beetle-Mediated Effects on Gas Fluxes from Dung Pats, A. Penttilä et al., PLoS ONE 8(8): e71454
https://doi.org/10.1371/journal.pone.0071454

13 Implications of Endectocide Residues on the Survival of Aphodiine Dung Beetles: A Meta-Analysis, D. Finch et al., Environmental
Toxicology and Chemistry—Volume 39, Number 4—pp. 863–872, 2020
https://doi.org/10.1002/etc.4671
14 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:62017CA0293
15 E.g. FILTRAFLOTM -P crab carapace-based P-adsorbent
https://www.nweurope.eu/media/12161/phos4you_p-rich_biomass_en_nov2020.pdf
16 Integrating the work underway at JRC with the Gothenburg TFRN (Task Force on Reactive Nitrogen) and “Footprint Family” project
17
http://www.fooddrinkeurope.eu/uploads/publications_documents/FoodDrinkEurope_Product_Environmental_Footprinting.pdf
18 Dietary Phosphate and the Forgotten Kidney Patient: A Critical Need for FDA Regulatory Action, M. Calvo, R Shermann & J. Uribarri,
Am J Kidney Dis. April 2019, vol. 73, Issue 4, pp. 542–551 https://doi.org/10.1053/j.ajkd.2018.11.004
19 “Re-evaluation of phosphoric acid–phosphates – di-, tri- and polyphosphates (E 338–341, E 343, E 450–452) as food additives and
the safety of proposed extension of use”, EFSA Panel on Food Additives and Flavourings (FAF), adopted 4th June 2019, EFSA
Journal 2019;17(6):5674 www.efsa.europa.eu/en/efsajournal/pub/5674f
20 Estimate based on the indication of 10% of the population by EFSA 2019 (reference above) or 7% of the population by Ketteler in
“Clinical aspects of natural and added phosphorus in foods”, Humana Press (Springer), 260 pages, 2017, editors O. Gutiérrez, K.
Kalantar-Zadeh and R. Mehrotra www.springer.com/us/book/9781493965649
21 See e.g. Järki Särki project, developing valorisation of roach in the Baltic https://www.jarkisarki.fi/#!home/bqldb
22 zooplankton are the aquatic “grazers” which can naturally control algal blooms, e.g. daphnia
23 https://phosphorusplatform.eu/scope-in-print/enews/1826-enews031#_Toc2766002
24 EU COST Action 869 “Mitigation options for nutrient reduction in surface water and groundwaters” http://www.cost869.alterra.nl –
ended 2011
25 EMAS Commission Decision (EU) 2018/813 of 14 May 2018 “Best environmental management practices, sector environmental

performance indicators and benchmarks of excellence for the agriculture sector" https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018D0813
26 Van Dijk et al. "Phosphorus flows and balances of the European Union Member States", Science Total Environment 2016 http://dx.doi.org/10.1016/j.scitotenv.2015.08.048
27 Strategic Guidelines for EU Aquaculture Update (DG MARE – Unit A2), Roadmap open to consultation to 21/4/2020 https://ec.europa.eu/info/law/better-regulation/
28 https://ec.europa.eu/eip/agriculture/en/focus-groups/nutrient-recycling
29 c.f. EU Nitrogen Expert Panel www.eunep.com
30 c.f.: EU "Strategic Approach to Pharmaceuticals in the Environment"
31 COM(2020)98, $3.4 addresses both intentionally produced and unintentionally generated microplastics
32 "Contaminants in fertilisers": Assessment of the Risks from their Presence and of the Socio-economic Impacts of a Possible Restriction under Reach" https://etendering.ted.europa.eu/cft/cft-display.html?cftId=5131
33 PFAS is being addressed as a priority under the EU Chemical Strategy towards a Toxic-Free Environment, see COM document on PFAS (per- and polyfluoralkyl substances) SWD(2020)249, 14th October 2020 https://ec.europa.eu/environment/pdf/chemicals/2020/10/SWD_PFAS.pdf
34 UK Water Industry Research Report 18/SL/01/9 (2018) ISBN 1 84057 864 5 "Biosolids to market – a strategic proposal to explore the threats to biosolids to land – now and in the future" https://ukwir.org/biosolids-to-market-a-strategic-proposalto-explore-the-threats-to-biosolids-to-land-now-and-in-the-future-sl-850/sl-1072-sl-1060-combined-0
35 See graph fig. 4 in https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/market-brief-fertilisers_june2019_en.pdf
36 "Delivering the Green Deal: the role of a reformed European Semester within a new sustainable economy strategy", IEEP, C. Charveriat & E. Bodin, 2020 https://ieep.eu/publications/role-of-a-reformed-european-semester-within-a-new-sustainable-economy-strategy
37 https://ec.europa.eu/info/policies/public-procurement_en
38 https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2019-4972449/public-consultation_en
39 https://www.oecd.org/cfe/regional-policy/Wijkman-2019-Circular-Economy-Cities-Requires-Systems-Approach.pdf
40 STRUBIAS : precipitated phosphate salts & derivates, thermal oxidation materials & derivates and pyrolysis & gasification materials" http://dx.doi.org/10.2760/186684
41 Insect excreta, exoskeletons, un-eaten feed substrate, from insect production https://en.wikipedia.org/wiki/Frass
42 see: Animal Feed Marketing and Use Regulation 767/2009: art. 6.1 and Annex III 1.1 and 1.5
43 Example: fertiliser factories wishing to replace phosphate rock as input material by sewage sludge incineration ash
44 Consultation open to 21/4/2020 https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12306-EU-rules-on-industrial-emissions-revision
45 http://eippcb.jrc.ec.europa.eu/reference
46 https://ec.europa.eu/jrc/en/news/new-eu-environmental-standards-large-poultry-and-pig-farms
47 Currently the struvite REACH dossier no longer has an active Lead Registrant, is inadequate, and needs updating: read-across is

used for acute oral and dermal toxicity and ‘in vitro’ for eye irritation, whereas this not applicable for these end-points for inorganic
phosphates; there are other technical problems with the dossier; newly available data must legally be added to the dossier (since
2013).
48 Regulation 2018/848 (replaces 834/2007) art.5(c) specifies as a “general principle” of Organic Farming “the recycling of wastes and
by-products of plant and animal origin as input in plant and livestock production”

Feedback reference
F3250257
Submitted on
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Submitted by
Erik MEERS
User type
Academic/research Institution
Organisation
Ghent University - Lead Partner H2020-NUTRI2CYCLE
Organisation size
Large (250 or more)
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

Nutri2Cycle urges the European Commission to address the anachronistic requirements of the Nitrate Directive and allow digestate and recovered fertilizers to actively reduce the utilisation of chemical fertilisers, effectively closing the nutrient loop and enabling carbon storage. Nutri2Cycle is concerned that the Nitrates directive makes no distinction and defines livestock manure under article 2(g) as: “waste products excreted by livestock or a mixture of litter and waste products excreted by livestock, even in processed form”. This implies that all digestate from animal manure origin retains the status of animal manure in spite of its new “processed form” which increases nutrient use efficiency. The Nitrates Directive in its current form is based on the same definitions and wording (including Art. 2(g)) and does not take into account three decades of research & innovation and the technical advancement that allows manure refinery (a.o. via anaerobic digestion as key enabling technology) into fertilizing products that can act as technical alternatives to synthetic chemical fertilisers produced based on fossil resources (in casu, natural gas used to produced N synthetic fertilisers using the Haber-Bosch chemical process). The land application of organic materials needs to be carefully managed to maximize their crop available nutrient value and minimize their impact on the wider environment. Studies demonstrate that NH3 emissions are on average lower for digested than untreated slurry due to a lower dry matter contents that increase the infiltration rate. N2O losses are also generally lower when using digestate rather than raw slurry. (see attachment for the more elaborate description)

This project has received funding from
the European Union’s Horizon 2020
research and innovation programme
under gran agreement No 773682.
NUTRIENTS ACTION PLAN FOR A BETTER MANAGEMENT
26/04/2022
CALL FOR EVIDENCE REPLY
Nutrients – action plan for better management
H2020 Project Nutri2Cycle welcomes the European Commission’s commitment to draw up an integrated nutrient
management action plan to help reduce nutrient losses by at least 50%, reducing the use of fertilisers by at least 20%.

while ensuring that there is no deterioration in soil fertility and stimulating the market for recovered nutrients. An integrated nutrient management plan should adopt a systemic approach, tackling misalignments with the Circular economy actions Plan. Currently, the use of mineral nitrogen (N) fertilizers in the European Union (EU) agricultural sector corresponds to 10.2 million tons of N consumed in 2018, increased compared to 10 years before. Mineral fertilizers are energy intensive; with synthesis of NH3, based on the Haber-Bosch process being responsible for about 2% of the world's energy consumption and 2.5% of the global fossil-fuel-based carbon dioxide emissions.1

The concept of a circular economy highlights the importance of nutrient recovery, and aims at preventing environmental impacts such as soil acidification and eutrophication of water bodies, and release of greenhouse gases (GHG). The Fit for 55 includes EU-wide binding targets to cut GHG emissions by at least 55% and increase the share of renewable energy by at least 40% in the final consumption by 2030. Anaerobic digestion (AD)—which produces renewable power, heat, and fuel from organic waste—will to play a key important role in achieving the goals. However, AD will also play a crucial part in the sustainable management of organic waste streams such as manure by simultaneously providing renewable energy, closing nutrient loops, and reducing GHG emissions. Digestate, a co-product of biogas production used as organic fertiliser, has the potential to transform Europe's agricultural sector offering an alternative to commonly used chemical fertilisers. such as nitrogen, are fully preserved in the AD process.

The adoption of the new Fertilising Products Regulation (FPR) ((EU) 2019/1009) includes organic and waste-derived fertilisers under the EU internal market. However, FPR is a product regulation and in itself does not consider limitations or constraints on product application. More specifically, under the current definitions of the Nitrates Directive, those products derived from processed manure retain the legal status of animal manure, including the restrictions that come with it such as the current limit of 170 kg N ha−1 y−1 in Nitrate Vulnerable Zones applies to any fertilising product derived from livestock manure. Consequently, this threshold negatively impacts the use of bio-based fertilising materials such as digestate based on (co-)digested animal manure, although this often bears no resemblance to the manure from which their nutrients were extracted, as they can contain high amounts of mineral N (Nmin), effectively bringing them closer to chemical fertilisers in terms of plant nutrient uptake. As regulation was not updated with the latest technical advancements, farmers tend to top up with energy-demanding chemical fertilisers as a result of the 170 kg N

1 Saju et al (2022) Applied Sciences | Free Full-Text | Digestate-Derived Ammonium Fertilizers and Their Blends as Substitutes to Synthetic Nitrogen Fertilizers (mdpi.com)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under gran agreement No 773682.

ha−1 y−1 limit not meeting most crop requirements.2
Nutri2Cycle urges the European Commission to address the anachronistic requirements of the Nitrate Directive and
allow digestate and recovered fertilizers to actively reduce the utilisation of chemical fertilisers, effectively closing the
nutrient loop and enabling carbon storage. Nutri2Cycle is concerned that the Nitrates directive makes no distinction
and defines livestock manure under article 2(g) as: “waste products excreted by livestock or a mixture of litter and waste
products excreted by livestock, even in processed form”. This implies that all digestate from animal manure origin
retains the status of animal manure in spite of its new “processed form” which increases nutrient use efficiency. The
Nitrates Directive in its current form is based on the same definitions and wording (including Art. 2(g)) and does not
take into account three decades of research & innovation and the technical advancement that allows manure refinery
(a.o. via anaerobic digestion as key enabling technology) into fertilizing products that can act as technical alternatives
to synthetic chemical fertilisers produced based on fossil resources (in casu, natural gas used to produced N synthetic
fertilisers using the Haber-Bosch chemical process). The land application of organic materials needs to be carefully
managed to maximize their crop available nutrient value and minimize their impact on the wider environment. Studies
demonstrate that NH3 emissions are on average lower for digested than untreated slurry due to a lower dry matter
contents that increase the infiltration rate. N2O losses are also generally lower when using digestate rather than raw
slurry.3
Moreover, the role of digestate as a contributor to SOC build up should be considered4: organic matter in digestate can
build up the humus content in the soil; this is a benefit unique to organic fertilisers which is particularly crucial for arid
and semi-arid lands with low carbon content.5
About Nutri2Cycle: The Nutri2Cycle project will be running between 2018 and 2023. The Nutri2Cycle project assesses the current
Nitrogen (N), Phosphorus (P) and Carbon (C) flows looking into existing management techniques in different farms across Europe and
analysing their related environmental problems.
Project partners: Universiteit Gent, Universita Degli Studi di Milano, Politechnika Czestochowska, United Experts, Fundación Cartif,
Johann Heinrich Von Thuenen-Institut, Soltub, Trade And Service Providing Limited Liabilty, Stichting Wageningen Research, Instituto
Superior de Agronomia, Kobenhavns Universitet, Terra Humana, Chambre Departementale d’Agriculture, Zuidelijke Land- En
Tuinbouworganisatie Vereniging, Institut de Recerca i Tecnologia Agroalimentaries, Teagasc - Agriculture And Food Development
Authority, European Biogas Association, Ips Konzalting Doo Za Poslovne Usluge, Inagro, Consorzio Italbiotec.
Contact: Erik Meers, Coordinator of Nutri2Cycle – erik.meers@ugent.be
2 Reuland et al (2021) Agronomy | Free Full-Text | The Potential of Digestate and the Liquid Fraction of Digestate as Chemical Fertiliser Substitutes
under the RENURE Criteria | HTML (mdpi.com)

3 Gaseous Nitrogen Emissions and Forage Nitrogen Uptake on Soils Fertilized with Raw and Treated Swine Manure - Chantigny - 2007 - Journal of
Environmental Quality
4 Reuland et al. (2022) Agronomy | Free Full-Text | Assessment of the Carbon and Nitrogen Mineralisation of Digestates Elaborated from Distinct
Feedstock Profiles | HTML (mdpi.com)
5 Digestate-paper-final.pdf (europeanbiogas.eu)

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Submitted by
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Organisation
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Organisation size
Medium (50 to 249 employees)
Country of origin
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Initiative
Nutrients – action plan for better management

The increasing use of industrial processes has led to an accumulation of nitrogen and phosphorus in particular in aquatic and terrestrial ecosystems and in the atmosphere. These anthropogenic forms of nutrients in inorganic form exceed the natural purification capacities of air, water and soil. This produces a major imbalance in the overall nitrogen balance and poses growing environmental problems. This massive anthropogenic contribution to the stock of inorganic nitrogen is coupled with a loss of more than 50% of the nitrogen added in fertilization. The cross-border nature, perennial and deeply linked to human agricultural and industrial activities, make nutrient management a pressing issue that the European Union must face. The actions regulated by Europe will only be concrete and destined to success through the adoption of a global and systemic vision of plant production based on the ecology of plant nutrition in agro-ecosystems. The management of plant nutrition by the provision of mineral fertilizers finds a major limitation by disconnecting plant growth from the ecological processes which govern root growth, root exploration, as well as the nutritional and water potential of the soil in which it grows. develops the rhizosphere. The rhizosphere has the capacity to reduce nutrient losses by improving the nutrient uptake capacity of plants on the one hand, and on the other hand by modifying nutrient and water cycling processes resulting in increased retention. nutrients in the soil. It is therefore essential that agriculture reorients its practices in favor of rhizospheric biological interactions. The use of nature-based technologies maximizing the efficiency of rhizospheric biological processes appears to the MEZAGRI and SOBAC companies to be the best solution for sustainable agriculture. The new paradigm of ecologically intensive plant nutrition through the use of a complex of selected natural microorganisms guarantees high productivity, quantitatively and qualitatively, essential for food security, as well as essential ecosystem services. The objective of reducing nutrient losses will be beneficial for public health, for the preservation of fresh and marine water resources, as well as for the restoration of air quality, aquatic and terrestrial ecosystems whose ecosystem services will have positive externalities. It is also important to highlight that access to nutrients by plants via the rhizosphere is a lever for coherence between European approaches linking nutrient management, soil protection strategy, and action planning. for sustainable carbon cycles.

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User type
Business association
Organisation
European Consortium of the Organic-Based Fertilizer Industry (ECOFI)
Organisation size
Micro (1 to 9 employees)
Transparency register number
275714913510-19
Country of origin
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Initiative
Nutrients – action plan for better management

ECOFI urges the European Commission to include specific references to the use of organic-based fertilisers, including organo-mineral fertilisers, and integrated plant nutrition management practices as well as other fertilising products which directly contribute to enhanced nutrient use efficiency and better nutrient uptake; particularly in the context of the current global food and fertiliser crisis and its wide-ranging and long-term implications for food security. ECOFI would like to offer this and other insights to the elaboration of the integrated nutrient management action plan (INMAP), including where and how organic-based fertilising products may contribute to the desired impact of such an initiative. You can find ECOFI's contribution in the PDF attached. The European Consortium of the Organic-Based Fertiliser Industry (ECOFI) represents European producers of organic fertilisers, organo-mineral fertilisers, and organic soil improvers. www.ecofi.info | Twitter: @OrganiCarbon

European Consortium of the Organic-Based Fertiliser Industry (ECOFI)
in response to the Call for Evidence: Nutrients – action plan for better management'
See: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12899-Nutrients-action-plan-for-better-management_en

The European Consortium of the Organic-Based Fertiliser Industry (ECOFI) welcomes this initiative for an action plan for better management of nutrients, as established in the Circular Economy Action Plan. The call for evidence correctly outlines the need for better nutrient management and reduced nutrient losses and pollution, both of which organic-based fertilisers can contribute directly to.

ECOFI therefore urges the European Commission to include specific references to the use of organic-based fertilisers, including organo-mineral fertilisers, and integrated plant nutrition management practices as well as other fertilising products which directly contribute to enhanced nutrient use efficiency and better plant uptake; particularly in the context of the current global food and fertiliser crisis and its wide-ranging and long-term implications for food security. ECOFI would like to offer this and other insights to the elaboration of the integrated nutrient management action plan (INMAP), including where and how organic-based fertilising products may contribute to the desired impact of such an initiative.

ECOFI will continue to engage with the following steps in the consultation stage and is eager to contribute to this process over the coming months. Please do not hesitate to contact us for more information and details relating to organic-based fertilisers and nutrient management,

particularly in improving the nutrient use efficiency of plants and enhancing the health of soils. ECOFI calls on the European Commission to consider the following points in the elaboration of the INMAP:

• Nutrient use efficiency (NUE) is not mentioned at all in the call for evidence, whereas innovative plant nutrition solutions including improved NUE and products and practices which contribute to this should be explicitly recognised, and their uptake facilitated.
o The INMAP should promote the use of a key indicator to reduce nutrient losses such as the NUE indicator, which is broadly accepted by the scientific community.
• The INMAP should build on the vision of the European Parliament and take a holistic approach to the 50% target reduction of nutrient losses in Europe by 2030.
o ECOFI supports the 50% reduction of nutrient losses target; however, it questions whether this should translate into a 20% reduction in fertiliser use.
o Considering the current situation in Ukraine and its implications for global food and fertiliser supply, ECOFI strongly urges the Commission to encourage production of food, feed and fertilisers in the EU rather than actively advocating the reduction in capacity of EU production at a time of global food insecurity and uncertainty.

• The INMAP should incentivise sustainable nutrient management at farm and field level, including with regards to animal production.
o Appropriate application of nutrients from raw manures and slurry according to the needs of soils and crop production must be fostered; over-application of manures and slurry due to the proximity of animal production to fields is a substantial contributing factor to nutrient losses in some parts of Europe today.
o Refined organic-based fertilisers derived from animal by-products reduce nutrient losses by delivering them in a form where the nutrients are taken-up by plants as and when they are needed.
• The INMAP must foster balanced nutrition and improved nutrient management practices including requirements for the development of a fertilisation plan which is regularly updated throughout the year according to crop growth, weather and other factors.
o This should include the use of organic and organo-mineral fertilisers to improve nitrogen and phosphorus efficiency; improved nutrient uptake; enhanced soil health; and more.
• The INMAP should contribute to accelerating the uptake of circular economy practices by removing existing barriers to nutrient recycling from waste streams and other by-products.
o Many organic-based fertilisers are derived from recycled nutrients from other waste streams which would otherwise be discarded and lost to the environment, improving nutrient recycling and reducing losses.1
o Unfortunately, today, there are many regulatory barriers to the use of such recycled nutrients which need to be addressed first.2
• ECOFI therefore calls for the INMAP to include concrete policy options to promote and support innovative plant nutrition solutions such as refined organic-based fertilisers including organo-mineral fertilisers which could deliver some of the benefits listed above to reducing nutrient losses and pollution.

The Fertilising Products Regulation 2019/1009 provides access for organic-based fertilisers to the EU Single Market for the first time. This will be an essential tool for farmers to contribute to EU Green Deal objectives, including those outlined in the INMAP. However, for organic-based fertilisers to contribute to the objectives outlined in this call for evidence, the right policy, and regulatory coherence, frameworks and implementation are all required, including – as well as reaching far beyond – the implementation of the Fertilising Products Regulation 2019/1009.3

1 ‘The Circular Economy is the Nature of Organic-Based Fertilisers’, ECOFI infographic,

http://www.ecofi.info/2020/03/the-circular-economy-is-the-nature-of-organic-based-fertilisers/
2 Solvent-treated oilcakes must be included in the EU Fertilising Products Regulation to achieve its policy
goals – especially because they are already allowed for use in food, feed, and organic farming!, http://www.ecofi.info/2022/03/solvent-treated-oilcakes-must-be-included-in-the-eu-fertilising-products-regulation-to-achieve-its-policy-goals-especially-because-they-are-already-allowed-for-use-in-food-feed-and-organic/
3 "In a loss for the Circular Economy, Fertilising Products containing animal by-products are frustrated
from entering the Single Market under the Fertilising Products Regulation (FPR)", Joint Media Release,
http://www.ecofi.info/2022/03/in-a-loss-for-the-circular-economy-fertilising-products-containing-animal-by-products-are-frustrated-from-entering-the-single-market-under-the-fertilising-products-regulation-fpr/
4 Juan Tur-Cardona et al., "Farmers' Reasons to Accept Bio-Based Fertilizers: A Choice Experiment in
Seven Different European Countries," Journal of Cleaner Production 197 (October 1, 2018): 406–16, https://doi.org/10.1016/j.jclepro.2018.06.172

Coherence crucial across EU policies

There must be coherence between all relevant policy frameworks that govern agricultural production, inputs, and land use to reduce nutrient losses across Europe. This includes the Fertilising Products Regulation (FPR), Common Agricultural Policy (CAP), Organic Production Regulation, Farm to Fork Strategy, Biodiversity Strategy, Circular Economy Strategy, the new EU soil strategy, the INMAP and more. But this coherence needs to go beyond soundbites and include impact assessments of specific measures to understand the trade-offs and make informed decisions.

Ensuring a Single Market for all relevant products should also be central to policy coherence. This is currently not the case for organic production, where acceptance of agricultural inputs varies from one Member State to another and from one certifying body to another. Such discrepancies across the EU currently represent a hindrance to practical measures for nutrient management, particularly in the context of the EU's Farm to Fork objectives for increased organic agricultural land.

Training and Education needed

The CAP should also ensure adequate training, advisory, and incentives for farmers to learn about and adopt sustainable, site-specific practices to improve soil health, such as integrated plant nutrition and soil fertility management, within conventional and organic farming. This is especially important in light of recent research showing that farmers have more demanding standards for bio-based fertilising products fertilisers than for mineral fertilisers, yet are not willing to pay as much for bio-based fertilisers.4

About ECOFI

The European Consortium of the Organic-Based Fertiliser Industry (ECOFI) represents European producers of organic fertilisers, organo-mineral fertilisers, and organic soil improvers.

www.ecofi.info | Twitter: @organiCarbon

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Submitted by
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User type
Company/business
Organisation
Yara Belgium
Organisation size
Large (250 or more)
Transparency register number
68208004617-79
Country of origin
Norway
Initiative
Nutrients – action plan for better management

Yara would like to thank the European Commission for the opportunity to contribute to the preparatory work for the EU action plan for better management of nutrients (Integrated Nutrient Management Action Plan, INMAP). Yara helps European farmers to select and manage plant nutrients in a sustainable way, in line with our mission to responsibly feeding the world and protecting the planet. By providing farmers with tools and services enabling a precise and balanced nutrient management in combination with high-quality fertilizing products, we help them to preserve the fertility of their soils and to improve the efficiency of their practices, to make every nutrient count. Yara Europe's key messages: 1. The INMAP should take a holistic approach to halving nutrient losses in Europe by 2030. 2. The INMAP should foster the use of a key indicator to reduce nutrient losses, namely the Nitrogen Use Efficiency indicator, which is broadly accepted by the scientific community. 3. The INMAP is an opportunity to further incentivize sustainable nutrient management at farm level. 4. Focus on boosting the best practices at farm level. 5. Focus on farm practices to enhance phosphorus efficiency. 6. The INMAP should contribute to accelerating circular economy practices by removing existing barriers and looking at inter-relations with other sectors.

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Brussels, 26 April 2022
Call for evidence for an initiative

Nutrients – action plan for better management

Yara would like to thank the European Commission for the opportunity to contribute to the preparatory work for the EU action plan for better management of nutrients (Integrated Nutrient Management Action Plan, INMAP). Yara helps European farmers to select and manage plant nutrients in a sustainable way, in line with our mission to responsibly feeding the world and protecting the planet. By providing farmers with tools and services enabling a precise and balanced nutrient management in combination with high-quality fertilizing products, we help them to preserve the fertility of their soils and to improve the efficiency of their practices, to make every nutrient count.

Yara's own research shows that by using best practices and solutions that exist today, European farmers can already improve nutrient use efficiency by at least 20%, increase yields and incomes by 5-7% and reduce their carbon footprint related to mineral fertilization up to 20%.

Yara Europe's key messages:

1. The INMAP should take a holistic approach to halving nutrient losses in Europe by 2030.
2. The INMAP should foster the use of a key indicator to reduce nutrient losses, namely the Nitrogen Use Efficiency indicator, which is broadly accepted by the scientific community.
3. The INMAP is an opportunity to further incentivize sustainable nutrient management at farm level.
4. Focus on boosting the best practices at farm level.
5. Focus on farm practices to enhance phosphorus efficiency.
6. The INMAP should contribute to accelerating circular economy practices by removing existing barriers and looking at inter-relations with other sectors.

1. The INMAP should take a holistic approach to halving nutrient losses in Europe by 2030

Best practice crop nutrition management, ensuring balanced fertilization suited for local conditions, is at the core of all good agricultural practices. At the same time, organic and mineral nutrients are complementary and not mutually exclusive. Used in the right quantities and forms, they are both needed to provide safe, affordable and sustainable food to the end consumer. However, on-farm sources of nutrients are rarely sufficient to meet all crop needs as they generally do not provide the full range of nutrients or lead to soil depletion in the long run.

Mineral fertilizers are thus an essential complementary product to help close the gap between the nutrient supply from the soil and the plant's nutrient requirement for optimum development and to provide nutrients that can be immediately taken up by the plant. This is best practice for an efficient use of nutrients, where manure and mineral fertilizers are used in combination.

In addition, reducing nutrient losses also means closing nutrient cycles, which requires collaboration throughout the entire food value chain. That's why Yara is also actively engaged in projects that contribute to a more circular economy as another route for reducing nutrient losses to the environment.

Due to the above, INMAP needs to take a holistic approach to halving nutrient losses in Europe by 2030 and focus on losses from both organic and mineral sources. This is in line with the European Parliament's resolution1 on Farm to Fork Strategy, which puts focus on nutrient losses from both sources and not on reduction in fertilizer use:

" 9. Welcomes … the reduction targets for pesticides, nutrient losses from both organic and mineral sources and sales of antibiotics …"

"14. Welcomes the Commission's commitment to act to reduce nutrient losses by at least 50 %, while ensuring that there is no deterioration in soil fertility; is convinced that this would be best achieved through the closure of nutrient cycles, nutrient recovery and reuse and encouraging and rewarding farmers to plant leguminous crops; ..."

“14.… highlights the importance of the application of modern and innovative technologies and solutions
such as precision farming, targeted fertilization that is adapted to plant requirements, and plant nutrition
advisory services and management support, as well as the need to install broadband in rural areas for that purpose …”

2. The INMAP should foster the use of a key indicator to reduce nutrient losses

The EU’s goal of halving nutrient losses by 2030 is only eight growing seasons away. That means every
step towards achieving this ambition must contribute to optimizing yields, producing healthier crops, enhancing soil health, and ensuring the economic viability of European farmers. This can be done by making every nutrient count.

a. Implementing tailored nutrient management strategies

Nutrients are exported from the field when crops are harvested. To maintain soil fertility for sustainable
crop yields and quality, nutrients exported from the field with the harvest and lost to the environment must
be replaced by other organic and/or mineral sources to avoid soil nutrient mining. Still, as stated in the EU’s Agricultural Outlook 2021-2030 report2, Nitrogen (N) and Phosphorus (P) have different characteristics and therefore, require tailored management strategies to ensure compliance with future EU ambitions. In addition, according to the same source, mineral fertilisation is less often the reason for
excessive nutrient surpluses, but optimised fertilisation is important to contribute to the general reduction
of nutrients emitted to the environment and to avoid nutrient scarcities in the future. Therefore, to best achieve the ambition to reduce nutrient losses by half and as recommended by the recent report3 of the
Wageningen Economic Research, the nutrient use efficiency indicators, such as the NUE indicator developed by the EU Nitrogen Expert Panel should be endorsed and the application of tools to achieve

1 https://www.europarl.europa.eu/doceo/document/TA-9-2021-0425_EN.html

2 EC (2021), EU agricultural outlook for markets, income and environment, 2021-2031. European Commission, DG Agriculture
and Rural Development, Brussels.

3 Bremmer, J., Gonzalez-Martinez, A., Jongeneel, R., Huiting, H., Stokkers, R., & Ruijs, M. (2021). Impact assessment of EC
2030 Green Deal Targets for sustainable crop production. (Report / Wageningen Economic Research; No. 2021-150).
Wageningen Economic Research. https://doi.org/10.18174/558517

this (e.g. variable rate application) must be incentivised. This will contribute to accelerate sustainable nutrient management.

b. Reducing nutrient losses by Improving Nitrogen Use Efficiency (NUE)

The concept of Nitrogen Use Efficiency (NUE) describes the relationship between nitrogen supply to a
crop and nitrogen removal from the field by the harvest. NUE can be described as the percentage of the
nitrogen contained in the crop (kg) of the nitrogen applied (kg). The nitrogen applied is essentially composed of mineral and organic fertilization, biological nitrogen fixation, the nitrogen deposition and
nitrogen residues from cultivation in the previous year. The European Nitrogen Expert Panel, a network
of European scientists, decision makers, and representatives from the agricultural sector and industry, does not recommend a general reduction in nitrogen quantities as a solution to

effectively prevent nitrogen losses. In fact, less is not always more. It is seen as more appropriate to optimize the ratio between crop yield and nitrogen supply. A high rate of nitrogen fertilization that produces a high yield can be just as efficient and have limited losses compared with a low amount of nitrogen with a low yield.
If we look at the current situation in the EU, there is still possibility to improve Nitrogen Use Efficiency.
The Nitrogen Use Efficiency indicator in EU-28 in 2014 was 65%4, while the European Nitrogen Expert panel5 recommends a NUE target of between 75% and 90%6. The most recent research also shows that to achieve surface water quality targets without crop production losses, average NUE needs
to increase from 64% to 78%, whereas achieving groundwater targets only requires a modest increase from 64% to 67%. In hotspot areas, however, redistribution of N inputs and improved N management might need to be complemented by other strategies, such as improving manure storage and spreading, or reducing crop demand by e.g. cutting food waste7.
c. Reconciling agriculture production with environmental objectives
The above-mentioned metric is particularly important because despite already ranking among the world's
highest-producing regions, Europe's agricultural production will probably need to increase in the future
for several reasons8:
1) The first reason is geo-political: since 1990, Europe has shifted from food self-sufficiency to import dependency with many European countries currently producing less than 70% of their domestic demand. This import dependency makes Europe vulnerable in case of scarcity on global crop markets9.
4 EUROSTAT
5 http://www.eunep.com/
6 M. Quemada, L. Lassaletta, L.S. Jensen, O. Godinot, F. Brentrup, C. Buckley, S. Foray, S.K. Hvid, J. Oenema, K.G.
Richards, O. Oenema, Exploring nitrogen indicators of farm performance among farm types across several European case
studies, Agricultural Systems, Volume 177, 2020, 102689, ISSN 0308-521X, https://doi.org/10.1016/j.agsy.2019.102689.
7 Source: Lena Schulte-Uebbing, Wim de Vries, Reconciling food production and environmental boundaries for nitrogen in the
European Union, Science of The Total Environment, Volume 786, 2021, 147427, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2021.147427.
8 Lena Schulte-Uebbing, Wim de Vries, Reconciling food production and environmental boundaries for nitrogen in the European
Union, Science of The Total Environment, Volume 786, 2021, 147427, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2021.147427.
9 Idem.

2) Secondly, the current crop yield growth rates are likely insufficient to meet the increasing world demand and if growing demands cannot be met by domestic production and pressures on global food markets increase, it is likely that trade with Europe will play a role in meeting demands10.
3) The third reason is to avoid spill-over effects: at constant global demand, a reduction in European food production would shift production to other regions with potentially less strict environmental regulations11, thus, effectively relocating environmental damage. In addition, the recent Joint Research Centre (JRC) report12 on “Modelling environmental and climate ambition in the agricultural sector with the CAPRI model” stated that meeting the Farm to Fork target for reduction of gross nutrient surplus is one of the two main drivers behind the reductions in production and that therefore special attention needs to be paid to how these targets are implemented and accompanied by Common Agricultural Policy (CAP) and other measures.
Reducing nutrient losses in the EU should be approached through improving Nitrogen Use

Efficiency (NUE) to avoid yield losses, outsourcing of production to regions with lower standards and deterioration in soil fertility (see illustration below13). The INMAP should contribute to identify the required improvement of the NUE indicator to ensure a safe operating space at regional or other relevant level. Therefore, establishing an EU-wide general target on reducing nutrient use would go against this approach and should be avoided by the European Commission.
10 Idem.
11 https://www.nature.com/articles/d41586-020-02991-1
12 Barreiro Hurle, J., Bogonos, M., Himics, M., Hristov, J., Perez Dominguez, I., Sahoo, A., Salputra, G., Weiss, F., Baldoni, E.
and Elleby, C., Modelling environmental and climate ambition in the agricultural sector with the CAPRI model, EUR 30317
EN, Publications Office of the European Union, Luxembourg, 2021, ISBN 978-92-76-20889-1 (online), doi:10.2760/98160
(online), JRC121368.
13 Icon from: Valve (flaticon.com)

3. Further incentivizing sustainable nutrient management in Europe
With only eight growing seasons left until 2030, key opportunities must be taken at the European and national levels via the new Common Agricultural Policy (CAP). A mix of targeted incentive mechanisms,
pilots, collaborative approaches and knowledge exchanges will be needed to support farmers and the food value chain in scaling up current efforts to halve nutrient losses by 2030. For example:
• Farmers' profitability and sustainability efforts could be supported via the CAP Strategic Plans. One option could be to upscale best nutrient management practices at farm level beyond the current baseline, by focusing interventions on the need to improve nitrogen use efficiency.
• The CAP, and esp. the eco-schemes, should support farmers' efforts to transition towards a more sustainable way of farming via the use of precision farming tools that can demonstrate improvements in water use or nitrogen use efficiency. Here, the use of decision-support and digital tools should be recognized as an acceptable approach to support the efficient use of nitrogen by basing the nutrient management plans on the recommendation resulting from such tools.
Best practice crop nutrition management is at the core of all good agricultural practices. The following
image illustrates how farmers can optimize the nutrient use during the crop growing cycle.
Farmers need to be enabled to further improve their farm-activities through practices indicated above and
with adequate support toolbox ranging from agronomic advice (see example from Sweden below) to financial support, as well as farm management systems and tools (such as precision farming), in order to sustain the different soil ecosystem functions and reduce nutrient losses.
and risk of N2O losses.

Example from practice – Greppa Näringen advisory service in Sweden
Greppa Näringen14 is a long-term advisory program and is financed through the Swedish Rural Development Program. In recent years, around SEK 50 million per year have been invested in the project, most of which has been used for individual advice around the counties in Sweden. The advice provided under this service is voluntary and free; farmers can choose from many different advisory modules, including on nutrient balances and nitrogen strategy. The Greppa Näringen advisors have made approximately 5,000 advisory visits related to nitrogen strategies, precision cultivation and testing
of mineral fertilizer spreaders. The advice in all visits had the same goal: to develop strategies that combine reducing risks for nitrogen leakage and greenhouse gas emissions with efficient production. To study the changes the members in Greppa Näringen have achieved during the years, farms were compared before and after receiving counselling. In the analysis15 of about 3,400 conventional farms

that have made at least two crop nutrient balances between 2001 and 2016, it can be concluded that the nitrogen surplus has decreased on crop farms, dairy and pig farms. The change in kg nitrogen per hectare was -3.6 for crop production, -6.4 for milk and -16.3 for pig production. The great work that farmers and advisers have done on the farms within Greppa Näringens counselling reflects the positive
results reached within the project.

4. Focus on boosting best practices at farm level

In order to contribute to the EU's objective of a more sustainable application of nutrients, Yara has identified three main pathways to boost best practices at farm level. The below solutions should be an integral part of the actions at EU and national level to tackle the nutrient challenge.

a. Tackling pollution at source by adding precision and knowledge to crop nutrition planning

Plant nutrition is complex and changing weather conditions make it even more challenging for farmers to
ensure that the different nutrients they apply end up in the harvest and not in the environment. Precision
farming and digital tools, apps and sensors, as the ones developed by Yara (Atfarm, N-Sensor and N-Tester BT), empower farmers to optimize fertilization over the growing season. This helps to improve the efficiency of the nutrients used and the quality of the harvested crops, while reducing the losses to the environment.

Example from practice – Use of precision farming in Denmark

Danish project "Future cropping"16 has calculated that redistribution of nitrogen (N) inputs within the field, and a corresponding gain from redistribution between fields, by using precision farming tools can
lead to a reduction in nitrogen leaching of 1 to 4 kg N per hectare while ensuring the financial gain for the farmer.

Technology developments in irrigation, such as the use of drip irrigation system, have also influenced innovations in the use of fertilizers. The so-called "fertigation" is the combined application of water and
nutrients to a crop. Fertigation increases both water and nutrient use efficiency – especially important in the greenhouse production and areas affected by climate change and water scarcity.

In addition, fertigation software (such as YaraTera™ Fertigation Software) allow the calculation of a crop's
14 https://greppa.nu/
15 https://greppa.nu/download/18.7874303f17ff25097a0b8b7/1649055320752/2103111006-Jubileumsskrift-Webb.pdf
16 https://futurecropping.dk/

nutrient demands at every growth stage. For each stage, a plan of inputs can be made, maximizing the effectiveness of applications as well as minimizing wastage of product. This potential of fertigation in water and nutrients savings without losses in the yield and the quality of crops, along with the reduction
of nutrient losses makes it an important tool for farmers that should be further promoted. As such, EU and
its Member States should consider assisting farmers in their initial fertigation related investments.

Example from practice – Yara fertigation trials in tomatoes production

In the Yara tomatoes production field trials, fertigation - combined application of water and nutrients - reduced water use by 36% and increased nutrient efficiency by 16% kg/mt fruit, compared to the conventional practice17.

b. Reducing greenhouse gas emissions by opting for low-carbon footprint mineral fertilizers

Considering the climate footprint of fertilizing products is an important step to reduce nutrient losses to
the atmosphere. Yara's nitrate-based fertilizers have today a carbon footprint that is on average 50-60%

lower than other similar products. This is because Yara has developed the best performing catalysts for
the production process, which reduce N2O emissions from fertilizer production by as much as 90%. Already next year Yara will also bring to market fossil free, green fertilizers produced using renewable
electricity instead of fossil fuels as a key step towards decarbonising the food chain18.

Example from practice – Low-carbon farming in the French rapeseed sector

The Saipol (a subsidiary of the Avril group, and the French leader in rapeseed and sunflower processing) and Yara France recently announced the launch of a joint partnership to promote low-carbon farming in the French rapeseed sector. The objective of this collaboration is to encourage and reward rapeseed farmers willing to change their fertilization practices to reduce their greenhouse gas (GHG) emissions footprint. Farmers participating in this initiative receive a GHG premium which is granted according to the criteria set by the OleoZE calculator (€/t). The calculator helps to identify the greenhouse gas impacts of the most important factors at farm level, which are the agronomic practices and the supply of mineral nitrogen. An additional bonus is provided for farmers switching to the use of
ammonium-nitrate fertilizers (which results in - 15 % in kg CO2 eq/t compared to liquid nitrogen fertilizer,
namely Urea Ammonium-Nitrate - UAN19).

17 https://www.yara.com/siteassets/crop-nutrition/products-and-solutions/field-fertigation/field-fertigation-brochure.pdf/

18 https://www.yara.com/crop-nutrition/products-and-solutions/green-fertilizers/what-you-need-to-know-about-green-fertilizers/

19 Comparison made at the scale of France and based on the Yara GHG simulator, based on the rapeseed area and the average national
yield, all other equal practices elsewhere (tillage, other inputs ...).

c. Improving air quality by choosing the right mineral fertilizer and the right nitrogen form

Different fertilizing products have different environmental impacts. By choosing the right mineral fertilizer
and the right nitrogen form, farmers can contribute to the cleaner air in the EU and reduce nutrient losses
to the air, while each kg of nitrogen kept in the soil increases nitrogen efficiency and plant uptake. Replacing all urea-based fertilizers with ammonium-nitrate could prevent 63% of overall ammonia emissions from fertilizer application in Europe.

Different fertilizers with different impacts

Table on the right shows the ammonia emissions (2014) from main mineral fertilizers according to the emission factors defined by the European Environmental Agency. Urea (53.7 %) and urea-ammonium nitrate UAN (18.4 %) together account for 72 % of these emissions, while calcium-ammonium nitrate CAN and ammonium nitrate AN amount for only 2,9 and 4,6 % respectively.20

Currently, 95% of global urea is produced outside of Europe. The increase in urea use and imports into
the EU (+76% in the last 10 years21) is therefore a worrying development colliding with EU efforts to improve the air we breathe and reduce greenhouse gas emissions. Although urease inhibitors (and fertilizers containing them – referred often as enhanced efficiency fertilizers) can reduce ammonia volatilization from urea, ammonia emissions still remain more than 3 times higher than those from ammonium nitrate. In addition, fertilizers with inhibitors add an additional chemical compound into the
food production and as the Commission pointed out in its reply to the ECA's special report on CAP and

climate22 - particularly in the long-term, should be evaluated with care before the farming practice can be
recommended for large-scale application.

5. Focus on farm practices to enhancing phosphorus efficiency

Next to nitrogen, phosphorus is the other essential plant nutrient covered by the Farm to Fork target of halving losses by 2030. This is particularly relevant for reducing excess nutrients' surface runoff from fields. Eutrophication of surface water with phosphorus (P) and its negative impact on biodiversity can be
reduced with spring application of highly plant available phosphorus. By doing this, autumn application of phosphorus and related high risk of surface run off during winter rains and snow melt can
be avoided. On top, P rate can be reduced due to higher phosphorus use efficiency with this approach.

Another strategy to minimize phosphorus losses at field level is the proper incorporation into soils. The application method of mineral phosphorus sources, combined with a better utilization of phosphorus in on-farm organic sources, contributes to increasing phosphorus use efficiency and to reducing losses. Yara's R&D hubs in Germany and Finland have conducted field trials comparing different
application methods. Banding phosphate containing fertilizers close to seeds at planting increases phosphorus use efficiency, in comparison with surface application (followed by soil incorporation). Placement of phosphorus in a band can reduce losses by reducing its exposure to soil

20 Hutchings N, Webb J, Amon B (2016): EMEP/EEA air pollutant emission inventory guidebook.
21 EUROSTAT
22 https://www.eca.europa.eu/Lists/ECAReplies/COM-Replies-SR-21-16/COM-Replies-SR21_16_EN.pdf

microorganisms and processes that lead to leaching. Banding of phosphorus fertilizer is a widespread practice for growing corn in the United States and was recently tested in our field trials for spring cereals
in Finland23. Benefits for the crops, the soil and the environment were improved availability of the different
nutrients, which are thus not lost in the environment; and higher phosphorus use efficiency, which means
more phosphorus captured in the crop and lower costs for the farmers.

Example from practice – Gypsum treatment of soil in Finland

Gypsum treatment of agricultural soils has been studied in Finland for more than 10 years. Application of gypsum adds to the soil's ability to absorb phosphorus and capture organic carbon and can reduce phosphorus loads from fields. In 2020, the Finnish Ministry of Environment launched a three-year pilot project on gypsum treatment of fields, with the ultimate objective of reducing nutrient leaching from agriculture to Baltic Sea. The project involves 85 000 ha and 3-4 000 farmers and will be supported by deliveries of approximately 350 000 tonnes of phospho-gypsum from Yara's facilities in Siilinjärvi. Researchers estimate that by applying gypsum to the fields, Finland alone could reduce the phosphorus load to the Baltic Sea by 300 tonnes annually.

According to the John Nurminen Foundation24, if all the fields in the Baltic Sea area were treated with
gypsum, we could reach up to a third of the annual phosphorus reduction that, according to HELCOM,
the Baltic Marine Environment Protection Commission, is required to restore the good status of the Sea. As part of their Gypsum Initiative beyond Finland - Poland, Sweden, Lithuania and Denmark were
recognized as the most promising regions for gypsum treatment. These countries are important

agricultural producers, and they have both the interest and the expertise needed for waterway protection.
Of course, other types of efforts to reduce P-losses, that showed results in different Member States need to be looked at since there can't be a one-size-fits-all approach. For example, already for few years there is a program in Sweden with financial support from the Swedish Agency for Marine and Water
Management with results similar to the ones of the Gypsum project in Finland, where the slaked lime on
clay soils is used to improve aggregate stability and thus reduce losses of soil particles and P to water via run-off or leaching.
6. Accelerating Circular Economy practices by removing existing barriers and looking at inter-relations with other sectors
The INMAP should contribute to increase the use of recovered and organic nutrients. Yara believes that
the circular economy will play an important role in changing the agriculture and will require a shift in the
entire food industry. Through our strategic partnerships with waste management and food companies such as Veolia, Yara works to find the best avenues to close the nutrient loop and provide more organic
23 University of Minnesota Extension, https://extension.umn.edu/crop-specific-needs/using-banded-fertilizer-corn-production
24 Gypsum treatment, a key method for treating cultivated fields, expanded outside Finland | John Nurmisen Säätiö (johnnurmisensaatio.fi)

fertilizers by improving the recycling of urban waste25. Nutrients appearing as waste through or at the end
of the cycle can be assessed for re-use either directly or by processing as long as food safety and farm value can be proven. While much attention is directed at wastewater and other secondary raw material sources, it is equally important for society to continue reducing food waste and not least providing farmers
with better tools to lower on-field losses of crop nutrients.
a. Tackling nutrient imbalances in organic farming
Several studies show that organic farms often have negative balances for phosphorus and potassium, particularly in specialist arable organic farms (without livestock). In addition, inefficient use
of sulphur is usually linked to inefficient use of phosphorus (P) and potassium (K), creating difficulties to
follow the principles of balanced plant nutrition. Farms which rely largely on biological nitrogen fixation
have more negative P and K balances. For instance, 14 % of soils across one samples of organic farms showed soil phosphorus below agronomic optimal levels, which will reduce crop production. This would
ultimately increase the risk of soil depletion and so decreasing soil health26.
If the principle of recycling from wastes in Organic Farming is not more widely implemented for secondary sources of nutrients (i.e. recycled), especially phosphorus, then nutrient deficits will increasingly handicap Organic Farming in Europe, and will prevent the realization of the Farm-to-Fork ambition of increasing the area to be farmed under organic farming principles by 2030.
Further recycled materials, containing phosphorus, but also potassium and nitrogen, should therefore be assessed for future addition to the EU Organic Farming Regulation list of input materials, coherent with organic farming principles, quality, safety, and consumer confidence.
This is in line with the recently adopted report of the European Parliament's Agricultural Committee on
the EU's Organic Action Plan (2021/2239(INI))27:
"62. … calls on the Commission to assess new recycled materials containing essential plant nutrients

(phosphorus, potassium and nitrogen) for their future addition to the list of input materials in Regulation
(EU) 2018/848, in line with the principles of organic farming and ensuring quality, safety and consumer
confidence;"
"63. … points out that the promotion of the use of an adequate farm-specific combination of different external nutrients, on top of biological nitrogen fixation, could address the challenge of the imbalances
in nutrient budgets in organic farming systems;"
Yara would, therefore, like to encourage the inclusion of struvite and calcined phosphates recovered from municipal wastewater under the scope of the EU Organic Farming Regulation annex. The Expert Group for Technical Advice on Organic Production (EGTOP) has expressed a positive
opinion on the inclusion of these fertilizing products already in 2016, and the condition of validation as EU
fertilizing products is now technically finalized28.
25 https://www.yara.com/knowledge-grows/ensuring-food-waste-doesnt-go-to-waste/
26 Reliance on Biological Nitrogen Fixation Depletes Soil Phosphorus and Potassium Reserves", M. Reimer, Nutr Cycl Agroecosyst 2020,
https://doi.org/10.1007/s10705-020-10101-w
27 https://www.europarl.europa.eu/doceo/document/A-9-2022-0126_EN.html
28 STRUBIAS annexes of the new EU Fertilizing Products Regulation 2019/1009

• We request that the precise criteria for inclusion of these two materials should be finalized as soon as possible, so that they can be added into the EU Organic Farming Regulation immediately after the STRUBIAS annexes will have formally been integrated into EU Regulation 2019/1009.
• We also suggest that the inclusion of these two materials from sources other than municipal wastewater should be considered, in particular from food processing waste and wastewaters, dairy processing, abattoir wastes (subject to Animal By-Product safety requirements), manure (not from highly intensive farming).
Yara would also like to encourage the European Commission, EU Member States, the EGTOP and the European Organic Farming community to consider in the near future other sources of recycled nutrients
such as Ammonium Sulfate, Ammonium Nitrate and other Ammonium salts, originating from physico-
chemical (stripping) processes of organic streams (esp. wastewater and digestate out of not highly intensive substrates).
b. Inter-relations with other sectors
Finally, it should be noted that the fertilizer industry also supplies Europe with the urea- and ammonia-
based chemicals required for abating problematic NOx emissions. AdBlue® , a diesel exhaust fluid used
in vehicles with Selective Catalytic Reduction (SCR) technology to reduce harmful gases being released
into the atmosphere, is critical to the continued reduction of emissions from the transport sector. Urea and ammonia are essential reagents to clean the emissions from combustion plants, incl. electricity power
plants, waste-to-energy plants, cement plants, etc.
As we work to promote the replacement of all urea-based fertilizers with ammonium nitrate (ref. point 4c.
above) we free up more of our urea production capacity. This capacity can instead be put to use in sectors
such as transport and industry – both still major sources of emissions to air.

Yara's ambition to grow a climate positive food future requires zero-emission energy solutions. Through
our focus on clean ammonia production, we aim to enable the hydrogen economy. During the energy transition phase our Industrial division improves air quality in Europe by offering both the urea- and ammonia-based reagents, as well as the best available technologies for NOx and SOx reduction.
Yara reference documents:
• Factsheet "Making every nutrient count"
• Roadmap "Putting the Farm to Fork Strategy into action"
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About Yara
Yara grows knowledge to responsibly feed the world and protect the planet. Supporting our vision of a world without
hunger and a planet respected, we pursue a strategy of sustainable value growth, promoting climate-friendly crop
nutrition and zero-emission energy solutions. Yara's ambition is focused on growing a climate positive food future
that creates value for our customers, shareholders and society at large and delivers a more sustainable food value
chain.
To achieve our ambition, we have taken the lead in developing digital farming tools for precision farming, and work
closely with partners throughout the food value chain to improve the efficiency and sustainability of food production.
Through our focus on clean ammonia production, we aim to enable the hydrogen economy, driving a green transition
of shipping, fertilizer production and other energy intensive industries.
Founded in 1905 to solve the emerging famine in Europe, Yara has established a unique position as the industry's
only global crop nutrition company. We operate an integrated business model with around 17,000 employees and
operations in over 60 countries, with a proven track record of strong returns. In 2020, Yara reported revenues of
USD 11.6 billion.

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Non-governmental organisation (NGO)
Organisation
Amis de la Terre France
Organisation size
Small (10 to 49 employees)
Country of origin
France
Initiative
Nutrients – action plan for better management

Attached, you will find a contribution from Friends of the Earth France, who have been working on synthetic fertilizers for several years. Based on this experience, the levers mainly identified to reduce the consumption of synthetic fertilizers and fertilizer losses are: the reduction of livestock and the exit from industrial livestock farming, investment in organic farming and in the production of legumes, as well as the implementation of restrictive measures (capping and taxes on synthetic fertilizers in particular). This contribution includes: - elements of observation - points of attention - proposals, shared by 21 French environmental, citizen and farmer organizations to reduce dependence on synthetic fertilizers - proposals supported by Friends of the Earth France

Contribution from Friends of the Earth on
consultation “Nutrients – action plan for
better management »
European:
1. Friends of the Earth France joins and wishes to strengthen the
findings made in the Commission's call for contributions
https://doi.org/10.21203/rs.3.rs-1007419/v1
Friends of the Earth France have been working for many years on the impact of synthetic fertilizers on the climate and on farmers' income. Our association identifies existing alternatives, and more recently the link between synthetic fertilizers and food and energy sovereignty.
and almost half of greenhouse gas
emissions (in particular linked to the nitrous oxide emitted) from the agricultural sector in France.
At the European level, the European Union consumes 11.1 million tonnes of nitrogen
,
Based on this experience, the levers mainly identified to reduce the consumption of synthetic fertilizers and fertilizer losses are: the reduction of livestock and the exit from industrial livestock farming, investment in organic farming and in the production of legumes, as well as the implementation of restrictive measures (capping and taxes on synthetic fertilizers in particular).
- Greenhouse gas emissions linked to the production and application of fertilizers currently represent 2.4% of global emissions1
ambitious :
• We converge on the identified issues justifying an action plan
1 Stefano Menegat, Alicia Ledo and Reyes Tirado, “Greenhouse gas emissions from global production and use of nitrogen synthetic fertilisers in agriculture”, Research Square Preprints, 22 October 2022:
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- Overall environmental costs are estimated at between 70 and 320 billion euros per year in Europe, which means economic costs up to 37 billion euros higher than the productivity gains

made possible by the use of fertilizers synthesis2 .
- These surpluses have a deleterious impact on the quality of water and air, and consequently on biodiversity and human health. Indeed, in Europe, 36% of rivers, 32% of lakes, 31% of coastal waters, 32% of transitional waters and 81% of marine waters have been reported as eutrophic. for the period 2016-2019. In terms of human health, agriculture is responsible for half of atmospheric emissions of nitrogen pollutants, which are themselves responsible for 374,000 premature deaths.
synthesis annually, this represents more than 115 million tonnes of CO2 emitted each year, or almost 30% of European agricultural emissions.
- Excess nitrogen and phosphorus released and stored in the atmosphere today exceed existing planetary limits for these nutrients, which poses serious dangers to the habitability of our planet.
- The natural route of nitrogen has been disrupted, becoming linear and no longer cyclical. Indeed, the majority of nitrogen used in agriculture is produced chemically (at the cost of a significant climatic impact) in order to fertilize crops, while at the same time saturating natural environments with fertilizing elements, to then be ingested. during their food consumption by humans and animals, without animal and especially human waste being then properly used to return to fertilize crops. The only way to close the nitrogen cycle would therefore be to move away from the chemical manufacturing of fertilizers and to properly recycle the nitrogen ingested by humans and animals (in particular by recovering wastewater and human urine at the source).).
- Synthetic fertilizers being produced from Russian gas, they are today a real diplomatic burden for the European Union in its standoff with Russia, and make any energy independence and food sovereignty for our continent impossible.
- The erosion of soil fertility has begun due to the overuse of synthetic fertilizers which saturate the soil's capacity to regenerate.
- Dependence on synthetic fertilizers is a real socio-economic burden for farmers and breeders. In fact, they find themselves at the mercy of fluctuations in energy prices and consequently the price of fertilizers and cereals. Not to mention that fertilizer producers can stop production when energy prices increase, which increases inflationary pressure on this input. The economic costs linked to the purchase of inputs already weighed almost 15% of the budget of agricultural operations in France before the increase in prices observed today, which endangers many farms.
• Other findings to take into account:
https://www.researchgate.net/publication/51997325_The_European_Nitrogen_Assessment_Sources_Effects_and_Policy_Perspectives
2
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- 80% of synthetic fertilizers are used to produce animal feed, which will feed animals on industrial farms5 . The first lever for reducing fertilizer consumption is therefore the reduction of livestock at European level, which is also made necessary for numerous environmental reasons (nitrate pollution, greenhouse gas emissions, deforestation, methane emissions, etc.) . Europe is the relevant level for organizing the exit from industrial livestock farming and the concerted reduction of livestock numbers between States, in order to prevent production from competing between countries or from industrialists setting up in another European country. if they can no longer breed animals in their own country (case of the Dutch group Plukon which invests in industrial poultry farming in France, because the regulations on nitrates in the Netherlands
- Some European countries have implemented public policies which work more or less well to reduce their dependence on synthetic fertilizers and this feedback must therefore contribute to the reflection on the European action plan. The very non-binding instruments put in place in France do not work (see graph in appendix) and France remains the leading fertilizer consumer country in Europe. This should be compared with the ambitious policies of other European countries (Austria, Sweden, Norway) which have implemented a tax on synthetic fertilizers while massively supporting (in the case of Sweden and Austria) organic farming in

order to have a real impact in reducing the consumption of synthetic fertilizers (see graphs in appendix)4 .
has become too restrictive).
- The link between consumption of fertilizers and pesticides is now proven: plants overfed with nitrogen are more attacked by certain pests and by pathogenic fungi which are hungry for this element3 . Impossible, therefore, to decrease the consumption of synthetic pesticides without reducing the consumption of synthetic nitrogen fertilizers. This shows the importance of having a common treatment of these issues (by supporting organic farming which does without these inputs), and not diluted in a plurality of plot instruments, in order to achieve our environmental objectives and ensure the continent's food resilience.
3 Claude Aubert, The apprentice sorcerers of nitrogen, January 2021, Living Earth.
https://www.amisdelaterre.org/wp-content/uploads/2021/06/redevance-engrais-azotes-juin-2021.pdf
5 Claude Aubert, The apprentice sorcerers of nitrogen, January 2021, Living Earth.
4 All the elements on public policies to reduce the consumption of synthetic fertilizers and on the consequences of establishing a fee can be found here:
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the development of the European action plan:
2. Friends of the Earth France asks the Commission
European to remain vigilant on the points below in
- It is essential not only to take into account the losses of fertilizers spread but the reduction of these fertilizers themselves and therefore the fertilizer consumption at their source. First of all, because there
will always be losses. Then because more than a third (35.2%) of the climate impact of fertilizers occurs
at the time of their manufacture6 . Finally, because reducing these losses will require investments for farmers to purchase precision farming equipment and an adaptation of their practices, which will not allow
them to reduce their consumption of water beyond a certain threshold. chemical inputs, which will waste
precious resources of time and money to achieve a Europe massively converted to organic agriculture in
the long term.
- Contrary to what is claimed by hastily repeating the conclusions of certain studies (from USDA, JRC,
University of Wagningen) established on the "farm to fork" strategy, a Europe entirely converted to organic farming in no way threatens the continent's food security, on the contrary. In fact, the reduction of
the use of synthetic inputs should be compared with several elements: a/ the probable increase in yields
from agroecology as progress is made in agronomic research and the return of biodiversity to the plots,
b/ the reduction of waste recommended in this strategy (which represents a third of what is produced), c/
the reduction in the consumption of animal proteins for reasons of public health which will make it possible
to considerably reduce the need for volume of cereals produced (today Today, 2/3 of arable land, excluding permanent meadows, is cultivated to feed European livestock). The yields of European agriculture and their adequacy with food needs, within the framework of this strategy, must therefore be
considered in a global, system-wide approach.
- The fertility of farms will not be degraded if practices relating to organic farming (which specifically do
without synthetic fertilizers) are encouraged (culture of legumes, soil cover, cultivation and burial of green

manures, use of compost, mixed crop-breeding, etc.). This therefore means that the European Commission's action plan must not only create new regulatory provisions, but also provide financial and
training support for farmers to adopt these practices and structure legume sectors in particular.
- There are agroecological transition scenarios from which the European Commission can draw inspiration, and in particular the Ten Years For Agroecology (TYFA-GES) scenario from IDDRI, which
traces a transition path for 2050 while guaranteeing food security of the European population.
https://www.researchsquare.com/article/rs-1007419/v16
Machine Translated by Google
3. The proposals of Friends of the Earth France on the action plan
implemented by the European Commission:
7 21 environmental, citizen and peasant organizations: “Agricultural crisis and food crisis:
• The proposals put forward by Friends of the Earth France and by 20 other
French organizations7 to reduce dependence on synthetic fertilizers:
A. Adopt a path to reduce the consumption of synthetic fertilizers
B. Put in place instruments to reduce the consumption of synthetic fertilizers
in agricultural production, by establishing in particular a cap on the quantity of nitrogen per hectare, and by making
compliance with the trajectory set by the Nitrates Directive and the Water Framework Directive a criterion for validating
national strategic plans of the PAC.
- This ceiling must be 140kg of organic and mineral nitrogen per hectare.
- Finance advice and training for farmers to limit the overuse of fertilizers (50% of what is spread on average), as well
as the purchase of organic fertilizers, and green manure which can be buried and substituted to synthetic fertilizers
for the next
- Implement a directive on the use of synthetic fertilizers to reduce their use
.
- Establish a tax on the profits of fertilizer producers and on traders of cereals and animal products to finance support
measures for farmers and support their transition to agroecological practices. This tax would take the example of the
tax proposed by the European Commission on energy companies in a context of rising energy prices, in order to allow
States to help the most vulnerable households to cope.
campaigns.
an alternative is possible. Concrete measures to respond to the consequences of war and guarantee food sovereignty to countries in the North and South” (March 2022), available here:
https://www.amisdelaterre.org/crises-agricole-alimentaire-alternative-possible/
Machine Translated by Google
ÿ In the CAP 2023-2027, only validate the PSN of the Member States which will allow remuneration by the eco-scheme of 20% of areas in organic farming in 2027, in order to have a trajectory consistent with the objective of 25 % of areas in organic farming in 2030 provided for by the Green Pact.
D. Support and coordinate Member States towards an exit from industrial livestock farming in order to reduce 80% of the use of synthetic fertilizers and reduce livestock effluents, sources of numerous pollution:
ÿ Implement a support plan to relocalize the production of animal feed by articulating it with the strengthening of a link to the ground in order to achieve a number of animals consistent with the available agricultural areas of the territory.
ÿ Prioritize the reduction in the number of animals on farms that consume the most imported cereals, protein crops and oilseeds (poultry, pigs, dairy products) by supporting breeders in the transition (in particular by covering reduction costs) and sustainability of their

models over the long term.
C. Finance the development of alternatives to structurally change agricultural practices:
ÿ Implement a plan to support the development of extensive livestock farming, fed
to grass and allowing fodder autonomy
- Ask the Member States which produce the most meat and dairy products to reduce the size of their livestock (pigs and poultry in particular), to de-intensify it and make it less dependent on animal feed imports. Actions that could be implemented quickly are:
(produced with synthetic fertilizers) to feed animals.
ÿ Include the objective of 25% of Useful Agricultural Area in organic agriculture by 2030 in European law to make it a binding objective for Member States.
- Encourage Member States to establish a moratorium on the creation or expansion of above-ground and battery farms, heavily dependent on cereals or oilseeds
ÿ Financially support the farmers and breeders in greatest difficulty.
- Rapidly and massively implement the European Organic Action Plan by financing it with part of the 500 million euros for emergency aid to the agricultural sector:
- Finance an ambitious European plan for the production of legumes, which is focused primarily on human food.
- Articulate all emergency aid paid with the necessary transition of agricultural systems towards more sober, more autonomous production systems, and linked to the soil. Especially :
Machine Translated by Google
- Develop research and innovation on alternatives to synthetic fertilizers:
ÿ Define integrated fertilization management at European level and implement it
alternatives to the use of synthetic fertilizers
- Set a reduction objective for synthetic nitrogen fertilizers per hectare of UAA. This objective must aim for a 30% reduction in synthetic nitrogen fertilizers between 2018 and 2030, in accordance with the reduction trajectory proposed by the TYFA-GES model.
ÿ Accompany, financially and technically, these emergency measures with a European adaptation and debt reduction plan to reduce the livestock of above-ground livestock and to adopt more ecological practices for crops that are highly dependent on inputs.
This can, for example, involve less renewal of livestock, the early culling of some animals, or even technical support for the implementation of agroecological practices.
- Validate the integration of synthetic fertilizers into the Carbon Border Adjustment Mechanism.
ÿ Include the objective of the “Farm to Fork” Strategy to reduce nutrient losses by at least 50% as well as the use of fertilizers by at least 20% by 2030.
ÿ Mobilize Horizon Europe funds on the development of agronomic innovations
- Establish an ambitious European plan with appropriate funding for the development of European protein autonomy (protein plan)
compromise biosecurity requirements
- Implement regulations on the sustainable use of synthetic fertilizers:
ÿ Regulatorily facilitate the use of organic sources of nitrogen without
notably via the national strategic plans of the CAP
- Condition aid from the national strategic plan of the CAP (Common Agricultural Policy) to stop subsidizing monocultures, short-term rotations and intensive industrial livestock farming and finance farmers in the diversification of their activities (grass-based farming and production of legumes for human and animal consumption).
• The proposals put forward by the Les Verts/ALE8 group which are
supported by Friends of the Earth France:
8 Claude Gruffat and Benoit Biteau (Les Verts/ALE): “Synthetic fertilizers: a climatic and social burden”, available here: https://fr.calameo.com/books/00700985087fa57822f8b
Machine Translated by Google
4. Appendices from the Friends of the Earth France report on the
establishment of a fee on the purchase of synthetic fertilizers9 :
https://www.amisdelaterre.org/wp-content/uploads/2021/06/redevance-engrais-azotes-juin-2021.pdf9
Machine Translated by Google
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F3250308
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Submitted by
Pierre SULTANA
User type
Non-governmental organisation (NGO)
Organisation
FOUR PAWS / VIER PFOTEN
Organisation size
Large (250 or more)
Transparency register number
69150873293-75
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

FOUR PAWS welcomes the initiative from the European Commission for a more sustainable management of nutrients. Given that more than 60% of European land is used to produce feed for farm animals, livestock farming is a significant part of the challenge and can also offer solutions if the necessary changes are encouraged. For this reason, we are glad to provide more feedback on the call for evidence in the attachment.

FOUR PAW'S
Animal Welfare. Worldwide.
requirement for nitrogen fertiliser. Pulses maintain soil productivity and fertility such as increased soil organic carbon, humus content and N and P availability. This is because they increase soil microbial activity due to the different biochemical composition. Studies on the use of protein crops as pre-crops for rapeseed showed average yield increases of 15%, owing to improved soil quality. These environmental considerations should enhance targeted financial support for protein crops for example as part of a soil erosion reduction or nitrogen reduction plans.
To produce the same amount of protein, legumes require less land, less water, lower pesticide and herbicide inputs, and lead to lower greenhouse gas emissions than animal derived sources.
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Zander, P., Amjath-Babu, T.S., Preissel, S., Reckling, M., Bues, A., Schläfke, N., Kuhlman, T., Bachinger, J., Uthes, S., Stoddard, F., Murphy-Bokern, D., Watson, C. (2016). Grain legume decline and potential recovery in European agriculture: a review. Agronomy for Sustainable Development 36:26. Retrieved from: https://link.springer.com/article/10.1007%2Fs13593-016-0365-y

FOUR PAW'S
Animal Welfare. Worldwide.
Contribution to the call for evidence for a EU Action Plan for a better management of nutrients
FOUR PAWS welcomes the initiative from the European Commission for a more sustainable management of nutrients. Given that more than 60% of European land is used to produce feed for

farm animals, livestock farming is a significant part of the challenge and can also offer solutions if the necessary changes are encouraged. Specifically, the EU food chain should transition from conventional industrial farming to sustainable forms of farming that do not depend on added fertilizers but take advantage of the synergies between animals, crops and soil.

Impact of livestock farming on nutrient pollution

Livestock farming contributes to the high levels of nutrient pollution in two ways: through manure spreading and by requiring the use of vast amounts of fertilizers (manure and mineral fertilizers) to produce enough feed to sustain their production. For instance, in Germany the nitrogen soil surface budgets of the German Environment Agency' show that districts in Lower Saxony and North Rhine-Westphalia with intensive livestock farming continue their increase in nitrogen. For Lower Saxony, the surpluses of nitrogen are at 108 kg per hectare, significantly higher than the average German levels.

The same data also highlights that the average nitrogen surplus has remained the same for more than 20 years, at 77 kg per hectare. This is not exclusive to Germany, as the agricultural sector accounts for 60% of the global emissions of nitrous oxide a GHG 265-298 times more damaging than CO2. The main driver of these emissions is the use of nitrogen fertilizers that are needed under conventional farming due to the poor health of soils and to keep up with the demand for feed for livestock. Indeed, livestock farming is calculated to contribute to 80% of soil acidification and air pollution through nitrogen and ammonia emissions. In intensive poultry farming, high stocking densities lead to greater litter moisture, increased microbial activity, increased temperature and ammonia concentration. High ammonia concentrations can cause irritation (such as keratoconjunctivitis) in the eyes and respiratory system, increasing the susceptibility to respiratory disease and recourse to antibiotics. Several studies have analysed these negative effects on public health and linked them to intensive livestock production. The risk to develop respiratory diseases (chronic obstructive pulmonary disease, pneumonia, asthma and acute deficits in lung functions) have been found to increase for the population living near facilities used for intensive rearing.

Umweltbundsamt. (2019). Nitrogen surplus from agriculture has been excessive for 20 years. https://www.umweltbundesamt.de/en/press/pressinformation/nitrogen-surplus-from-agriculture-has-been

Reay, D., Davidson, E., Smith, K. et al. (2012). Global agriculture and nitrous oxide emissions. Nature Climate Change 2, 410-416. https://doi.org/10.1038/nclimate1458

Adrian Leip et al. (2015). Impacts of European livestock production: nitrogen, sulphur, phosphorus and greenhouse gas emissions, land-use, water eutrophication and biodiversity. Environmental Research Letters 10. https://iopscience.iop.org/article/10.1088/1748- 9326/10/11/115004/pdf

* Smit, L., Heederik D. (2017). Impacts of Intensive Livestock Production on Human Health in Densely Populated Regions. Geohealth. https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2017GH000103

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F3250299
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User type
Other
Organisation
CIBE - International Confederation of European Beet Growers
Organisation size
Micro (1 to 9 employees)
Transparency register number
89930126483-54
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

CIBE, the International Confederation of European Beet Growers, welcomes the opportunity to provide feedback to the European Commission's call for evidence regarding the initiative "Nutrients – action plan for better management", with the ambition to develop an integrated nutrient management action plan which will look at the entire nitrogen and phosphorus cycles, covering all environmental media and all relevant sources of pollution. Please find attached CIBE's feedback.

International Confederation of European Beet Grower
CONFEDERATION INTERNATIONALE
DES BETTERAVIERS EUROPEENS
*
CONFEDERAZIONE INTERNAZIONALE
DEI BIETICOLTORI EUROPEI
INTERNATIONALE VEREINIGUNG
EUROPÄISCHER RÜBENANBAUER
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CIBE Feedback on the Commission Initiative
"Nutrients – action plan for better management"
CIBE welcomes the opportunity to provide feedback to the Call for Evidence regarding the Commission
Initiative "Nutrients – action plan for better management".
First and foremost, CIBE would like to point out that from the germination of a sugar beet seed to the end of the vegetative phase of a sugar beet (at which point the crop is harvested, unless it is being grown
for the production of beet seed), the sugar beet plant grown from a seed weighing 0.03 grammes to a plant with a 1 kg root. To achieve this 33 000-fold increase in weight (or 7 700-fold increase in dry

matter weight), the plant requires sufficiently high temperatures, enough water and not least appropriate
and sufficient nutrients. Nutrients are provided as much as possible by the soil in which the crop is grown but need to be supplemented by optimal application of fertiliser according to the nutrients in the
soil available to the plant and the crop's nutrient requirement.
CIBE therefore underlines that any action plan on integrated nutrient management should recognise the
fundamental need of crop plants for adequate nutrient supply throughout their growth.
Furthermore, a comprehensive overview of the practices/systems already in place which ensure an appropriate and targeted use of fertilisers (including but not limited to Nitrogen (N) and Phosphorus (P), would be helpful in the orientation of such an action plan on integrated nutrient management by building on what is already practiced in the field. In this context, CIBE would like to recall that for example in France, the use of mineral N fertiliser has been reduced from around 160 kg/ha in the 1980s
to less than half that amount in the 2010s. In addition, the Azofert module, introduced in 2017, dynamically applies the N-balance method by determining more precisely the amount of N which needs
to be applied (i.e. based on measurements and information on the nutrient supply from the soil, including
residues from preceding crops and nutrients provide by intermediate crops), leading to further reductions in applications of N fertiliser. Similarly effective tools have been used, in some cases for over 30 years, in other sugar beet growing countries, such as "Stikstofbemesting" in the Netherlands (where N-application per hectare was reduced by over 20% in the past 20 years), the "Module fumure azote minerale/ Minerale Stikstofbemesting" in Belgium, the Electro-Ultrafiltration (EUF) method in South Germany and Austria (where application of N and P fertiliser per hectare has been more than halved since the 1980s), advice on balanced fertiliser use ("Afbalanceret gødskning", "Balanserad gödsling" & "Tasapainoinen lannoitus") in Denmark, Sweden and Finland.
With regards to oversupply of P in agricultural soils, it is worth recalling that this problem is not widespread across the EU but limited to certain Member States and then further limited to certain regions in those Member States. Indeed, in many regions of the EU, agricultural soils are in fact undersupplied with P.
Taking into account the progress made so far in the increasingly targeted application of fertiliser (and not only N and P, but also other macronutrients (for which the crop's nutritional needs are expressed in
kg/ha) Potassium (K), Magnesium (Mg), Sulphur (S) and Calcium (Ca), as well as micronutrients (for which the crop's nutritional needs are expressed in kg/ha), such as Boron (B), Manganese (Mn), Iron (Fe), Copper (Cu) and Zinc (Zn), CIBE is in principle in favour of an action plan and/or initiative which
can lead to further improvement in the use of fertilisers, be it via further benefits on crop yield and quality and/or further improvement in soil structure and soil nutrient status (with in turn a positive

impact and crop yield and quality, possibly hand in hand with lower requirements for fertiliser application since more nutrients are being supplied by the improved soil) and/or further lowering/avoidance of environmental impacts. However, these products and/or techniques must be available, safe, effective and affordable to growers. In this context, precision farming and notably precision fertiliser application (the right dose of the right fertilizer at the right time), is efficient and popular with growers, but requires very significant investment in operations, which is currently what prevents its large-scale adoption and deployment. It is therefore essential to support innovation in precision agriculture (on-board sensors, robotics, etc.) but it is even more essential to support financially
the widespread acquisition and use of such equipment in agriculture. In CIBE's view, this is an absolute
necessity for the success of the ambitions of the Green Deal on the subject of fertiliser use.
Last but not least, innovative breeding techniques, such as for example New Genomic Techniques,

which might contribute to developing crop varieties which use the available nutrients more efficiently and thus will ultimately require less fertiliser application per unit crop produced, should not be overlooked but on the contrary be supported urgently. Therefore, a positive signal for R&D on NGTs should be provided by the EU Commission and the co-legislators as soon as possible, be it through legislative proposals such as the ongoing initiative “Legislation for plants produced by certain new genomic techniques” and the pending Sustainable Pesticide Use Regulation (SUR) and/or via Horizon Europe and/or the agricultural European Innovation Partnership (EIP-AGRI).

Feedback reference
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Submitted by
Rafael Heredero
User type
Business association
Organisation
EurEau
Organisation size
Micro (1 to 9 employees)
Transparency register number
39299129772-62
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

EurEau is the European Federation of National Associations of Water Services and is therefore very much involved in environmental topics and welcomes the holistic nutrient management approach proposed by the European Commission in order to address the nitrogen and phosphorus cycles. Drinking water resources are tremendously impacted by the loss of nutrients mainly coming from agricultural practices polluting drinking water resources (groundwater, surface water) as reminded in the Nitrates Directive report mentioned in the outline. On the other side of water services, waste water is both a barrier and, partially, a pathway for nutrients into the environment. Driven by the UWWTD waste water treatment is already reducing nutrient losses by more than 70%, captured in sewage sludge or, partially for nitrogen, released into the atmosphere. However, the main source of nutrient pollution remains agriculture and we regret that no consideration to revise neither the Nitrates Directive, stemming from 1991, nor to prepare ambitious CAP strategic plans by the Member States are under way. We would also welcome more support to facilitate recovery and reuse of nutrients captured during the waste water treatment. Phosphorus is on the critical raw materials list for Europe. However, nutrient recovery, especially from waste water treatment processes, is not emphasised. Recovering and reusing nutrients from waste water and sludge as part of a better nutrient management have multiple benefits. It reduces the climate impact of N fertiliser production, it helps solving potential future shortages of phosphorus and the use of “biosolids of high quality” (e.g. sludge and compost) plays a role in improving soil biodiversity and humus content for better adaptation to droughts. Moreover, the agricultural recovery of organic matter from household and from urban waste water, respecting sanitary and environmental conditions, creates local loops for phosphorus and nitrogen recovery. To maximise benefits, the action plan on nutrients should therefore promote recovery and reuse of nutrients from waste water. The new Fertiliser Product Regulation has already created an End-of-Waste status for recovered nutrients in some product categories. The confidence in recovered nutrients will be enhanced if the quality of biosolids and recovered materials is protected through a strong control at source by avoiding polluting substances to enter the waste water collection systems (through legal instruments like REACH and IED, and financed by extended producer responsibility schemes). However, to optimise the recovery, investments need to be supported by the market which will be created by the reuse of these recovered products. As it is not happening today, reuse should be supported through a pull in

the market. This could be achieved, for example, by introducing compulsory requirements to blend a certain ratio of recovered P and N in all mineral fertiliser in the EU – a system very much a like the compulsory 5% ratio of ethanol blended in petrol sold in the EU. We hope the promising action plan on nutrient management will address all aspects of nutrient management, from the application on land to the reuse, including GHG emissions. This is crucial to support the sustainability of water services and the independency of European agriculture in a safe environment. Water Matters.

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Public authority
Organisation
Ministry of Food, Agriculture and Fisheries of Denmark
Organisation size
Large (250 or more)
Scope
National
Level of governance
Authority
Country of origin
Denmark
Initiative
Nutrients – action plan for better management

For this initial call for evidence, the Ministry of Food, Agriculture and Fisheries of Denmark provides a collection of initial thoughts, points of attention and topics with relevance to the Ministry's responsibilities in Denmark.

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April 26 2022
Answer to Call for evidence on "Nutrients – action plan for better management"
This note provides input to the "call for evidence for an initiative (without an impact assessment)" on the forthcoming action plan for better management of nutrients. The action plan is announced in the circular economy action plan, the farm to Fork Strategy and the Biodiversity strategy. The Commission
will draw up an integrated nutrient management action plan to help reduce nutrient losses by at least 50%, while ensuring that there is no deterioration in soil fertility. The action plan will complement the zero pollution action plan for air, water and soil.
For this initial call for evidence, the Ministry of Food, Agriculture and Fisheries of Denmark provides a
collection of initial thoughts, points of attention and topics with relevance to the Ministry's responsibil-
ities in Denmark.
Points of attention
Main considerations
- Overall, the Ministry welcomes the action plan and its objectives.
- The action plan should build on the already launched initiatives and comprehensive action plans developed with respect to e.g. the EU Nitrates Directive and Water Framework Directive, as they already contribute to reducing nutrient losses to the environment.
- The efforts in the action plan should take into account national efforts that are already implemented
- In the Danish implementation of the above mentioned EU directives, the level of ambition is already high. Just to mention some key elements:
  - Danish farmers need to account for all sorts of fertilizer types (not "only" for livestock manure and chemical fertilizers, but also sewage sludges, ashes, digestates and other organic fertilizer types) in the obligatory fertilizer registry and accounting system.
  - Nutrient content in livestock manure is well-defined in standardized and frequently up-

dated nutrient excretion norms.
o Fertilizer norms for all types of cultivated crops are binding and limit a farms total use of all types of fertilizers, both with respect to nitrogen and phosphorus.
o There is a general obligation to establish catch crops on a share of the otherwise uncultivated area for all farms and supplementary targeted catch crops schemes demand more catch crops (or alternatives) in selected catchment areas, where extra nutrient load reductions are necessary to live up to the obligations of the Water Framework Directive. These catch crops keep nutrients within the agricultural system.

- The efforts in the action plan should take into account other national efforts. As a first step, the Commission should ensure that existing EU environmental and climate legislation is fully implemented and enforced. The relevant national efforts include:

o the greening requirements in the CAP,
o the nature conservation efforts,
o the climate goals and
o the efforts to recycle nutrients, cf. Regulation 2019/1009 on EU fertilizer products.

2

- It is of outmost importance at what level (i.e. nationally or EU-scale) and how the 50% reduction target for nutrient losses is calculated. Determination of nutrient loss should not solely be based on the EUROSTAT Gross Nitrogen Balance (GNB) as an indicator. Other factors should be included in the calculation, including e.g. the efficiency of crop nutrient utilization and the soil's nutrient needs to maintain fertility. There is also a whole list of measures to reduce actual nutrient losses to the environment, which do not influence the balance. A balance will always just give an indication of the potential loss of nutrients, but not the actual loss. Some of the major draw backs of focusing on a balance indicator are the following:

o Catch crops are one of the examples, which basically do not affect the balance (as they are neither fertilized or removed), but certainly efficiently retain nutrients within the agricultural system and hence reduce losses.
o When agricultural land is taken out of production (e.g. for nature or peatland conservation purposes), nutrient losses to the respective aquatic environment will inevitably be reduced. As the majority of methods to calculate nutrient balances only takes “agricultural land” into account as reference area, the balance will remain unchanged (or even increase, as intensive agricultural production might be intensified on areas with minimal risk for losses to the environment, while other areas are taken completely out of production).

- If actual measurements of nutrient concentration and load in the aquatic environment are applied as an indicator to follow the progress in the initiative, it has to be kept in mind that significant delays of years to decades can occur before the effects of nutrient reducing measures can be detected in the recipient water body.
- A technical report from the Commission (Technical report JRC121368, EUR 30317 EN, 2021. Modeling environmental and climate ambition in the agricultural sector) proposes an approach to achieving the GNB reduction target with the imposition of mandatory, progressive reduction targets, taking into account the GNB level in the individual Member State where the reduction factor is determined by the size of the GNB surplus in the base year. According to EUROSTAT, the GNB average for EU27 is 46 kg N/ha, while Denmark has an estimated GNB surplus of 83 kg N/ha (reference year 2012-2014). According to this model, Denmark would have to achieve a higher reduction target than other Member States. Such a simple calculation of the reduction target seems inappropriate. It should be up to the Member States themselves to designate and apply the right method to demonstrate the target reduction effect and to demonstrate the status of the nutrient balance. In addition, Member States' historical reductions in nutrient losses and national disparities should be taken into account. In a Danish context, the use of the baseline year 2018 will mean a significant addition to the already implemented nitrogen efforts. As demonstrated in the national monitoring reports (only available in Danish), the national Nitrogen balance on agricultural land has been reduced by approximately 40% since the early 1990’ies. This large reduction was mainly achieved by reducing application of artificial fertilizer while increasing nutrient use efficiency in the organic fertilizers such as livestock manure. Yield

levels could be maintained or increased and losses to the environment have already been reduced considerably. These factors should be taken into account when setting the Danish target for meeting the EU reduction target by 2030. Denmark will live up to its EU obligations and continue to reduce nutrient losses to the environment in the future. That being said, it appears unrealistic to achieve a reduction by 50% on top of the historically achieved reductions.

- In the EU, the Commission's Management Committee for Fertilizer Products proposed the following initiatives to alleviate delivery difficulties and high prices for commercial fertilizers:
  - Target of reducing mineral fertilizer use by 20% by 2030
  - Precision farming and mixed farming practices (legumes)
  - Bio-based alternatives and nutrient recovery
  - Green ammonia

3
Recommendations

- From the Danish side, it can be proposed that the following initiatives are included in the action plan:
  - The EU Commission should be encouraged to support initiatives on precision fertilization, which have a documented effect on reduced leaching, including ex. use of GPS positioning and robotics, so that fertilizers assigned to the crops are optimally absorbed by the plants and not lost to the environment. In this context, the Commission should work for an EU standardization of data formats from agricultural machinery for data sharing with the EU paying agency and control authority.
  - Facilitation of exchange of 'best practices' in relation to targeting of fertilizer application, including on support of precision agriculture.
  - Improve methods for optimizing feeding and nutrient utilization in livestock production
  - Promote the opportunities to support targeted nutrient regulation, including increasing cost-effectiveness e.g. by being able to compensate for effect achieved rather than per area encompassed
  - Promote the opportunities to exploit synergies across nutrient loss reduction and climate change mitigation and adaptation efforts.
  - Develop new types of fertilizer products for the recycling of nutrients in agriculture and nutrients from other organic by-products, cf. the circular economy

In the consultation, the Commission points out that there is no need for an actual impact assessment for
the action plan. However, it can be argued that the Commission should already now be working on an impact assessment of proposals for initiatives in the forthcoming action plan.

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Submitted on
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Submitted by
Cecilia Dardes
User type
Business association
Organisation
Fertilizers Europe
Organisation size
Small (10 to 49 employees)
Transparency register number
80788715017-29
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

Fertilizers Europe welcomes European Commission's initiative to provide a comprehensive framework to ensure a more sustainable and efficient use of nutrients throughout and would like to thank for the opportunity to provide our feedback. Fertilizers Europe represents the interests of the majority of mineral fertilizer manufacturers in the European Union. The association's membership comprises 16 fertilizer manufacturers from countries across the Union and eight national fertilizer associations. The association communicates with a wide variety of stakeholders, institutions, European and national policy-makers and members of the general public who seek information on fertilizer products and application technology, and topics relating to today's agricultural, environmental and economic challenges. Please find attached Fertilizers Europe's feedback.

Nutrients – Action Plan for a Better Management
European Commission Call for Evidence for an Initiative
The Fertilizers Industry welcomes the European Commission's initiative to provide a comprehensive framework to ensure a more sustainable and efficient use of nutrients throughout the EU territory. Nutrients represent a primary need for crops to grow, and plants take up these nutrients in the form of minerals irrespective of their origin, which might be organic or inorganic. The only goal of fertilizers application is to provide plants with all the nutrients they need to grow to their full potential. In order to do so, ensuring a balanced level of fertilization through an effective management of nutrients is critical to avoid under or over-supply.
The importance a balanced fertilization is even more evident if we consider that today about 50% of the world's population has access to food thanks to the use of mineral nitrogen fertilizers. Taking into account the additional future growth in global population and the crucial role and moral obligation that Europe has in doing its part to contribute to global food security challenges, it is important to leave idealistic narratives aside and shift the focus of attention on the need to provide farmers with the right tools and conditions to achieve a balanced level of fertilization.
The Nutrient Management Action Plan represents an opportunity to further incentivize sustainable nutrient management at farm level. Nevertheless, in order to build an enabling EU policy framework, the following aspects should be taken into account.
1. Circular Economy
The fertilizer industry works to optimise the use of resources and it already recycles a wide range of by-products in its production process, turning them into valuable plant nutrients; it uses surplus of energy and raw materials that derive from other production processes on fertilizer production sites

or from production process taking place elsewhere. The industry is committed to become even more important as a recipient and user of such products. Nevertheless, the need to transform our economic system into a circular one must not result in a race for recycling, which does not take into consideration some fundamental scientific caveats.

The current trend that identifies an enhanced use of bio-based fertilizers as the way forward - not only to reduce the EU dependence from Russia but also to reduce the carbon footprint of agricultural production and comply with the EU climate targets – should take into account that half of the nutrients currently applied to European croplands are already being recycled from waste streams, and manure accounts for more than 90% of this recycled flow.

Nevertheless, half of the food production at EU and global level still depends on mineral fertilizers. Furthermore, that large quantities of manure applied to land is not being utilized as effectively as it should, eventually resulting in large environmental leakages1.

As underlined in the related JRC study, action is still needed to ensure that the on-going technological and market developments for the recycling of nutrients in a circular economy can be reconciled with the objective of protecting water bodies against pollution originating from livestock manure2.

Lastly, it must be considered that using manure as a sole source of Nitrogen may limit overall manure-N efficiency. Applying manures at reduced rates over a larger crop area, using N fertilizer at times when crop recovery of manure may be limited, may give the greatest overall manure-N efficiency3. Furthermore, the nutrient content of manure depends on several factors and it is not predictable without a prior analysis. Hence, the application of manure as a sole source of nitrogen does not respect the basic principles of a balanced fertilization.

Therefore, to unlock the full potential of the circular economy and industrial symbiosis, new policies and R&D programmes are needed to incentivize further industrial symbiosis and promote circular thinking, to ensure further optimization of resource use, closing material loops and minimizing environmental impacts.

2. Integrated approach

The fertilizers industry sees mineral fertilizers as a complement to organic fertilizers: farmers should always be encouraged to use their manure first and then supplement with mineral fertilizers to get the right balance between nutrients. The final objective must be to achieve optimal plant growth which increases nutrient use efficiency and limits losses to the environment. Just using concentrated manure without looking at the right nutrient balance does not make economic nor environmental sense.

Adaptive and efficient fertilization requires both mineral and organic fertilizers. Considering that nutrients have different characteristics, tailored managements strategies are the best way to ensure effectiveness and at the same time reducing nitrogen and phosphorus losses by 50%4.

The introduction of a precision factor in the application of fertilizers is the best way to ensure optimised fertilization.

The nutrient management action plan should foresee management strategies interlinked and structured considering one another’s complementarity, in order to achieve the ultimate goal of efficient fertilization.

1 Prof. Allan Buckwell and Dr. Elisabeth Nadeu study “Nutrient Recovery and Reuse (NRR) in European
Agriculture”

2 JRC, Technical proposals for the safe use of processed manure above the threshold established for Nitrate
Vulnerable Zones by the Nitrates Directive (91/676/EEC)

3J. Webb et al. “Study on variation of manure N efficiency throughout Europe”

4 Wageningen Economic Research “Impact assessment of EC 2030 Green Deal Targets for sustainable crop
production” (Report / Wageningen Economic Research; No. 2021-150)..

3. One size does not fit all

The European territory is characterized by significant differences in terms of territory, climate conditions, crops, number of animals etc.

This entails that the differences between required, actual and critical N inputs vary considerably between the different regions in Europe5. There is no “one size fits all” regarding nutrient

management as fertilization is site and crop-specific
Fertilizers use should not be dictated by questionable and idealistic targets aimed at gaining the consensus of the public opinion, but rather by effective and scientific analysis of the level of nutrients – both from organic and mineral sources – needed to achieve the optimal level of fertilization mentioned above.
Therefore, such reductions should be calculated taking into consideration Region-specific and crop-specific situations. The EU action plan should promote best suitable measures for single local conditions.

4. Indicators

The goal of nutrient management should be to improve the overall sustainability of farming systems considering economic, environmental and social aspects.
Nutrient Management is not just about the quantity of nutrients (coming from both organic and/or mineral fertilizers), but rather about the nutrient use efficiency (NUE), which considers not only the quantity applied but also the production level.
The concept of Nitrogen Use Efficiency (NUE) describes the relationship between nitrogen supply to a
crop and nitrogen removal from the field by the harvest. It represents the percentage of the nitrogen contained in the crop (kg) of the nitrogen applied (kg).
To improve Nutrient Use Efficiency, it is crucial to have a set of harmonized standard indicators available at EU level.
The EU Nitrogen Expert panel developed the Nitrogen Use Efficiency indicator6, which is based on the
mass balance principle by using nitrogen input and nitrogen output. This indicator provides information about resource use efficiency the economy of food production (nitrogen in harvested yield), and the pressure on the environment (nitrogen surplus).
5 Wim de Vries and Lena Schulte-Uebbing, “Required changes in nitrogen inputs and nitrogen use efficiencies to
reconcile agricultural productivity with water and air quality objectives in the EU-27”
6 www.eunep.com
It’s a tool that allows farmers and decision-makers to examine differences between fields, farms, farming systems, and between years. It is a simple indicator, which can be adapted to site and crop-specific conditions and takes efficiency as well as environmental aspects into consideration. Such an approach would reward farmers for continuous, progressive improvement of their NUE at farm level. The advantage of such an indicator is that it could easily be compared with local/standard values, and so leads to a corridor of good practices.
The EU action plan should promote the effective use and development of indicators such as the Nitrogen Use Efficiency Indicator. Also, comparability of calculations at EU level should be ensured.

5. Solutions to improve Nitrogen Use Efficiency

The digitalization of European agriculture represents an important driver to boost effective nutrient management in Europe and optimise the use of fertilizers. The basics of good fertilization are well summarized by the 4R principle: right product, right rate, right time and right place.
The development and promotion of digitalization techniques will result in an enhancement of soil knowledge at farm level that will eventually lead to a balanced fertilization level: farmers will be able to measure the level of nutrients in their soil and apply fertilizers only when and where needed. This will help to decrease the environmental footprint of plant nutrition processes – both from organic and mineral fertilizers - while ensuring a viable food production level.
The fertilizers industry is committed in developing a closer relationship with farmers, adapting its distribution channels to supply farmers with practical tools, advice and services they need to develop effective nutrient plans at farm level. Integrated in programs to make a more efficient use of nutrients should be promoted and reflected also in the National Strategic Plans.
To fully unlock the potential of digitalization, the nutrient management action plan should ensure that farmers have access to the latest digital tools and technologies and that legislative deadlocks do not represent an obstacle to the collection of the data needed.
In addition to precision farming and digitalization, other practices and tools such as fertigation, enhanced efficiency fertilizers and biostimulants, used in targeted cases and in optimal conditions,

can help to improve NUE.

6. Impact assessment

The different studies7 conducted on the impacts that the targets set by the Farm to Fork strategy will have, highlighted several impacts, trade-offs and blind spots that have to be taken into account. As the JRC study pointed out, the nutrient surplus reduction target has a significant impact in terms of production reduction. Therefore, special attention must be paid on how the target is implemented.

7 https://www.fas.usda.gov/newsroom/economic-and-food-security-impacts-eu-farm-fork-strategy
https://hffa-research.com/wp-content/uploads/2021/05/HFFA-Research-The-socio-economic-and-environmental-values-of-plant-breeding-in-the-EU.pdf
https://publications.jrc.ec.europa.eu/repository/handle/JRC121368
https://grain-club.de/fileadmin/user_upload/Dokumente/Farm_to_fork_Studie_Executive_Summary_EN.pdf

Every future action that will arise from the EU Nutrient Management Action Plan will have to be accompanied by a thorough impact assessment that will take into account the environmental and economic aspects – such as the impact on food production and EU import needs - in coordination with all the other measures foreseen at EU level and their cumulative effects.

This will be crucial to understand the implications of such actions in an integrated manner and to identify realistic objectives that will not ultimately lead to yield losses and deterioration of soil fertility due to an outsource of production to regions with lower standards. It will also help delivering a long-term policy that balances the EU's climate ambitions with its industrial competitiveness.

Feedback reference
F3250273
Submitted on
26 April 2022
Submitted by
Giulia Cancian
User type
Business association
Organisation
European Biogas Association
Organisation size
Micro (1 to 9 employees)
Transparency register number
18191445640-83
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

European Biogas Association's reply in the uploaded file

NUTRIENTS ACTION PLAN FOR A BETTER MANAGEMENT
26/04/2022
CALL FOR EVIDENCE REPLY
Nutrients – action plan for better management
The European Biogas Association welcomes the European Commission's commitment to draw up an integrated nutrient management action plan to help reduce nutrient losses by at least 50%, reducing the
use of fertilisers by at least 20%. while ensuring that there is no deterioration in soil fertility and stimulating the market for recovered nutrients. An integrated nutrient management plan should adopt a systemic approach, tackling misalignments with the Circular economy actions Plan. Currently, the use
of mineral nitrogen (N) fertilizers in the European Union (EU) agricultural sector corresponds to 10.2 million tons of N consumed in 2018, increased compared to 10 years before. Mineral fertilizers are energy
intensive; with synthesis of NH3, based on the Haber-Bosch process being responsible for about 2% of
the world's energy consumption and 2.5% of the global fossil-fuel-based carbon dioxide emissions.1
The concept of a circular economy highlights the importance of nutrient recovery and aims at preventing
environmental impacts such as soil acidification and eutrophication of water bodies, and release of greenhouse gases (GHG). The Fit for 55 includes EU-wide binding targets to cut GHG emissions by at least
55% and increase the share of renewable energy by at least 40% in the final consumption by 2030.
Anaerobic digestion (AD)—which produces renewable power, heat, and fuel from organic waste—will
play a key important role in achieving the goals. However, AD will also play a crucial part in the sustainable management of organic waste streams such as
manure by simultaneously providing renewable energy,
closing nutrient loops, and reducing GHG emissions.
Digestate, a co-product of biogas production used as organic
fertiliser, has the potential to transform Europe's agricultural
sector offering an alternative to commonly used chemical

fertilisers. such as nitrogen, are fully preserved in the AD process.

The adoption of the new Fertilising Products Regulation (FPR) ((EU) 2019/1009) includes organic and waste-derived fertilisers under the EU internal market. However, FPR is a product regulation and in itself does not consider limitations or constraints on product application. More specifically, under the current definitions of the Nitrates Directive, those products derived from processed manure retain the legal status of animal manure, including the restrictions that come with it such as the current limit of 170 kg N ha−1 y−1 in Nitrate Vulnerable Zones applies to any fertilising product derived from livestock

1 Saju et al (2022) Applied Sciences | Free Full-Text | Digestate-Derived Ammonium Fertilizers and Their Blends as Substitutes to Synthetic Nitrogen Fertilizers (mdpi.com)

manure. Consequently, this threshold negatively impacts the use of bio-based fertilising materials such as digestate based on (co-)digested animal manure, although this often bears no resemblance to the manure from which their nutrients were extracted, as they can contain high amounts of mineral N (Nmin), effectively bringing them closer to chemical fertilisers in terms of plant nutrient uptake. As regulation was not updated with the latest technicaladvancements, farmers tend to top up with energy-demanding chemical fertilisers as a result of the 170 kg N ha−1 y−1 limit not meeting most crop requirements.2

The European Biogas Association urges the European Commission to address the anachronistic requirements of the Nitrate Directive and allow digestate and recovered fertilizers to actively reduce the utilisation of chemical fertilisers, effectively closing the nutrient loop and enabling carbon storage. EBA is concerned that the Nitrates directive makes no distinction and defines livestock manure under article 2(g) as: “waste products excreted by livestock or a mixture of litter and waste products excreted by livestock, even in processed form”. This implies that all digestate from animal manure origin retains the status of animal manure in spite of its new “processed form” which increases nutrient use efficiency. The Nitrates Directive in its current form is based on the same definitions and wording (including Art. 2(g)) and does not take into account three decades of research & innovation and the technical advancement that allows manure refinery (a.o. via anaerobic digestion as key enabling technology) into fertilizing products that can act as technical alternatives to synthetic chemical fertilisers produced based on fossil resources (in casu, natural gas used to produced N synthetic fertilisers using the Haber-Bosch chemical process).The land application of organic materials needs to be carefully managed to maximize their crop available nutrient value and minimize their impact on the wider environment. Studies demonstrate that NH_3 emissions are on average lower for digested than untreated slurry due to a lower dry matter contents that increase the infiltration rate. N_2O losses are also generally lower when using digestate rather than raw slurry.3

Moreover, the role of digestate as a contributor to SOC build up should be considered4: organic matter in digestate can build up the humus content in the soil; this is a benefit unique to organic fertilisers which is particularly crucial for arid and semi-arid lands with low carbon content5

Contact

Giulia Laura Cancian – EBA Secretary General cancian@europeanbiogas.eu
2 Reuland et al (2021) Agronomy | Free Full-Text | The Potential of Digestate and the Liquid Fraction of Digestate as Chemical Fertiliser
Substitutes under the RENURE Criteria | HTML (mdpi.com)
3 Gaseous Nitrogen Emissions and Forage Nitrogen Uptake on Soils Fertilized with Raw and Treated Swine Manure - Chantigny - 2007 - Journal
of Environmental Quality
4 Reuland et al. (2022) Agronomy | Free Full-Text | Assessment of the Carbon and Nitrogen Mineralisation of Digestates Elaborated from Distinct
Feedstock Profiles | HTML (mdpi.com)
5 Digestate-paper-final.pdf (europeanbiogas.eu)
About the EBA
The European Biogas Association is the voice of renewable gas in Europe since 2009. EBA advocates the
recognition of biomethane and other renewable gases as sustainable, on demand and flexible energy sources that provide multiple knock-on socio-economic and environmental benefits. Supported by its members, EBA is committed to work with European institutions, industry, agricultural partners, NGOs
and academia to develop policies which can enable the large-scale deployment of renewable gases and organic fertilisers throughout Europe, supported by transparent, well-established sustainability certification bodies to ensure that sustainability remains at the core of the industry. The association counts today on a well-established network of over 200 national organisations, scientific institutes, and
companies from Europe and beyond

Feedback reference
F3250408
Submitted on
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Submitted by
Tabea Knickel
User type
Non-governmental organisation (NGO)
Organisation
Deutsche Phosphor-Plattform DPP e.V.
Organisation size
Micro (1 to 9 employees)
Country of origin
Germany
Initiative
Nutrients – action plan for better management

Sustainable nutrient management in agriculture and closing material cycles make an important contribution to resource protection. Good agricultural practice with needs-oriented fertilization, taking into account soil test results, is the basis for the production of healthy food and feed. The nutrient phosphorus, which is so important for plant growth, is a limited natural resource whose occurrence is not equally distributed across the globe. The war in Ukraine and the conflict with Russia and the resulting price developments in agricultural raw material markets show that Europe has become too dependent on imports in recent years. Russia is a supplier of a significant amount of raw material imports to Europe. The import share of raw phosphates from Russia is currently around 24% (Phosphatestein 2020, data source BGR 2021). It is therefore now important to reduce Europe's dependence on imports and strengthen the resilience of supplies and food security. The availability of phosphorus as an important plant nutrient is essential for this. Therefore, all possibilities should be exhausted to recover and reuse the nutrient phosphorus from all relevant material flows. A significant phosphorus recycling potential lies in recycling, in which phosphorus from municipal sewage sludge and other organic waste (e.g. animal by-products) are increasingly recycled. However, the majority of the phosphorus contained in sewage sludge is currently not used, but goes into mono-/co-incineration and largely ends up in landfills. To ensure that this phosphorus stream is not lost for agricultural use, recycling processes are necessary that provide the nutrient phosphorus for use as fertilizer and deplete the critical pollutants contained in the sewage sludge. The German Phosphorus Platform DPP e.V. is committed to a comprehensive and as timely technical implementation of the phosphorus recovery obligation introduced with the amendment to the Sewage Sludge Ordinance (2017) as well as the establishment of the recycling of the phosphorus resource. The DPP brings together a network of industry, public and private organizations as well as research and development institutions. It pursues the common goal of establishing sustainable and environmentally friendly phosphorus management in Germany with the help of efficient phosphorus use and effective recycling. With its interdisciplinary approach and know-how, the DPP is also available at the European level to develop joint strategies to strengthen nutrient cycles and at the same time reduce pollutant loads. An important, targeted component is stimulating the markets for recovered or recycled nutrients in order to maintain/increase the sustainability of agriculture.

Feedback reference
F3250264
Submitted on
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User type
Environmental organisation
Organisation
Eau et Rivières de Bretagne
Organisation size
Large (250 or more)
Country of origin
France
Initiative
Nutrients – action plan for better management

Excerpts from the attachment: Like the PSN for the CAP, European regulations should impose on Member States a national variation of the “Farm to Fork” strategy, to establish a global national strategy for agriculture and food. To force Member States to respect the European principles of precaution, prevention, correction of pollution and the polluter pays principle, the European Commission should control national regulations more firmly, prevent any environmental regression, require the taking into account of opinion of the environmental authority. A global action plan to reduce water, air and soil pollution by nutrients could be integrated into large river basin projects (SDAGE in France), with an associated financing plan. Action is now essential in terms of nutrient intake to be able to remove the territories from classification as zones vulnerable to nitrates of agricultural origin. In other words, work on the distribution of livestock on a European, national and regional scale is now urgently needed (see the Netherlands). The work is considerable because it affects all the economic sectors linked to these farms. But without support, European farmers will suffer this inevitable decline. A reform of the rules of the policy of Facilities classified for the environment and more particularly of the largest so-called IED farms is necessary: taking into account animal welfare, integration of cattle farms (which find themselves increasingly confined with the development of methanization), revision of ammonia emission thresholds in the air... Vigilance must be provided by the Commission on the application of the regulations: the smallest farms involved in certifications recognized as non-polluting (Organic Farming, high MAEC level) must be subject to appropriate regulations. On nitrogen: → ask Member States to regulate the use of mineral nitrogen fertilizers → ban urea which pollutes the most → need to help with a better distribution of animal herds and the development of mixed farming (amplification of the budgets of the 2nd pillar of the CAP on MAECs). → impose devices for monitoring ammonia in the air wherever livestock farming is important. → any new technology likely to have an impact on the environment must be scientifically and legally regulated (e.g. methanization). On phosphorus: → need to develop landscape infrastructure and meadows → limit surpluses on farms through mixed farming-livestock farming For a combined fight against nitrogen and phosphorus pollution, the protection and increased implementation of landscape infrastructure (hedges, embankments, wetlands, heads of watersheds) is decisive, currently insufficiently supported by the CAP. We would like to bring the attention of the European Commission to potassium surpluses. Slurry treatment devices on the largest farms make it possible to reduce nitrogen and phosphorus levels in effluents, but lead to potassium surpluses, which are not properly studied or regulated to date. For living territories and a preserved environment, Europe must develop small, balanced and coherent farms both from the point of view of fertilization, as well as from the point of view of the food autonomy of their breeding and their impact on landscape elements. essential for preserving biodiversity... which will be able to resist climatic hazards and ensure soil fertility. This integrated approach will also involve a review of the objectives and orientations of European agricultural and food policy.

royalty contributors

while agriculture is a
applied in France since the
CONTRIBUTION to the initiative of the European Commission
The regional association Eau et Rivières de Bretagne, created in 1969 and member of France
It participates in discussions on draft national regulatory texts and
resource
testify in France to the ICPE classified breeding authorizations – classified installations
of
The polluter pays principle
value, the
The principles of precaution, prevention and correction at the source of attacks on
of
major contributor to pollution.
in the general interest the protection and
development of aquatic ecosystems, in
".
Authorization or example of methane digesters whose impact on soil life is still to be determined
in
Nature Environnement, is approved by the French State for the protection of
(zone vulnerable to nitrates of agricultural origin, or even in action zones
collected by water agencies,
Nutrients - action plan for better management
the
Agency for 2020.
regional on the subject in particular of nitrates.
for the environment - delivered without guarantees on environmental impacts:
households are the main
water Loire Brittany
environment are in fact difficult to apply by the Member States. In
management restoration of the andan
ecologically sustainable society perspective of
is not correctly
1/ Regulatory gaps
And
the study…
Below is an illustration
example of the application of the Registration regime in vulnerable territories
reinforced like green algae berries) without switching to the diet of
the environment, to ensure “
water
Machine Translated by Google
or nutrient losses is in place, through the principle of balanced fertilization, the
Nitrates from 1991. However, pollution continues and we are reaching the end of the devices
on nutrient intake.
Concerning the nitrate reduction policy, in application of the Nitrates Directive
ÿ Like the PSNs for the CAP, European regulations should impose on
controversial, and multiple exemptions. A simple but effective regulation,
establish a comprehensive national strategy for agriculture and food.
nutrients, could be integrated into large river basin projects (SDAGE
between the contribution and need of cultures, situations or cultures at risk...
ensuring
Nitrates national action plan n°6. Note that this revision is currently blocked by the
opinions from the environmental authority.
controls), or by the farmer: excess fertilization “outlawed”, bad
regulations on the subject of leaks. Some settings cannot be

In addition, regulations remain very sectoral. For example, France knowingly
the European Commission should control regulations more firmly
avoid any deterioration of soil fertility
ÿ To force member states to respect the European principles of
accompanied by very clear and supported objectives are essential for the support of the world
The objective “
spreading schedule, limitation of organic nitrogen… in application of the directive
of 1991, French regulations are complex, with numerous indicators and
Member States a national version of the “Farm to Fork” strategy, to
in France), with an associated financing plan.
Indeed, in Brittany and on nitrogen in particular, regulations to limit leaks
estimation of the dose to be provided (e.g. overestimation of expected yields), shift
ÿ A global action plan to reduce water, air and soil pollution by
agricultural profession. The regional version of this text is thus status quo.
in
national, prevent any environmental regression, require the consideration
decided not to address the air issue when revising its Program
» will only happen through effective action
completely controlled by the administration (due to lack of resources for monitoring and
2/ The limits of the systems in place
reduce nutrient losses by at least %, all 50
agricultural and the understanding of all citizens.
precaution, prevention, correction of pollution and the polluter pays principle,
Machine Translated by Google
ÿ A reform of the rules of the policy of Facilities classified for the environment and more particularly of the largest so-called IED farms is necessary : taking into account animal welfare, integration of cattle farms (which are increasingly found locked in with the development of methanization), revision of ammonia emission thresholds in the air...
It is urgent to limit nutrient inputs to farms.
On nitrogen:
Vigilance must be provided by the Commission on the application of the regulations: the smallest farms involved in certifications recognized as non-polluting (Organic Farming, high MAEC level) must be subject to appropriate regulations.
In France, no limitation is provided for mineral nitrogen in vulnerable areas. ÿ ask Member States to regulate the use of mineral nitrogen fertilizers ÿ ban urea,
which pollutes the most The
concentration of animal production above ground induces a territorial overload (example of Brittany). ÿ need to
help with a better distribution of livestock and the development of mixed farming (amplification of the budgets of the 2nd pillar of the CAP on MAECs).
3/ Provisions on the supply of nutrients
In other words, work on the distribution of livestock on a European, national and regional scale is now urgently needed. The work is considerable because it affects all the economic sectors linked to these livestock farms.
ÿ Action is therefore essential today in terms of nutrient intake to be able to remove the territories from classification as zones vulnerable to nitrates of agricultural origin.
Ammonia in the air poses a significant environmental problem and an extremely serious public health problem. In Brittany, only one ammonia measuring station is operational to date.
Note that the Netherlands has initiated this reflection on the decline in livestock numbers. If it is not supported, this inevitable decline will be suffered by all European farmers who will not be able to resist the technological rise that is too costly, or the low-end competition from countries outside Europe, or to the impacts of climate change on polluting and poorly resilient systems.
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For a combined fight against nitrogen and phosphorus pollution, the protection and increased implementation of landscape infrastructure (hedges, embankments, wetlands, heads of watersheds) is decisive, currently insufficiently supported by the CAP.
Devices or technological developments (air treatment, slurry treatment, precision fertilization, etc.) are only accessible to the largest farms, which will experience recovery difficulties, and reduce the need for labor.
If we want living territories and a preserved environment, it is not the technological solution that should be favored, but the development of small farms that are balanced and coherent both from the point of view of fertilization and from the point of view of food autonomy of their breeding and their impact on the landscape elements essential to the preservation of biodiversity... which will be able to resist climatic hazards.
We also wish to bring the attention of the European Commission to potassium surpluses. The slurry treatment devices on the largest farms make it possible to export solid materials rich in phosphorus, to significantly reduce the nitrogen levels in the effluents (by transforming the air into dinitrogen), but lead to a concentration of potassium . On some very emblematic files, the French administration sets limits in K2O, at the discretion of the services and the Prefects, but this is absolutely not systematic, harmonized or formalized. In addition, scientific studies on the environmental impact are sorely lacking.
4/ An integrated approach to combating nutrient pollution
Anaerobic digestion has developed in France and elsewhere without studies on the impact of digestates on soil life having been completed. In Brittany, nitrogen inputs from methanization digestates are currently not taken into account for certain regulatory measures for applying the nitrate directive (derogation by exclusion of the calculation of total nitrogen on the farm for the threshold processing obligation). ÿ any new technology likely to have an impact on the environment must be scientifically and legally regulated.
ÿ impose devices for monitoring ammonia in the air wherever livestock farming is important.
On phosphorus:
The problem of phosphate pollution is mainly linked to soil erosion. ÿ need to develop landscape infrastructure and meadows ÿ limit surpluses
on farms through mixed farming-livestock farming
Machine Translated by Google
phosphorus, find the balance between livestock and crops.
To ensure soil fertility, we must get closer to the natural cycle of nitrogen and notably)...
*the increase in concentrate supplies reducing the autonomy of breeding and
The agriculture that is developing today is precisely an emitter of pollutants in disrupting the nitrogen and phosphorus cycles (import of legumes
*Nitrates
action program report :
phenomenon of parking plots and reduces the time spent on pasture, *the development of the treatment or export of nutrients, amplifying
CGAER-CGEDD of November 2020
:
of the
imbalances in the nitrogen and phosphorus cycles
https://www.cgedd.developpement-durable.gouv.fr/IMG/pdf/211118_7e_pan_delibere_cle7be4fd.pdf

*difficulties in managing the bocage and wetlands (less labor
References :
action program
contribution to the evaluation
for maintenance in particular),

*the development of robotization or even methanization which amplifies the
National Nitrates
This integrated approach will also involve a review of the objectives and orientations
water, air and impoverishes the soil, through the increase in the size of livestock farms which
of the Environmental Authority ofhttps://cgedd.documentation.developpement-durable.gouv.fr/notice?id=Affaires- 0011927&reqId=b72ee3ae-bdd8-4ab7-821c-4be1c6804ae6&pos=19 *NoticeNovember 2021 on the18th
leads in particular to:
of European agricultural and food policy.
Machine Translated by Google

Feedback reference
F3250156
Submitted on
26 April 2022
Submitted by
Franz Laner
User type
EU citizen
Country of origin
Austria
Initiative
Nutrients – action plan for better management

Nutrients – action plan for better management Please support diverse organic farming according to Demeter guidelines. If you reduce monocultures, you reduce the use of valuable agricultural land for energy production to zero! In many nations, we have somewhat lost sight of genetic engineering and its irreversible consequences due to fueled fears and stress driven by individual interests surrounding the pandemic and its vaccination regulations. Universal and inalienable human rights are based on natural rights and have been put at risk by this technology. For economic and “ecological” interests, inviolable human rights are being ignored by the egoism of individuals, possibly in good faith. We, European society, are required not to reduce the production and production of food to nutrients. We need a regulation to ensure small-scale and diverse food production in a particularly ecological way. We mustn't rely on being fobbed off by a few big players. We must ensure fragmentation and diversity, as well as local autonomy. Food and beverages and their production may not be blocked or limited by any patents. This is also about natural rights, fundamental rights, inviolable rights for all European citizens. Every form of seeds, breeding and propagation must remain open at all times and be accessible to everyone and at all times through no rules whatsoever. Individual corporations that derive business here through seeds, genetic manipulation and similar thought patterns are not allowed to have any say or rights in the European market. Speculation and investment in this fundamental area of humanity must be prevented. Local funds for food, i.e. funds for the basics of life that should not be digitized, serve as the basis for maintaining the local small structure. For an economic gaming and steering society, the digital currency that the EU is aiming for can also be put into circulation for all of life's less essential consumption activities. Kind regards FL

Feedback reference
F3250159
Submitted on
26 April 2022
Submitted by
Dominique DEJONCKHEERE
User type
Business association
Organisation
Copa and Cogeca
Organisation size
Small (10 to 49 employees)
Transparency register number
Copa 44856881231-49 and Cogeca 09586631237-74
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

Copa and Cogeca are the united voice of farmers and agri-cooperatives in the EU. Together, they ensure that EU agriculture is sustainable, innovative and competitive, guaranteeing food security to half a billion people throughout Europe. Copa represents over 22 million farmers and their family members whilst Cogeca represents the interests of 22 000 agricultural cooperatives. Like humans need food, plants need nutrients to grow and live. Given that insufficient fertilisation means a loss of yield for the harvest, applying fertilisers is a prerequisite to producing high-quality milling wheat, malting barley, horticultural produce and grass growth in sustainable livestock system. Farmers need to apply organic and mineral fertilisers to replace the nutrients taken off by harvesting crops and to maintain fertile soils in the long term. Since crop yields are not really predictable before crops are harvested, there may be agricultural land with either over or under fertilisation. Our aim is to fertilise crops and grassland as accurately as possible whilst providing environmental and economic benefits. We are specifically looking to increase the efficiency of fertilisation paying attention to soil physical growth factors (i.e. water infiltration and aeration) that make the basis for nutrient use efficiency and the use of more precise fertilisation application, such as precision farming, widespread use of decision support tools, use of more efficient fertilisers such as urea plus nitrification and urease inhibitors, fractioning of inputs, use of modern and well-adjusted spreaders, modern sprayers with individual nozzle shutoff which have also made fertiliser application extremely accurate and burying of organic inputs, etc. In this regard, the “one-fits-all” approach that sets a specific quantified European reduction target percentages for fertiliser use and losses is not appropriate indicator. This is mainly due to the varying production types and significant differences in farming practices between Member States (i.e. fertiliser use per hectare and the different fertiliser use efficiency). This would be discriminatory for farmers and could have a negative impact on production and/ or harvest quality. If the fertiliser targets proposed by the EGD were to be implemented, the figures for export substitution of wheat/maize and import of oilseed rape should be highlighted. The Commission must be asked directly, in view of the war in Ukraine where does it envisage the net import requirements to be sourced from? The EU net export of wine and olives are also expected to decline. The Commission should focus on how to promote precision and efficient fertilisation. The Commission should recognized those MS that have already made great efforts and reduced their use of nitrogen and phosphorus, ensure equal conditions of

competition and clear minimum criteria in relation to administration and control and facilitate exchanges of good practices. For details See Encl. FER(22)2187(rev.2)EN final

FER(22)2187:2 Brussels, 26th April 2022
COPA AND COGECA FEEDBACK
PUBLIC CONSULTATION ON THE ROADMAP ON NUTRIENT MANAGEMENT ACTION PLAN1

Like humans need food, plants need nutrients to grow and live. Given that insufficient fertilisation means a loss of yield for the harvest, applying fertilisers is a prerequisite to producing high-quality milling wheat, malting barley, horticultural produce and grass growth in sustainable livestock system. Farmers need to apply organic and mineral fertilisers to replace the nutrients taken off by harvesting crops and to maintain fertile soils in the long term. Compared to mineral fertilisers, the release of nutrients from organic fertilisers is less predictable. In addition, nature is dynamic meaning that nutrient cycles depend on soil biota and weather conditions that human activities can never totally controlled. Thus, natural release of nutrients from the soil can never be under the control of farmers and nutrient balance can never be set at level zero.

There are other factors that influence nutrient balance, such as the types of soil, crops, livestock, agricultural management practices, and pH levels, to name a few. Nutrient balance should be established at regional, national or supranational levels. The methodology of nutrient balance depends on numerous assumptions and data. Nutrient balance must be incentive-based for all farmers and avoid penalizing the most advanced farmers when it comes to compare actual values with historical data on individual farm.

Since crop yields are not really predictable before crops are harvested, there may be agricultural land with either over or under fertilisation. Our aim is to fertilise crops and grassland as accurately as possible whilst providing environmental and economic benefits. We are specifically looking to increase the efficiency of fertilisation paying attention to soil physical growth factors (i.e. water infiltration and aeration) that make the basis for nutrient use efficiency and the use of more precise fertilisation application, such as precision farming, widespread use of decision support tools, use of more efficient fertilisers such as urea plus nitrification and urease inhibitors, fractioning of inputs, use of modern and well-adjusted spreaders, burying of organic inputs, etc. In this regard, the “one-fits-all” approach that sets a specific quantified European reduction target percentages for fertiliser use and losses is not appropriate indicator. This is mainly due to the varying production types and significant differences in farming practices between Member States (i.e. fertiliser use per hectare and the different fertiliser use efficiency). This would be discriminatory for farmers and could have a negative impact on production and/ or harvest quality. If the fertiliser targets proposed by the EGD were to be implemented, the figures for export substitution of wheat/maize and import of oilseed rape should be highlighted. The Commission must be asked directly, in view of the war in Ukraine where does it envisage the net import requirements to be sourced from? The EU net export of wine and olives are also expected to decline.

The Commission should focus on how to promote precision and efficient fertilisation. The use of advisory services or programmes which target the increase of nutrient use efficiency on individual farms could be a good tool to achieve both environmental and economic benefits. Such services or programmes should encourage using digital application, including soil data analysis, recommended doses, legal requirements on nutrients, optimal pH for nutrient uptake, the use of liquid fertiliser and modern sprayers with individual nozzle shutoff which have also made fertiliser application extremely accurate, etc., as well as agricultural management practices that increase nutrient use efficiency. In addition, we stress the importance of using innovative practices such as nitrogen recovery from manure to mitigate this pollution and minimise nutrient leakage into the environment and enhancing the circular economy principle on farm.

1 https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12899-Nutrients-action-plan-for-
better-management_en

The Commission should recognized those MS that have already made great efforts and reduced their

use of nitrogen and phosphorus, ensure equal conditions of competition and clear minimum criteria in relation to administration and control and facilitate exchanges of good practices.
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Submitted by
Sophie Schürenberg
User type
Business association
Organisation
DVGW German Technical and Scientific Association for Gas and Water
Organisation size
Medium (50 to 249 employees)
Transparency register number
049954229126-63
Country of origin
Germany
Initiative
Nutrients – action plan for better management

Nutrients – action plan for better management Call for evidence – DVGW reaction DVGW is the German Technical and Scientific Association for Gas and Water. We are very much involved in the protection of drinking water resources and welcome the holistic nutrient management approach proposed by the European Commission in order to address the emissions of nitrogen losses which we are facing as a very severe threat over the last 30 years. Drinking water resources are tremendously impacted by the loss of nutrients mainly coming from agricultural practices polluting drinking water resources as reminded in the Nitrates Directive report mentioned in the outline of the call for evidence. We can regret that no consideration to revise neither the Nitrates Directive, stemming from 1991 nor to prepare ambitious CAP strategic plans by the Member States are under way. In 2016 we asked our drinking water operators to share their data of nitrate concentrations in drinking water catchment areas with us and set up a groundwater database for Germany. The results show that there is an urgent need for action: The nitrate limit of 50 mg/l is exceeded at around 22 % of the upstream measuring points. At around 28 % of the monitoring sites, nitrate concentrations are above 37.5 mg/l. At the peak in 2016 even nitrate values of up to 357 mg/l were reached at monitoring sites in drinking water catchment areas. Studies such as the DVGW research project "Declining nitrate degradation capacity" from 2013 show that the natural degradation capacity of nitrate in soils is not (any longer) available in some regions or has already been significantly depleted. If the nitrate can no longer be degraded by natural processes, this will result in a further significant increase in the nitrate level in the groundwater and the risk will increase that these high nitrate concentrations will then break through directly to the drinking water aquifers and wells. Having this in mind DVGW encourages the Commission to take urgently and ambitiously action to solve the “nitrate”-problem of water bodies we are facing for such a long time in a way drinking water operators/consumers don’t bear any longer the costs for cleaning up agricultural pollution via costly end-of pipe treatment.

 Introduction For reasons of precautionary protection The guiding principle is based on human health for the nature of the food drinking water and its resources for

many years tenth on the following principles: • Resources should be as unpolluted as possible th deposits are used; therefore are to protect them as best as possible. • Drinking water resources should be procured as such be that drinking water can be produced without treatment can be obtained. Is not this possible, the resources should be obtained this way be that the raw water only contains natural close, simple processing processes Drinking water can be treated. • Measures to protect drinking water resources have priority over processing treatment of the water obtained. At many water suppliers in Germany represent increasing or high nitrate concentrations ons in drinking water resources are increasing seems to be a glaring problem. Groundwater is found at wells or springs promoted and made into drinking water in the waterworks processed. The water company is investigating groundwater used for drinking water supply water and drinking water regularly for nitrates. Natural groundwater with nitrate values th of < 10 milligrams per liter (mg/l) as The basis for long-term, secure drinking water supply is becoming increasingly rare found. Instead, they are extensive and complex measures required the legally prescribed limit for drinking water of 50 mg/l can. These include, among other things: the mixture from more heavily polluted to less polluted Groundwater, the new construction and conversion of buildings extraction plants, the use of which is technically complex processing processes up to and including Closure of wells or spring catchments. In addition, water suppliers directly impact te agreements with farmers in the catchment areas and finance water contracts traditional management methods. This will in some federal states in the cooperation nen between the water industry and the Organized agriculture. The additional Efforts and costs of all these measures ultimately have to be informed by the consumer Drinking water fees are financed. Out of From a consumer protection point of view, it is therefore un- so that the preventative health safety protection will also be taken into account in the future and the additional costs incurred must be fairly attributed to the person responsible A significant portion of nitrate comes from nitrogen fertilization in agriculture (Fig. 1). The nitrogen that does not come from plants can be recorded, achieves this Groundwater and is included in the groundwater measurement can be detected as nitrate. In the ground and In groundwater, nitrate can occur under certain conditions conditions are dismantled. With the one set up since November 2016 Groundwater database nitrate (GWDB nitrate) the industry associations BDEW, DVGW and VKU is specifically the nitrate pollution of the Drinking water resources in the catchment areas of drinking water production plants federally widely recorded and evaluated. Database In this respect, it is similar to an “incoming goods inspection” le” of the waterworks. Groundwater measuring points in the inflow to the drinking water wells – also referred to as apron measuring points - in the catchment areas of Brun- nen set up and continuously sampled. As of April 2018, there are 1,123 operators nationwide Data on nitrate contamination of your apron measurement provide (VMST) and wells (RWEST) provided. A total of 10,650 sample sampling points (raw water extraction and procedures) field measuring points) with 178,000 nitrate analyses recorded. The GWDB contains nitrate analysis results recorded by water suppliers whose drinking water Serving quantity more than 38% of German water supply. Drinking water resources are stressed The first evaluations of the apron measuring len show that the threshold value of the basic water regulation of 50 mg/l to 21.5% of the measuring points is exceeded (Table 1). In the Values of up to 357 will peak in 2016 mg/l for nitrate reached. If you also look at this in this context Preliminary measuring points with nitrate levels above 37.5 mg/l are contaminated, i.e. H. which already one urgent trend reversal in line with the goals the Water Framework Directive is required This is the case in 28% of the apron measuring points. very heavily contaminated > 50 mg/l heavily contaminated > 37.5 – 50 mg/l slightly to moderately contaminated > 10 – 37.5 mg/l largely uncontaminated ≤ 10 mg/l 472 21.6% 148 6.8% 504 23.0% 1,063 48.6% Apron measuring points 2,187 100.0% Nitrate classes In total At the raw water extraction points, the use is load at height did not reach everywhere men. The proportion of raw water extraction points len where the nitrate concentration exceeds 37.5 mg/l is 9%. This can be have various causes (e.g. extraordinarily commissioning of contaminated wells, long stays retention times in the aquifer, more natural nitrate degradation). Case studies This development puts affected water supplies utility companies face special challenges requirements. In the following case studies the nitrate concentrations of apron measuring points or raw water extraction points contaminated drinking water resources. In the case study of North Rhine-Westphalia (Fig. 2) the nitrate concentration was in the surface Nearby groundwater was already well above 2003 Case study North Rhine-Westphalia the threshold value of the groundwater regulations voltage (50 mg/l) and rose in the following over the years, despite many years of cooperation, ter up to 260 mg/l. The

cooperation land- economy/water management consists in the environment field of the measuring point since 1993. The The region is used intensively for agriculture. There are two main effects to this a constant increase in nitrate levels. The Promoting biogas production has the cultivation of corn for biogas use of 35% since the year 2003 to more than 50% by the year Let it grow in 2013, with accompanying intensive fertilization. In addition, the funding cooperation measure “Area Quiet Areas” gung” discontinued in 2008, what after numerous permanent grassland breaks with triggered significant nitrogen surges. In the immediate inflow area of the measuring The position was partly permanently green at the end of 2011. land turned into arable land. Since the year In 2011, within the agricultural cooperation ensures compliance with a specific binding nitrogen value in the soil according to the Harvest in autumn (Nmin) at the maximum 45 kg N/ha introduced as a support measure. In 2014 the target value was increased again to maximum times decreased by 40 kg N/ha, which is stagnation of the nitrate increase to a slight one resulted in a decline. The nitrate concentration in the Nie- der Saxony (Fig. 3) was still a long way until 2010 below the threshold. Afterwards are the values rose sharply to 286 mg/l. Cultivation takes place predominantly in the influx of corn and potatoes instead of that too Cultivation of grain and grassland. The area chen are mainly made with organic But also fertilizers from livestock farming Fertilized with digestate from biogas production. In addition, organic fertilization is carried out supplemented with mineral fertilization. The Groundwater measuring point records the surface groundwater close to the area. The case study of Bavaria (Fig. 4) lies in one traditional agricultural area with the predominant crops grain, sugar beet and Field vegetables. Especially growing vegetables is considered a “problem culture” with regard to Nitrate content in groundwater. The The area was already considered before the 1990s Nitrate remediation area designated. The drinking water supply has since increased to around 40% Deep water without anthropogenic pollution converted to supply drinking water without exceeding the nitrate limit value to ensure. In the water protection area, cooperation agreements with agriculture Reduction of nitrate discharge into the Groundwater completed. The agreement Fig. 3: Apron measuring point with increasing, extremely high nitrate content Fig. 4: Apron measuring point with nitrate content above the limit despite measures 4 Case study Lower Saxony Agricultural Use Corn; Potatoes; grassland; Grain Notes Intensive agriculture on predominantly sandy soils Nitrate concentration (mg/l) 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 Threshold value of the GrwV 75% of the GrwV threshold 300 250 200 150 100 50 20172003 0 Bavaria case study Agricultural Use Cereals; Sugar beets and field vegetables (irrigation) Notes Groundwater from deep floors may not be used Nitrate concentration (mg/l) 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 Threshold value of the GrwV 75% of the GrwV threshold 300 250 200 150 100 50 2003 0 2017

genes promote cover crop cultivation and a breakover date as late as possible. The measures made it possible to reduce the nitrate stop in the fountain from originally around 70 mg/l can be reduced to approx. 50 mg/l. Above all Through the cultivation of field vegetables, a further further reduction of the nitrate content only a longer period of time possible. The water law permit for withdrawal of deep water will not happen in the near future more extended. The cost-effective local one Supply of drinking water is therefore dangerous det. There is a risk of noticeable cost increases through the then necessary construction of storage facilities riding facilities or avoiding approaching their resources. In the case study from Baden-Württemberg (Fig. 5) the nitrate concentration was already in the year Above the threshold in 2004 and has been rising since continuously in 2006. The catchment area is used intensively for agriculture, especially especially through energy corn for biogas Investments. In Baden-Württemberg the protected area and Compensation Ordinance (SchALVO) since The goal for the past 30 years has been the raw water the public water supply from being affected Damage caused by substance inputs from the Protect land management. For this will agricultural management in Restricted water protection areas. For there- resulting economic disadvantages the farmers receive from the state house just financial compensation. Despite the requirements regulated under state law gen, which are also in this water protection area must be implemented and the necessary brought compensation payments to the rural So far, no one has been able to do business here Trend reversal in nitrate concentrations can be achieved Natural nitrate degradation trivializes this Burden The Federal Ministry of Agriculture points out in its monthly report that the balanced nitrogen surpluses in agriculture commercially used areas in German country is still at a high level stagnate. A key reason

why Despite these surpluses, the nitrate concentrates tions of groundwater from agricultural commercially used catchment areas in some regions gions are not much higher, are natural Mining processes in the course of the subsoil legend. The further connections have the DVGW in its research project “After- nitrate degrading capacity” was examined. Nitrate can occur naturally in the soil or Pyrite (mineral) present in the aquifer with the main components sulfur and egg sen) or organically bound carbon be dismantled. However, Py- rite and carbon used up. Therefore natural nitrate degradation finally. If Ni- no longer occurred through natural processes can be built, this has another significant increase in nitrate content in the base water (Fig. 1). There are clues on the fact that this mining capacity in some regions is already decreasing significantly. It threatens the risk of immense nitrate loads arrive at the drinking water fountain. That before The existing mining resources are downplayed in this respect the stressful situation. Conclusion With the new groundwater database nitrate The industry associations BDEW and DVGW record this and VKU nationwide the nitrate pollution of the Groundwater in the catchment areas of the Drinking water production plants. The evaluators Evidence shows that there is an urgent need for action may exist: Around 22% of the apron measurement The nitrate limit of 50 mg/l will be set exceeded. At around 28% of the apron measurement the nitrate concentrations are higher 37.5 mg/l. The peak was in 2016 Nitrate levels even reached up to 357 mg/l. Studies like the DVGW research project “Decreasing nitrate degrading ability”. the year 2013 show that the natural decline building assets in some regions not (more) present or already clearly visible is needed. If the nitrate comes from natural sources processes can no longer be dismantled, This has a further significant increase in the Nitrate content in groundwater results and The risk increases that these high nitrate levels Further information Would you like to find out more? Then please contact us our contact persons from the participating associations: Contact persons are: DVGW German Association of Gas and Water compartment e. v. Dr. Claudia Castell Exner Josef-Wirmer-Str. 1-3 53123 Bonn Tel.: +49 (0) 228 9188-650 Email: castell-exner@dvgw.de Internet: www.dvgw.de BDEW Federal Association of Energy and water management Andrea Danowski Reinhardtstr. 32 10117 Berlin Tel.: +49 (0) 30 300199-1210 Email: andrea.danowski@bdew.de Internet: www.bdew.de VKU Association of Municipal Companies e. v. Nadine Steinbach Invalidenstr. 91 10115 Berlin Tel.: +49 (0) 30 58580-153 Email: steinbach@vku.de Internet: www.vku.de/wasser then stop straight up to the drinking water break through energy production facilities. Monitoring drinking water resources forms nitrate via the groundwater database a benchmark for the extent to which the new fertilizer fairly positive on the nitrate levels in the drinking water resources. Measured against the precautionary consumer protection and the guiding principles for procurement ness of the food drinking water and its resources, it is imperative that water-friendly agriculture Germany becomes a reality. The drinking water Server resources must be protected in such a way that everywhere the drinking water limit of 50 mg/l is safe is adhered to.

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Academic/research Institution
Organisation
programme OCAPI / LEESU / Ecole des Ponts ParisTech
Organisation size
Large (250 or more)
Country of origin
France
Initiative
Nutrients – action plan for better management

An essential lever to prevent leakage of nutrients from wastewater into natural environments (air, soil and water) lies in the agricultural reuse of nutrients contained in human excreta. Source separation of domestic wastewater constitutes a promising avenue for this. This must be supported at European level to encourage 1. public research, R&D, public information on the subject, 2. its integration into local public policies, 3. the implementation of territorialized and relocated sectors sanitation allowing the return of nutrients to the ground with a view to sobriety and circularity. Source separation is based on the principle of separation of flows (urine, feces, gray water) from the production of the effluent, collection and transport, to the treatment and use of the resources they contain. Similar concepts have been formulated, such as ecological sanitation (ECOSAN). This approach constitutes a key element in the transition of food/excretion systems towards an approach combining sobriety, circularity and the fight against environmental pollution (a). The synthesis of industrial nitrogen fertilizers requires large quantities of energy, provided by fossil hydrocarbons that emit greenhouse gases. Concentrated phosphorus resources are limited and increasingly less accessible. This leads to fertilizer shortages and increased prices. However, domestic wastewater contains significant quantities of nutrients useful to plants (nitrogen, phosphorus, potassium, etc.), because almost all of the nutrients we ingest are ultimately found in our excretions, particularly in urine. In the majority of European territory, the elimination of phosphorus and nitrogen from wastewater requires significant energy expenditure and expensive processes. Separation at source can make it possible to move away from a logic of elimination and produce fertilizers. The effectiveness of fertilizers resulting from source separation has been the subject of numerous evaluations showing their strong potential. Without a change in agricultural practices, around 20% of the mineral fertilizers currently used in France could be replaced by products resulting from separation at source. Considering a change in diets and a development of agroecological practices, separation at source can make it possible to completely dispense with nitrogen and phosphorus mineral fertilizers (b, c). Given the strategic challenge for Europe of valorizing the nitrogen and phosphorus resources contained in our excretions, it seems relevant that the European directives, and in particular the urban waste water directive, do not only require the elimination of nitrogen and phosphorus from wastewater but also the recovery rates of these nutrients. Human urine can be used as fertilizer with storage processing. Many other treatments can be carried out to stabilize the nitrogen in a form that limits losses by volatilization during spreading or during a volume reduction treatment. It is possible to produce concentrated fertilizers with a nitrogen content close to that of mineral fertilizers (up to 24% if the urine is dehydrated), or even more in the case of extractive treatment. The choice of urine treatment methods must be adapted according to territorial configurations (d). Life cycle analyzes carried out on source separation sectors show a real gain in the impact of the management of human excreta on the environment when (1) nitrogen is separated from wastewater and no longer treated with biologically by nitrification/denitrification, (2) nitrogen is used in agriculture to replace conventional mineral fertilizers (f, g, h)

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[En ligne].

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Submitted by
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User type
Non-governmental organisation (NGO)
Organisation
IFOAM Organics Europe
Organisation size
Small (10 to 49 employees)
Transparency register number
67128251296-84
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Belgium
Initiative
Nutrients – action plan for better management

IFOAM Organics Europe welcomes the Commission's initiative to develop an EU action plan for a better management of nutrients. This should provide the holistic approach needed to achieve the 2030 target set in the Farm to Fork and Biodiversity strategies to reduce nutrient losses by at least 50%, while ensuring that there is no deterioration in soil fertility. Through its approach to plant nutrition, organic farming can significantly contribute to the reduction of nutrient pollution. Therefore, the future INMAP should recognise the contribution of organic farming to sustainable nutrient management and propose measures to support the development of organic farming in this respect. As the Commission highlights in its "Call for evidence", the agricultural sector contributes significantly to nutrient pollution of soil, water and air, mainly through fertilisation practices, including the use of synthetic mineral fertilisers. Since synthetic fertilisers are prohibited in organic farming, their negative impacts on the environment are avoided. Furthermore, in organic farming, plants should preferably be fed through the soil ecosystem, therefore organic farmers focus on maintaining and enhancing soil fertility by closing nutrient cycles where possible. The organic approach to plant nutrition is based on ecological processes and recycling, allowing to minimise dependence on external inputs. Organic farmers rely mainly on biological nitrogen fixation by legumes, crop residue management, and the application of animal manure and composts. In addition, few fertilisers and soil improvers are allowed in organic farming, provided they are based on natural substances or low solubility mineral fertilisers. All these practices contribute to reducing the effects of excess nutrient use on soil and aquatic ecosystems as well as on air quality. In addition, by creating an efficient nutrient circulation within the farm, organic farmers are less dependent on external fertilisers. They are thus less affected by the volatility of the synthetic fertiliser market, which is particularly important to note in the context of the war in Ukraine. In summary, nutrient management according to the organic principles make the farms not only environmentally resilient, but also economically. In the EU Action Plan for the development of organic production, the Commission committed to promote the reduction of nutrient release in all types of farming, with organic farming leading the way (Action 23). The upcoming INMAP is an opportunity to put this commitment into practice. The INMAP should make sure that sustainable nutrient management approaches, such as organic farming, receive strong support in the National Strategic Plans of the Common Agricultural Policy. Developing the use of on-farm nutrient budget tools would also

help farmers to better adapt their nutrient strategy to the needs of the farm. In parallel, the INMAP should address implementation and enforcement gaps of the current EU legislation related to nutrient cycles. Finally, as the Commission intends to stimulate the markets for recovered or recycled nutrients through the INMAP, it is important to anticipate the compatibility of recycled fertilisers to be placed on the market with organic farming rules. For example, the authorisation of recycled fertilisers in organic farming may be limited depending on the source of waste or the manufacturing process. Ensuring separate collection of waste and providing a certified production process are possible options to facilitate the adoption of recycled fertilisers in the organic sector. Finally, putting organic farming at the heart of the INMAP will help to achieve the Farm to Fork target of 25% organic farmland by 2030.

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User type
Academic/research Institution
Organisation
projet Sociocapi / LEESU / Ecole des Ponts ParisTech
Organisation size
Large (250 or more)
Country of origin
France
Initiative
Nutrients – action plan for better management

In Europe, avoiding nutrient leaks into the environment (water, soil and air) must involve a reinvention of sanitation systems, particularly urban ones. Indeed, centralized wastewater treatment systems face recurring saturation. Added to this is a high footprint in terms of energy expenditure, greenhouse gas emissions (N20) and pollution of aquatic environments (NO3, etc.). However, these excreta, managed separately, could be used as fertilizing materials: this would make it possible to move away from a logic of depolluting excreta and create a mutualism between urban and agricultural territories, the latter then benefiting from perennial, local, non-fossil fertilizing materials. . A promising avenue for this lies in source separation of domestic wastewater, to collect and treat human excreta separately. This approach can be based on the existence of a wide diversity of models of separative toilets without flushing or with very low flushing, and dry male and female urinals, adapted to different types of context. These devices allow the separate collection of urine and feces, in an odorless and healthy manner (a). Source separation has been developing at an increasing pace since the 1990s, in the form of local initiatives and research projects: in particular in Sweden, Denmark, Germany, Austria, the Netherlands, Belgium, in France (https://egestabase.net). In terms of environmental issues, source separation proves to be particularly relevant in different types of situations: (1) sites with high stakes (rapidly growing cities (in particular metropolises), shrinking cities, island context, areas tourism and fragile natural environments, particularly mountainous and coastal areas; basins newly or probably soon classified “sensitive to eutrophication”); (2) sites where the implementation of a pilot project presents fewer obstacles (rural and peri-urban suburban housing, new construction, participatory housing); (3) sites producing large volumes of effluent (events, train stations and airports, stadiums and performance halls); (4) sites with advantages in terms of demonstration and awareness (schools, public establishments). On a cultural level, these systems constitute an opportunity for environmental awareness among European citizens regarding nutrient pollution and the impact of human activities on biogeochemical cycles. Indeed, the toilet flush and the sewer produce a material but also symbolic distance between the inhabitants and the issue of wastewater. Conversely, the practice of separation at source, in conditions of comfort and health, contributes to improving the understanding of the possible links between sanitation and fertilization of agricultural land. It is part of citizen engagement in the transition of food/excretion systems towards more circularity and sobriety (b). To enable the scaling up and transposition of these innovative practices in regional planning and in particular, in the making of the city, the agenda of actions to be carried out involves: (1) convincing, but above all supporting stakeholders in the management of urban flows and the agricultural world (from this point of view, demonstrators are required to play a key role); (2) advocate for the extension of the field of participatory urban planning, while training residents in the sustainability issues of water and excreta management; (3) support the emergence of pilot projects, their replication in conventional planning and their replication in different territorial contexts (c).

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User type
Business association
Organisation
International Methionine Analogue Association (IMAA) asbl
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Transparency register number
Inter1817542036
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

IMAA (The International Methionine Analogue Association) appreciates the initiative of the European Commission, regarding the integrated nutrient management action plan and the objective to look at the entire nitrogen (and phosphorus) cycles. As far as nitrogen cycle is concerned, the adaptation of the N excretion of livestock production systems to the local environment is a key element, especially when it is in excess. The reduction of protein content in the livestock diets, using amino acids and their analogues is a recognized solution to reduce nitrogen excretion from livestock (Best Available Technique reference document for the intensive rearing of poultry and pigs, herewith attached). This approach is applicable for all livestock production system (ruminants, rabbits, etc.). In addition, the use of amino acids in livestock diet allows the use of local sources of protein (such as rapeseed meal or sunflower meal), further improving the nitrogen cycling. Currently the protein content of pig and poultry feeds can be reduced down to 14 – 15 % Crude Protein per kg of complete feed.

Feedback reference
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Submitted by
Jessica Fitch
User type
Business association
Organisation
European Biostimulants Industry Council (EBIC)
Organisation size
Micro (1 to 9 employees)
Transparency register number
034239613511-14
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

EBIC urges the European Commission to include specific references to the use of plant biostimulants and other fertilising products which directly contribute to enhanced nutrient use efficiency; particularly in the context of the current global food and fertiliser crisis and its wide-ranging and long-term implications for food security. EBIC would like to offer this and other insights to the elaboration of the integrated nutrient management action plan (INMAP), including where and how plant biostimulants may contribute to the desired impact of such an initiative. You can find EBIC's contribution in full in the PDF attached. The European Biostimulants Industry Council (EBIC) represents European producers of plant biostimulants. EBIC's mission is to ensure biostimulant technologies are valued as integral to sustainable agriculture while securing an enabling regulatory framework for all of them.
www.biostimulants.info

European Biostimulants Industry Council

In response to the Call for Evidence: 'Nutrients – action plan for better management'

See: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12899-

Nutrients-action-plan-for-better-management_en

The European Biostimulants Industry Council (EBIC) welcomes this initiative for an action plan for

better management of nutrients, as established in the Circular Economy Action Plan. The call for

evidence correctly outlines the need for better nutrient management and reduced nutrient losses and

pollution, both of which plant biostimulants can contribute directly to.

EBIC therefore urges the European Commission to include specific references to the use of plant

biostimulants and other fertilising products which directly contribute to enhanced nutrient use

efficiency; particularly in the context of the current global food and fertiliser crisis and its wide-ranging

and long-term implications for food security. EBIC would like to offer this and other insights to the

elaboration of the integrated nutrient management action plan (INMAP), including where and how

plant biostimulants may contribute to the desired impact of such an initiative.

EBIC will continue to engage with the following steps in the consultation stage and is eager to

contribute to this process over the coming months. Please do not hesitate to contact us for more

information and details relating to plant biostimulants and nutrient management, particularly in

improving the nutrient use efficiency of plants.

EBIC calls on the European Commission to consider the following points in the elaboration

of the INMAP:

• Nutrient use efficiency (NUE) is not mentioned at all in the call for evidence, whereas innovative

plant nutrition solutions including improved NUE and products and practices which contribute

to this should be explicitly recognised, and their uptake facilitated.

o The INMAP should promote the use of a key indicator to reduce nutrient losses such as

the NUE indicator, which is broadly accepted by the scientific community.

• The INMAP should build on the vision of the European Parliament and take a holistic approach

to the 50% target reduction of nutrient losses in Europe by 2030.

o EBIC supports the 50% reduction of nutrient losses target; however, it questions

whether this should translate into a 20% reduction in fertiliser use.

o Considering the current situation in Ukraine and its implications for global food and fertiliser supply, EBIC strongly urges the Commission to encourage production of food, feed and fertilisers in the EU rather than actively advocating the reduction in capacity of EU production at a time of global food insecurity and uncertainty.

• The INMAP should incentivise sustainable nutrient management at farm and field level, including

with regards to animal production.

o Appropriate application of nutrients from manures and slurry according to the needs of soils and crop production must be fostered; over-application of manures and slurry due to the proximity of animal production to fields is a substantial contributing factor to nutrient losses in some parts of Europe today.

• The INMAP must foster balanced nutrition and improved nutrient management practices including requirements for the development of a fertilisation plan which is regularly updated throughout the year according to crop growth, weather and other factors.

o This should include the use of plant biostimulants to improve nitrogen and phosphorus efficiency; secondary micronutrient use of plants; improved tolerance to abiotic stress; and more.

• The INMAP should contribute to accelerating the uptake of circular economy practices by removing existing barriers to nutrient recycling from waste streams and other by-products.

o Some plant biostimulant products recycle nutrients from other waste streams which would otherwise be discarded and lost to the environment, improving nutrient recycling and reducing losses.

o Unfortunately, today, there are many regulatory barriers to the use of such recycled nutrients which need to be addressed first.

EBIC therefore calls for the INMAP to include concrete policy options to promote and support innovative

plant nutrition solutions such as plant biostimulants which could deliver some of the benefits listed

above to reducing nutrient losses and pollution.

The Fertilising Products Regulation 2019/1009 defines plant biostimulants by their function and benefits,

many of which are relevant for reducing nutrient losses. Manufacturers will have the opportunity, for

the first time at the European level, to claim that a fertilising product – such as a plant biostimulant –

improves nutrient use efficiency (after validation of the claim). This will be an essential tool for farmers

to contribute to EU Green Deal objectives, including those outlined in the INMAP.

However, for plant biostimulants to contribute to the objectives outlined in this call for evidence, the

right policy, and regulatory coherence, frameworks and implementation are all required, including – as

well as reaching far beyond – the implementation of the Fertilising Products Regulation 2019/1009.1

Coherence crucial across EU policies

There must be coherence between all relevant policy frameworks that govern agricultural production,

inputs, and land use to reduce nutrient losses across Europe. This includes the Fertilising Products

Regulation (FPR), Common Agricultural Policy (CAP), Organic Production Regulation, Farm to Fork

Strategy, Biodiversity Strategy, Circular Economy Strategy, the new EU soil strategy, the INMAP and

more. But this coherence needs to go beyond soundbites and include impact assessments of specific

measures to understand the trade-offs and make informed decisions.

Ensuring a Single Market for all relevant products should also be central to policy coherence. This is

currently not the case for organic production, where acceptance of agricultural inputs varies from one

Member State to another and from one certifying body to another. Such discrepancies across the EU

currently represent a hindrance to practical measures for nutrient management, particularly in the

context of the EU's Farm to Fork objectives for increased organic agricultural land.

Foster innovation

The Commission also needs to consider fostering innovation and ensuring that innovative products are

accessible to farmers. In this light, we would like to call attention to the particular needs for beneficial

microorganisms in agriculture for improved nutrient use efficiency. The Fertilising Products Regulation

recognises microbial plant biostimulants for the first time. However, at the moment, there is no clear

pathway for having additional microorganisms – beyond a very short list – approved for use in EU

Fertilising Products. Considering the vast potential of beneficial microorganisms and rapid developments

in this area of R&D, it would be a missed opportunity for improved nutrient use if the EU did not find a

way for companies to bring these products to market soon. Therefore, we strongly suggest the rapid

development of safe and efficient pathways to add new microorganisms to this list to unlock the full

potential of microbial plant biostimulants for nutrient management and achieve the ambitious Farm to

Fork Strategy objectives.

Training and Education needed

1 “In a loss for the Circular Economy, Fertilising Products containing animal by-products are frustrated from

entering the Single Market under the Fertilising Products Regulation (FPR)”, Joint Media Release,

https://biostimulants.eu/issue/in-a-loss-for-the-circular-economy-fertilising-products-containing-abps-are-

frustrated-from-entering-the-single-market-under-the-fpr/

The CAP should also ensure adequate training, advisory, and incentives for farmers to learn about and

adopt sustainable, site-specific practices to improve soil health, such as integrated plant nutrition and

soil fertility management, within conventional and organic farming. This is especially important in light

of recent research showing that farmers have more demanding standards for bio-based fertilising

products fertilisers than for mineral fertilisers, yet are not willing to pay as much for bio-based

fertilisers.2

About EBICThe European Biostimulants Industry Council (EBIC) represents European producers of plant

biostimulants. EBIC’s mission is to ensure biostimulant technologies are valued as integral to sustainable

agriculture while securing an enabling regulatory framework for all of them.

2 Juan Tur-Cardona et al., “Farmers’ Reasons to Accept Bio-Based Fertilizers: A Choice Experiment in Seven

Different European Countries,” Journal of Cleaner Production 197 (October 1, 2018): 406–16,

https://doi.org/10.1016/j.jclepro.2018.06.172.

1. Feedback reference

F3250408
Submitted on
26 April 2022
Submitted by
Tabea Knickel
User type
Non-governmental organisation (NGO)
Organisation
Deutsche Phosphor-Plattform DPP e.V.
Organisation size
Micro (1 to 9 employees)
Country of origin
Germany
Initiative
Nutrients – action plan for better management

Sustainable nutrient management in agriculture and closing material cycles make an important contribution to resource protection. Good agricultural practice with needs-oriented fertilization, taking into account soil test results, is the basis for the production of healthy food and feed. The nutrient phosphorus, which is so important for plant growth, is a limited natural resource whose occurrence is not equally distributed across the globe. The war in Ukraine and the conflict with Russia and the resulting price developments in agricultural raw material markets show that Europe has become too dependent on imports in recent years. Russia is a supplier of a significant amount of raw material imports to Europe. The import share of raw phosphates from Russia is currently around 24% (Phosphatestein 2020, data source BGR 2021). It is therefore now important to reduce Europe's dependence on imports and strengthen the resilience of supplies and food security. The availability of phosphorus as an important plant nutrient is essential for this. Therefore, all possibilities should be exhausted to recover and reuse the nutrient phosphorus from all relevant material flows. A significant phosphorus recycling potential lies in recycling, in which phosphorus from municipal sewage sludge and other organic waste (e.g. animal by-products) are increasingly recycled. However, the majority of the phosphorus contained in sewage sludge is currently not used, but goes into mono-/co-incineration and largely ends up in landfills. To ensure that this phosphorus stream is not lost for agricultural use, recycling processes are necessary that provide the nutrient phosphorus for use as fertilizer and deplete the critical pollutants contained in the sewage sludge. The German Phosphorus Platform DPP e.V. is committed to a comprehensive and as timely technical implementation of the phosphorus recovery obligation introduced with the amendment to the Sewage Sludge Ordinance (2017) as well as the establishment of the recycling of the phosphorus resource. The DPP brings together a network of industry, public and private organizations as well as research and development institutions. It pursues the common goal of establishing sustainable and environmentally friendly phosphorus management in Germany with the help of efficient phosphorus use and effective recycling. With its interdisciplinary approach and know-how, the DPP is also available at the European level to develop joint strategies to strengthen nutrient cycles and at the same time reduce pollutant loads. An important, targeted component is stimulating the markets for recovered or recycled nutrients in order to maintain/increase the sustainability of agriculture.

2. Feedback reference

F3250407
Submitted on
26 April 2022
Submitted by
Kaj Granholm
User type
EU citizen
Country of origin
Finland
Initiative
Nutrients – action plan for better management

This input to the Call for evidence is provided on behalf of the Interreg Platform project SuMaNu (balticsumanu.eu). SuMaNu supports the Commission's initiative on Integrated Nutrient Management to reduce negative environmental effects (climate change, air pollution, eutrophication and loss of habitats and biodiversity) from excess nutrients lost from agricultural activities. Agricultural nutrient management should be based on soil fertility analyses, sustainable crop rotation and utilization of fertilizers and soil improvers of organic origin, i.e. recycled from e.g. animal manure and municipal and industrial side-streams. Animal manure is an integral resource for nutrient recycling containing the largest share of the recyclable nutrients. Proper methods and calculation tools to assess nutrient content in different manures should be used to ensure efficient nutrient recycling within agriculture. Such have just been developed in a regional Interreg project MANURE STANDARDS which is part of the SuMaNu platform (www.luke.fi/manurestandards/en) and the results are usable in all EU. Further research and knowledge on bio-based fertilisers and their use is produced i.a. by the Horizon 2020 project Lex4bio (lex4bio.eu,Https://www.phosphorusplatform.eu/platform/espp-members-2/1884-lex4bio). The project has constituted that the amount of organic biomasses produced would cover 65% of the nitrogen and 130% of the phosphorus need for fertilizer use in Europe. This represents true potential to reduce fossil dependency but requires strategic measures and inclusive approach. Concerning the use of sewage sludge in agriculture, including the fertilizer use of digestate from anaerobic fermentation of sewage sludge, it is important to safeguard hygienic safety. Co-processing of sewage sludge and manure is not advisable as the risks related to trace elements, organic contaminants and hygiene are typically higher in sewage sludge than in manure. It should be also noted, that phosphorus fertilisation value of sewage sludge is depressed by Fe-salts, commonly used as phosphorus precipitation chemicals at WWTPs. Manure based phosphorus is comparable to mineral fertiliser and co-processing may depress phosphorus fertilisation value of manure. In the use of sewage sludge, the contamination as well as nutrient runoff risks should be minimized regardless of its use or disposal in any form or for any purpose. Overall, integrated nutrient management should encompass all levels, from farm level to the global level. To address regional nutrient surpluses, SuMaNu welcomes solutions to facilitate regional reallocation of nutrients from surplus to deficit areas and to advance manure processing. Although the probable future growth of farm size by LSU brings huge risks for unsustainable manure nutrient application, it also allows more options for economically feasible manure processing. Moreover, with increasing farm size manure processing can and should be made obligatory. This may help regional re-distribution of manure nutrients if the demand side follows pace.

3. Feedback reference

F3250402
Submitted on
26 April 2022
Submitted by
Thomas Zollner
User type
Business association
Organisation
FarmTech Society
Organisation size
Micro (1 to 9 employees)
Transparency register number
469686733585-87
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

FTS is an industry association representing the Controlled Environment Agriculture (CEA) sector, a fast-evolving emerging solution that potentially offers great improvement for the inclusiveness, sustainability, and competitiveness of all food systems, in line with the EU policy objectives and Green Deal goals. CEA deploys technology that is based on imitating natural processes (i.e. biomimicry) in a way that intensifies crop yield, while cutting out pests & diseases, reducing climate and supply chain risks, intensifying yield, improving nutrition & quality, and upholding ecological - and entrepreneurial principles. CEA helps to address the dilemma of outdated, unsustainable and economically unviable practices by helping growers to extensify their field practice (restoring soils and biodiversity), by integrating intensive agro-ecological CEA methods on small footprints, achieving higher yields with a fraction of the land, typically in “non agricultural” areas, such brownfields or outdated farming economy buildings spaces. Thanks to its biomimicry applications and technologies, CEA allows growers the complete steering of the growing process and managing all agriculture inputs with circular principles. As policy-makers consider the scope of the proposal and its interlinkages with other policies, FTS highlights several key points, which are crucial for the development for a multidimensional sustainability of food systems and achieve a roadmap towards a resilient and sustainable food system : 1. Circular Resource Efficiencies — CEA based food systems preserve and strengthen the circular and much needed principles for nutrition and irrigation recycling. The EU is currently the market leader in CEA technology thanks to the mature greenhouse technology from the Netherlands, Belgium and Spain, alongside a deep knowledge base, innovation clusters in seed development and general superb plant growing experience in CEA. This significant knowledge - and technology base not only needs recognition for its transformation potential, but also recognition as a solution provider to a wider agriculture production in rural communities helping to curb pollution of the waterways by excess nutrients while delivering the yields in clean and healthy nutrition and offering exciting new career opportunities to existing and emerging agriculture communities. FTS calls the EU Commission to consider the exceptional relevance of the CEA industry in shaping and bolstering the sustainability, competitiveness and resilience of

EU food systems. 2. Digitalization and Career Creation / Generational Renewal — Digitized food systems contribute not only to the EU's competitiveness in the global arena, but also increases performance with regards to resource efficiency, land and water usage, crop yield and transparency. Socially sustainable and resilient food systems rely on an attractive agriculture sector and the renewal of the workforce basis, since a third of EU farmers will need successors over the next 15 years. The digitalization of agriculture offers exciting (digital based) work perspectives for new generations and professionals from STEM backgrounds, particularly those with great interests in agri-food careers but shying away from rural isolation and strenuous labor conditions. 3. Decarbonization / Climate Adaptation — CEA systems ensure healthy food for all without exacerbating climate change and polluting ecosystems. Hybrid agri-food systems utilizing CEA integrated into field practices can be designed and implemented with circular practices and based on renewable energy and circular waste streams. Implementation of recycled nutrient waste streams is currently a rapidly needed technology that will allow future food production by reducing the fossil fuel induced pollution while increasingly integrating these systems into green infrastructure.

STRUCTURE AND ACTIVITIES

INTRODUCTION

FarmTech Society (FTS) is an international non-profit industry association for the Controlled Environment
Agriculture (CEA) sector.
CEA employs advanced biomimicry practices, lowering climate risks while improving yields, ensuring clean
quality while upholding ecological and entrepreneurial principles.
Complementing regenerative with controlled farming practices, growing a lot more with a lot less space,
waste, water, along with fewer risks, pesticides, and pollution associated.CEA keeps the threat of pollution,
pests, and diseases out.
Creating optimal predictable growing conditions that empower existing struggling farmers to diversify their
operations, become circular, and help reach the goals of the decarbonization of agriculture while ensuring
food security and sovereignty.
Video Presentation
CEA Triple Transition Potential: sustainable agriculture, economic growth and food security
Complementing Agro-Ecological Farming with CEA will allow the health, food production and energy sector
in many economies and markets to transition into decarbonized industries that provide substantial career
opportunities while supporting food security and sovereignty.

ASSOCIATION

The FarmTech Society offers two kinds of membership:
Full membership: allows the fullest participation into the association activities. Full members are the only
members entitled to vote and advance proposals in the General Assembly, thus contributing to determining
the goals and objectives of the association.
Associate membership: aims at allowing a wider degree of participation to the association also to companies and individuals whose interests in the association's aims and objectives do not include the need
to take active part in the activities of FTS.

FTS engages with all its members, full and associate, equally. Members are the most important asset of FTS
and their interests and benefit is what has led to the foundation of FTS, knowing that a larger base of membership represents the key of success for advocating and promoting the CEA sector on a global scale.
1
FarmTech Society | Place du Place du Champs de Mars 5, 1050 Ixelles | +32 455 107751 | contact@farmtechsociety.org
ORGANIGRAM
General Assembly: assembles all members of FTS. It is the sovereign body of the association, the one in
charge of the general administration. It has all the powers that the law or the statutes do not assign to other
bodies. Composed by full members, entitled to vote and the associate members, who are supporting the
overall aim of the association with their membership fees and participations.
Board of Directors: its role is to organise and oversee the proper functioning of the association. Among its
functions there are the programming and monitoring of the various activities of the association, the management of the human resources, the implementation and development of Key Programs according to
the statutory objectives and goals. It is elected by the General Assembly.
Board of Advisors: appointed by the General Assembly, it is composed of experts and stakeholders. It provides advice to the Board of Directors and the General Assembly on all matters related to the management of the association and its activities.
Committees: composed by members and external experts bringing forward expertise and professional knowledge on different fields. They are appointed by the Board of Directors and work on macro areas of
interest such as:
Standardisation Committee: founded in 2021, works on the Benchmark Data Initiative and Global GAP redesign certificate 2023. It focuses on initiatives that help level the playing field in regulations and financing for the CEA sector. FTS and its network aim to represent an independent and sectorial authority. FTS engages in the development of an accurate annual industry report and initiates benchmarking and standards development for the sector.
2
FarmTech Society | Place du Place du Champs de Mars 5, 1050 Ixelles | +32 455 107751 | contact@farmtechsociety.org
Education Committee: founded in 2019, awarded EU Erasmus Plus Grant for online basic training course with new professional profile titled Hydroponic Technicians (under the ECVET creditsystem). Focuses mainly on knowledge transfer. Recognizable professional profiles in the emerging sectors are of great importance to scale the practice and overcome the severe shortage of talent. CEA can provide STEM based career opportunities to existing agriculture communities as well as attract new and existing talent from other industries. FTS provides independence in public initiatives, grants, validate content and training programs for the sector.
Policy Committee: will begin its activities in 2022. New technology and innovation system developments require development of a common narrative, recognition and representation in market wide new policy-development and adoptions of the practice in regulations. Public initiatives, grants, reporting and advocacy for the CEA sector representation are the main focus.
Daily Management Team (Secretariat): Gathering professionals and seasoned industry experts, implementing the three pronged strategies (standardisation, education and policy) devised by the Board of
Directors, ensure the day-to-day management of the association, membership and implementation, pursue
and develop all the necessary actions necessary to achieve the regulatory recognition of the CEA sector

within the EU and US markets and beyond.

KEY PROGRAMS

Members' Directory: FTS aims to develop a complete membership directory available on its website. The purpose is to provide a clear, accessible, immediate insight on the global FTS community. Consisting multimedia and informative original materials and information, will also serve to showcase the diversity of the sector.

Industry Newsletter and Reporting: FTS aims not only to be identified as a sectoral association but also as a reference point for what concerns the CEA at a global level. Distributing information and providing unique insights and reports on the industry and for the industry on an international level, FTS allows private and public stakeholders to access firsthand information on CEA and provide its members with indispensable business information and tools to strengthen their position and role in the agricultural sector.

Industry Content and Events: FTS, in its continued effort to provide its members with direct access to the most important international industry exhibitions and conferences, is able to offer free and/or discounted entries to several events every year. FTS is also invested directly in public debates and strives to position itself as a global media partner in key public initiatives.

REGIONAL AND GLOBAL COLLECTIVE ACTIONS

● Common sectoral strategy across relevant fragmented economies and initiatives (health, agriculture & energy policies) and towards different public actors (EU, UK, US, etc.)

● Establishment of certified VET industry profiles, training and facilities to meet the skills gap and develop careers opportunities serving the sector (public - private funding instruments)

● Benchmarking CEA with standardisation & data initiatives to provide validation while providing evidence of the benefits and growth potential of the emerging sector (standards, sustainable financing - taxonomy).

FarmTech Society | Place du Place du Champs de Mars 5, 1050 Ixelles | +32 455 107751 | contact@farmtechsociety.org

4. Feedback reference
F3250401
Submitted on
26 April 2022
Submitted by
Ewa Leś
User type
Non-governmental organisation (NGO)
Organisation
Coalition Clean Baltic (CCB)
Organisation size
Small (10 to 49 employees)
Transparency register number
8020151281
Country of origin
Poland
Initiative
Nutrients – action plan for better management

Dear European Commission, As two-thirds of the excessive nitrogen and phosphorus levels in waters originate from fertilizers in agriculture, our submission (attached) will focus on this aspect. CCB has, for more than 20 years, participated in HELCOM as an observer, with a focus on Baltic Sea eutrophication problems. Baltic eutrophication cannot be solved without strict control of today's Overfertilization Practices, which HELCOM contracting parties not have been able to handle properly. So we welcome this initiative from EC very much, which would have the potential to be an instrument that could handle and reduce Baltic Sea eutrophication. Our proposals (marked as *) for procedures and measures to minimize overfertilization and strengthen Nutrient Use Efficiency for agriculture can be seen as possibilities, where each action will improve nutrient use and reduce nutrient pollution if political support is given. With warm regards and wishing successful consultations, Ewa Les, CCB WA Eutrophication Leader

1
EC Call for evidence for an initiative “Nutrients – an action plan for better management”.
CCB comments and proposals for
an EU integrated nutrient management plan
Introduction
As two-thirds of the excessive nitrogen and phosphorus levels in waters originate from fertilizers in agriculture, our submission will focus on this aspect. CCB has, for more than 20 years, participated in HELCOM as an observer, with a focus on Baltic Sea eutrophication problems. Baltic eutrophication cannot be solved without strict control of today's Overfertilization Practices, which HELCOM contracting parties not have been able to handle properly. So we welcome this initiative from EC very much, which would have the potential to be an instrument that could handle and reduce Baltic Sea eutrophication.
Our proposals (marked as *) for procedures and measures to minimize overfertilization and strengthen Nutrient Use Efficiency for agriculture can be seen as possibilities, where each action will improve nutrient use and reduce nutrient pollution if political support is given.
Mandatory reporting on Nutrient accounting at the farm field level
Fundamental and basic information is needed for accurate and reliable nutrient

accounting, which should be mandatory for big farms within the EU.
The main problem is that farmers don't need to report on Nutrient Accounting and its Nutrient Surplus (as kg/ha at field level). Without such info, it is impossible to regulate and take action to reduce the nutrient surplus and losses. Mandatory Regulations have to be introduced. Reporting needs to be mandatory for farms and voluntary for small farms.
In fertilization planning farmer shall calculate nutrients for both N and P (compare Nitrates Directive, which is only focused on nitrogen content).
It is necessary to go into details about how a nutrient surplus shall be calculated, because the understanding of "nutrient surplus" differs widely between various stakeholders, and having requirements, using the wording "nutrient-balanced fertilization" is not enough. You must demand that the nutrient input (in soil and applied on soil, and deposited as NOx) is balanced with the crop on each field, with a realistic yield (average yield for this kind of crop at this field the last 5-10 years), to avoid overfertilization. So already at fertilization planning you can calculate the "nutrient surplus" at the field level, and discuss measures to minimize the nutrient surplus. Another way to avoid over-fertilization is to regularly test the soil (once every 2-3 years) for the content of N and P.
2
Nutrient accounting information from farmers has to be reported to national authorities, giving possibilities for summarized national reporting on nutrient surplus/overfertilization. Without such info, it will not be possible to monitor trends and influence/control for more efficient nutrient management.
Focus for requirements on nutrient accounting should be "site-specifically" on "field level", as farmgate level accounting does not give information on nutrient surplus from agricultural fields, and can hardly be used for actions to reach nutrient-balanced fertilization.
*All farms, farms (e.g. >10-20 ha and/or > 5-10 AU or importing > 1-ton manure/year), shall annually declare and report their purchase/storage of fertilizers (purchased chemical fertilizers; own farm manure amount and calculation of manure N&P-nutrients; import/export of manure and its nutrient content; other organic fertilizers incl. nutrient content). Comment: In Denmark, all farms are in an online database where the amounts of fertilizers purchased and used are registered. Such info is updated every year.
Stronger requirements for the Agriculture sector for Nutrient Use Efficiency and Nutrient-Balanced Fertilization
All nutrient losses from farmland come from overfertilization (two-thirds of the excessive nitrogen and phosphorus levels in waters originate from fertilizers in agriculture).
Many countries apply Economic Optimal Fertilization (EOF) practices, which always mean overfertilization. But farmers applying EOF, see themselves as a "nutrient balanced farmer", as they fertilize only to a level that is profitable for them, but usually with a high nutrient surplus that leads to nutrient losses.
Denmark had for 15 years, until 2015, a system where advisory service for farmers calculated for EOF, but the fertilization was reduced by 15%, to control overfertilization. Farmers could still produce crops with profits. This procedure resulted in lowered nutrient concentration in watercourses, easier reaching Good Ecological Water status, confirmed via studies by Danish institutions. Danish farmers' lobby work removed the described requirements, and a new system is under development, where the focus will be on clay soils, to have stronger requirements.
Germany has introduced a system for Nutrient-balanced fertilization with limits for "Tolerable surplus". Limits are set for nitrogen surplus 50-70 kg N/ha and for phosphorus surplus Zero kg P/ha. Calculations are mainly used as "Farmgate balance", after harvest, which makes it complicated to steer and adjust away from overfertilization. Nutrient balances and nutrient surplus should always be calculated at the "field level" during fertilization planning, which is an instrument that can be used to reduce overfertilization at the planning process. The German system and requirements are at present under revision.
3

*Introduce Mandatory requirements for farmers, at fertilization planning, for calculation of Nutrient Surplus, for both N and P, for various crops at field level.
Fertilization planning: Info on fertilizers application for each field and crop. Calculation of estimated nutrient surplus on field level for various crops (out from planned fertilizer use and estimated crop yield). The nutrient balance calculations should, besides the annual application of fertilizers, be included: the amount of nutrients in the soil content based on a soil map, e.g. from earlier manure applications; atmospheric nitrogen deposition; nitrogen fixation by crops.
*Request EU member states to develop national limits for tolerable N&P-surplus per hectare for crop farms (e.g. 20/30/40 kg N/ha) and livestock farms (e.g. 30-60 kg N/ha). P-surplus should always be zero kg/ha, or very close to zero.
* EU countries that apply Economic Optimal Fertilization (EOF) practices for farmland fertilization, should have requirements to reduce planned overfertilization, by reducing recommended EOF fertilizer application with 15-20%, to balance the nutrient requirements of the crop and the nutrient supply to the crops.
*Farms shall report planned ”Crop yield” for the selected fertilization rate at field level. Fertilization rates should be selected according to a realistic crop yield, e.g. the average crop yield for the last 5-10 years on various soils.
*Nutrient Use Efficiency in crop production after harvest as field-level balance: calculation of efficiency via Output (Nutrient content in harvested crop) and Input (nutrients in the soil; nutrients from earlier years of organic/manure fertilization; nitrogen (NOx) deposited at the soil; total N and P applied as fertilizers). Farms shall report the difference between nutrient inputs (see defined above) and nutrients removed with the harvest (kg N & P/ha). Such calculation and reporting should be mandatory for big farms in EU countries, Reported to control authorities and EC. Information on actual crop yields at the field level gives a basis to strengthen future Nutrient Use Efficiency.
*regular soil testing for N, P, and pH content (once every 2 years)
*Soil mapping - Nutrient content of the soil. To have accurate information for fertilization planning the nutrient content (P and N) in the soil must be reliable. The pH of soils, which influences nutrient availability, should also be monitored. Requirements for mandatory nutrient soil mapping, at least every 5 years, should be introduced.
A basis for Nutrient-balanced Fertilization with a low nutrient surplus
In a Portal paragraph, a requirement for all farmers have to fulfill, to have access to CAP subsidies, should say concerning “Application rates for fertilizer nutrients” :
*The application of nutrients in agricultural land shall be limited, based on a balance between the foreseeable nutrient requirements of the crop and the nutrient supply to the crops from the soil and the nutrients with a view to minimizing eutrophication.
4
This wording is included in HELCOM Helsinki Convention, Annex III “Criteria and Measures Concerning the Prevention of Pollution from Land-Based Sources”, Part II: Prevention of Pollution from Agriculture. It has been the base/fundament to discuss measures for Nutrient-balanced fertilization practices within HELCOM and would be a very important basis for all EU agricultural production to follow.
Control of overfertilization in areas/regions with an excess manure
Areas with a high concentration of livestock farming, having an excess of manure, usually result in overfertilization, as the economic distance to transport manure is approx. 100 km. Credible procedures need to be developed to calculate farmers' need for manure fertilizer for their own crop production, and the excess manure to be transported for processing, preferably to manure/organic fertilizer pellets. Such procedures are today applied in areas with a high density of pig livestock farming, e.g. in Belgium and France. Animal farming is still profitable for pig farming with such requirements.
The following proposed practices and measures would control and minimize overfertilization with manure and reach a better Nutrient Use Efficiency:
*Advisory service shall calculate manure needs for nutrient-balanced fertilization of the farmers' planned crops for the coming growing season

*Excess manure resources from one farm can be used for fertilization (controlled as nutrient-balanced) by neighboring farmers' crop production
*Excess manure shall be transported for processing to organic fertilizer products (e.g. via a cooperative organization supporting farmers).
*Introduce CAP subsidies, e.g. as an obligatory component of national CAP Strategic Plans, to promote agricultural production with the balance between livestock and crop production, where manure resources can be used nutrient-balanced with better nutrient use efficiency.
*Require that manure fertilization shall be nutrient-balanced both for N and P. Manure should not be allowed for spreading on soils saturated with P (high P-class), where the manure P-content will be just overfertilization.
Updated and new regulations to control overfertilization
Nitrates Directive
This directive limits the amount of livestock manure applied on farmland each year, which should not exceed the amount of manure containing 170 kg/ha of nitrogen. This kind of regulation does not limit overfertilization and does not secure Nutrient-balanced fertilization. The Directive should be updated with requirements on the calculation of
5
nutrient surplus per hectare (N and P) and limits (e.g. national) for tolerable nutrient surpluses for N and P.
The directive should be complemented with requirements also for Phosphorus fertilization from manure, and to secure that P-fertilization also will be nutrient-balanced. A problem today is that manure is often spread and applied on soils saturated with P (high P-class soils), which causes overfertilization with P. The farmer spreading manure may only be interested in the N-content in manure. Regulations should be introduced to control the spreading of manure on soils with high P-content. Calculations of P-surplus per hectare and tolerable P-surplus limits should be introduced to control P-overfertilization from manure.
Buffer strips
Buffer strips next to streams, rivers, and lakes are used to avoid negative environmental impacts. Benefits that buffer zones provide include improving water quality, enhancing fish and wildlife habitat, protecting soil resources, and beautifying the landscape. Most buffers will perform more than one function.
The establishment and management of vegetated strips adjacent to farmed fields are key mitigation measures to prevent or minimize negative environmental impacts from agriculture. Vegetated strips may have a multi-functionality that covers a range of processes, including protection of water quality in surface waters and soil conservation of slopes, habitat improvement, biodiversity, shading, carbon sequestration, flow capture, and biomass production, landscape diversity, and societal services. buffer strips should be adopted adjacent to all rivers, streams and lakes in agricultural areas to mitigate the negative effects of the application of chemical fertilizers and pesticides.
Various countries have totally different views on what buffer stripes can be. Some countries apply buffer stripes mainly for sloping farmland (not horizontal). In Latvia, you can have cultivated farmland just next to a ditch, but you may not be allowed to put on fertilizer for a 3-5 m stripe closest to the ditch. That is called a "buffer stripes". Another problem is that countries can change its requirement within a few years, according to new politics and farmers' lobby. Denmark had a requirement for 10 m buffer stripes for many years, but this is now removed.
*EC/EU should by setting a definition and requirements for buffer stripes and in this way give continuity for constant requirements for EU farmlands, to reduce nutrient leakage from agricultural land.
*EC/EU should set up minimum requirements for buffer stripes, defined as a strip where the soil is vegetated with plants, grass, bushes/trees, that can adsorb leaking nutrients from nearby farmland. Buffer stripes should be at least 5 m from a ditch's lowest point/shoreline of a stream/watercourse to the cultivated farmland, in the

horizontal direction.
6
Tax on fertilizers
A tax on mineral fertilizers would curb the leaching of nutrients into streams, rivers and lakes. A fertilizer tax provides an incentive to reduce generous and excessive ‘insurance’ applications of fertilizer. It also can promote substitution through improved utilization of nutrients in organic fertilizer from farm animals and can facilitate manure trade between livestock and arable crop farmers. A tax on fertilizers also will operationalize the implementation of the ‘the polluter pays principle.
* impose a tax on fertilizers.
Prepared 26.04.2022 by:
Gunnar Noren,
Maria Staniszewska,
Mia Svedäng,
Ewa Leś
on behalf of

5. Feedback reference
F3250389
Submitted on
26 April 2022
Submitted by
Marc-Andree WOLF
User type
Company/business
Organisation
maki Consulting GmbH
Organisation size
Micro (1 to 9 employees)
Transparency register number
687190237996-89
Country of origin
Germany
Initiative
Nutrients – action plan for better management

A coordinated, integrated nutrient management plan is a very welcome, overdue framework to align existing and future policies to improve the overall performance of the agricultural sector, while considering non-agriculture N and P sources and losses as well. In order to be as directionally reliable as possible, we want to highlight here some aspects that are in the current debate not fully appreciated but need to be at the core of the plan: Explicitly and quantitatively consider interrelationship with environmental impacts, foremost land use (occupation and transformation, both directly and indirectly), but also others. Avoid shortcuts and simplifications, for example do not require crop-unspecific fertiliser reduction targets (as relative losses differ hugely by crop). Ensure that yield reductions due to lower amount of applied N fertiliser are fully considered. E.g. organic agriculture has substantially lower yields (between -10 and -50%, especially high for mass products such as grains), among others caused by lower fertilisation levels. Such reduced yield has critical consequences: less harvest means that more natural ecosystems have to be converted to farmland, as the demand for agricultural products is as it is. These natural ecosystems to be lost would be mostly outside Europe, as conversion of European forests to agriculture is argued to see even

stronger rejection from citizen than already. In other words: more organic agriculture in Europe leads to more deforestation in the tropics. A general push for organic agriculture would hence be wrong (noting that similar N losses can be achieved in conventional and organic agriculture). As to biodiversity: While it is surely good to have more biodiversity in organic farmland compared to conventional farmland, the extra species that occur are rarely threatened, while those lost in the converted forests are. Take a life cycle perspective of measures and effects, using the Commission's Product Environmental Footprint (PEF) approach, but also – for consequential analysis and indirect land use effects – the Commission's 2010 ILCD Handbook, General guidance. Recommendation: The explicit aim of the integrated nutrient management plan for agriculture should be to define and promote overall environmentally optimised farming systems (in life cycle perspective) that consider yield, N and P species emissions and related eutrophication impacts, impact of fertiliser production and management, land occupation and conversion (direct and indirect), biodiversity and ecosystem stability, as well as climate change and other impacts. Such new, sustainable farming systems should take the best from both conventional and organic agriculture. Such would include synthetic and organic fertiliser in improved application schemes (i.e. not in autumn after harvest or too early before spring sowing, injecting manure and not spreading or putting on soil surface), some pesticides (while less substances and less amounts) and/or optimised biological pest control (possibly with some financial incentives), optimised other management measures - differentiated per crop, region and even site (e.g. erosion control, soil structure improvement). More research into biological pest control might be warranted, and finance or other incentives for extended manure storage at farms and for manure injection machines. The rest of the economy would contribute, particularly waste water treatment plants, that should recover more nutrients, sanitize the sludge and bring to agricultural land, while removing/preventing pollutants, particularly heavy metals to be spread to the land. maki Consulting GmbH is a small life cycle expert consulting firm of Dr.-Ing. Marc-Andree Wolf and Kirana (Chomkhamsri) Wolf. Marc and Kirana have over 20 years', respectively 15 years' working experience in LCA, PEF and related areas in government (both at the European Commission, Kirana also at Thai NSTDA), at consulting companies, and in research.

6. Feedback reference
F3250377
Submitted on
26 April 2022
Submitted by
Carbon Farming Coalition
User type
Business association
Organisation
Carbon+ Farming Coalition
Organisation size
Large (250 or more)
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

Farmers are the basis of the EU's food and agriculture systems, hence no just transition towards sustainability in these systems is possible without farmer-centric solutions. Farmers

are the stewards of 40% of EU's land and any changes to be promoted will inherently involve them. Therefore, it is essential to understand the challenges they face to increase the sustainability performance of their farms and operations in order to design and put in place the necessary solutions that unlock a just and effective transition. Given the complexity and the interconnectedness of food and agriculture systems, increasing sustainability performance requires ambitious multistakeholder action. Stepping up to the challenge, a coalition of corporations (BASF, Bayer Crop Science, Cropin, EIT Food, Hero, Planet, RAGT, Swiss Re, Syngenta, World Economic Forum, Yara, Zurich Insurance Group), NGOs (ECAF) and academics (University of Glasgow Adam Smith Business School), in consultation with farmer organizations, have convened under the EU Carbon+ Farming Coalition to understand the main farm-level barriers to the transition and develop adequate farmer-centric, practical and scalable solutions that support the transformation towards climate-smart agriculture. Based on the insights generated through a surveying 1.500+ farmers across 10 different crop-country combinations (CCC) (covering 7 countries and 6 cropping systems), the EU Carbon+ Farming Coalition (the Coalition) is committed to accelerate sustainability in farming by showcasing the feasibility and impact of potential solutions to identified farmer challenges. Work packages will specifically focus on key intervention areas: the enhancement of knowledge-sharing mechanisms for farmers, the optimization of interactions between farmers and other stakeholders in the value chain to promote sustainable farming operations, the identification of cost-effective MRV solutions to help build a reliable carbon market, the design of innovative risk sharing and management options to shield farms' economic viability in the transition, and the promotion of climate-smart practices in specific crop segments and Integrated Landscape Management solutions in vulnerable environments to capture the synergic effect created by combining all applicable transformative elements. The willingness of the Coalition's members to jointly design and execute this program of work demonstrates the transformative power of pre-competitive collaboration amongst private sector actors, civil society and farmers. The end goal of this collaborative effort is that outcomes inspire and guide stakeholders in other regions and countries to move into action to support this critical transition.

7. Feedback reference
F3250359
Submitted on
26 April 2022
Submitted by
Sara Johansson
User type
Environmental organisation
Organisation
European Environmental Bureau
Organisation size
Medium (50 to 249 employees)
Transparency register number
06798511314-27
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

EEB welcomes the initiative for an EU action plan for integrated nutrient management (INMAP). The war in Ukraine has highlighted the EU's dependency on imports of fertiliser and livestock feed, but even though our current food system is relying on limited raw materials and fossil gas, we are using these resources in a wasteful way with huge losses from field to plate. Only 20% of mined phosphorus ends up on the plate. For nitrogen this number is even lower. Globally, a third of produced food is lost or wasted, representing a quarter of the fertilizer used. In Europe, we need to drastically reduce nutrient losses to return to safe levels within the planetary boundaries. Nutrient pollution, from agriculture, industry and households, have dire consequences for the environment, including eutrophication, nitrate pollution of groundwater, greenhouse gas emissions and biodiversity loss. The cost of water pollution due to excess nitrogen and phosphorus is more than €22 billion per year, a cost that is largely not born by the polluters. The upcoming INMAP is an opportunity to take a holistic approach to nutrient losses from all these sources. The revision of the Urban Wastewater Treatment Directive offers an opportunity to decrease untreated wastewater discharges, put in place stricter nutrient emission limits and promote reuse of nutrients. Nature-based solutions can help reduce storm water overflows and for wastewater treatment in sparsely populated areas. However, recycling from waste streams must be accompanied by a reduction of input. Excessive protein consumption increases nitrogen load to wastewater treatment plants, while lower intake of protein-rich food can yield significant load reductions to receiving waters. When preparing the INMAP the European Commission should consider the work done by the Task Force on Reactive Nitrogen, and other Task Forces, under the Long-Range Transboundary Air Pollution Convention, including their recommendations on how to reduce NH3 emissions. The actions promoted by this plan should contribute to at least the achievement of the existing National Emission Ceilings Directive (NECD)' objectives for NH3 (in the EU the 94% of NH3 emissions originate from the agricultural sector) so to reduce the total amount and concentrations of nitrogen in the environment. In addition, the revision of the Ambient Air Quality Directives offers the opportunity to establish air quality standards for ammonia emissions: this action plan should already pave the way for coherent steps being taken on this. The INMAP should keep up the ambition of the Green Deal and its Zero Pollution Action Plan, Farm to Fork and Biodiversity Strategies that sets out to reduce nutrient losses by at least 50%, which will reduce the use of fertilisers by at least 20% by 2030. We need to move towards clear reductions in the use of fertilisers and towards circular nutrients management. Food waste must rapidly be halved throughout the supply chain. Better nutrient management must be accompanied by a just and speedy transition away from industrial animal farming and towards extensive and mixed farming systems, and 'less and better' meat, dairy and egg consumption. Agroecology can offer guiding principles to improve the management and increase the efficiency of nutrient use in agricultural landscapes and transition away from high input agricultural systems. Urgent action is needed to tackle eutrophication and to address nutrient pollution at source. All EU institutions should fully embrace the zero-pollution ambition and remain committed to engage with decision-makers on the further development and roll out of the ZPAP, as well as helping mainstream – at EU and national levels - zero pollution ambition across policy, legislation and funding, and strengthen measures to minimise non-compliance. EEB is at the disposal of the Commission for any requests it may have and would be pleased to offer its expertise in the legislative proposal.

Feedback reference
F3250402
Submitted on
26 April 2022
Submitted by
Thomas Zollner
User type
Business association
Organisation
FarmTech Society
Organisation size
Micro (1 to 9 employees)
Transparency register number
469686733585-87
Country of origin
Belgium
Initiative
Nutrients – action plan for better management

FTS is an industry association representing the Controlled Environment Agriculture (CEA) sector, a fast-evolving emerging solution that potentially offers great improvement for the inclusiveness, sustainability, and competitiveness of all food systems, in line with the EU policy objectives and Green Deal goals. CEA deploys technology that is based on imitating natural processes (i.e. biomimicry) in a way that intensifies crop yield, while cutting out pests & diseases, reducing climate and supply chain risks, intensifying yield, improving nutrition & quality, and upholding ecological - and entrepreneurial principles. CEA helps to address the dilemma of outdated, unsustainable and economically unviable practices by helping growers to extensify their field practice (restoring soils and biodiversity), by integrating intensive agro-ecological CEA methods on small footprints, achieving higher yields with a fraction of the land, typically in “non agricultural” areas, such brownfields or outdated farming economy buildings spaces. Thanks to its biomimicry applications and technologies, CEA allows growers the complete steering of the growing process and managing all agriculture inputs with circular principles. As policy-makers consider the scope of the proposal and its interlinkages with other policies, FTS highlights several key points, which are crucial for the development for a multidimensional sustainability of food systems and achieve a roadmap towards a resilient and sustainable food system : 1. Circular Resource Efficiencies — CEA based food systems preserve and strengthen the circular and much needed principles for nutrition and irrigation recycling. The EU is currently the market leader in CEA technology thanks to the mature greenhouse technology from the Netherlands, Belgium and Spain, alongside a deep knowledge base, innovation clusters in seed development and general superb plant growing experience in CEA. This significant knowledge - and technology base not only needs recognition for its transformation potential, but also recognition as a solution provider to a wider agriculture production in rural communities helping to curb pollution of the waterways by excess nutrients while delivering the yields in clean and healthy nutrition and offering exciting new career opportunities to existing and emerging agriculture communities. FTS calls the EU Commission to consider the exceptional relevance of the CEA industry in shaping and bolstering the sustainability, competitiveness and resilience of

EU food systems. 2. Digitalization and Career Creation / Generational Renewal — Digitized food systems contribute not only to the EU's competitiveness in the global arena, but also increases performance with regards to resource efficiency, land and water usage, crop yield and transparency. Socially sustainable and resilient food systems rely on an attractive agriculture sector and the renewal of the workforce basis, since a third of EU farmers will need successors over the next 15 years. The digitalization of agriculture offers exciting (digital based) work perspectives for new generations and professionals from STEM backgrounds, particularly those with great interests in agri-food careers but shying away from rural isolation and strenuous labor conditions. 3. Decarbonization / Climate Adaptation — CEA systems ensure healthy food for all without exacerbating climate change and polluting ecosystems. Hybrid agri-food systems utilizing CEA integrated into field practices can be designed and implemented with circular practices and based on renewable energy and circular waste streams. Implementation of recycled nutrient waste streams is currently a rapidly needed technology that will allow future food production by reducing the fossil fuel induced pollution while increasingly integrating these systems into green infrastructure.

STRUCTURE AND ACTIVITIES

INTRODUCTION

FarmTech Society (FTS) is an international non-profit industry association for the Controlled Environment
Agriculture (CEA) sector.
CEA employs advanced biomimicry practices, lowering climate risks while improving yields, ensuring clean
quality while upholding ecological and entrepreneurial principles.
Complementing regenerative with controlled farming practices, growing a lot more with a lot less space,
waste, water, along with fewer risks, pesticides, and pollution associated.CEA keeps the threat of pollution,
pests, and diseases out.
Creating optimal predictable growing conditions that empower existing struggling farmers to diversify their
operations, become circular, and help reach the goals of the decarbonization of agriculture while ensuring
food security and sovereignty.
Video Presentation
CEA Triple Transition Potential: sustainable agriculture, economic growth and food security
Complementing Agro-Ecological Farming with CEA will allow the health, food production and energy sector
in many economies and markets to transition into decarbonized industries that provide substantial career
opportunities while supporting food security and sovereignty.

ASSOCIATION

The FarmTech Society offers two kinds of membership:
Full membership: allows the fullest participation into the association activities. Full members are the only
members entitled to vote and advance proposals in the General Assembly, thus contributing to determining
the goals and objectives of the association.
Associate membership: aims at allowing a wider degree of participation to the association also to companies and individuals whose interests in the association's aims and objectives do not include the need
to take active part in the activities of FTS.

FTS engages with all its members, full and associate, equally. Members are the most important asset of FTS
and their interests and benefit is what has led to the foundation of FTS, knowing that a larger base of membership represents the key of success for advocating and promoting the CEA sector on a global scale.

FarmTech Society | Place du Place du Champs de Mars 5, 1050 Ixelles | +32 455 107751 | contact@farmtechsociety.org
ORGANIGRAM
General Assembly: assembles all members of FTS. It is the sovereign body of the association, the one in
charge of the general administration. It has all the powers that the law or the statutes do not assign to other
bodies. Composed by full members, entitled to vote and the associate members, who are supporting the
overall aim of the association with their membership fees and participations.
Board of Directors: its role is to organise and oversee the proper functioning of the association. Among its
functions there are the programming and monitoring of the various activities of the association, the management of the human resources, the implementation and development of Key Programs according to
the statutory objectives and goals. It is elected by the General Assembly.
Board of Advisors: appointed by the General Assembly, it is composed of experts and stakeholders. It provides advice to the Board of Directors and the General Assembly on all matters related to the management of the association and its activities.
Committees: composed by members and external experts bringing forward expertise and professional knowledge on different fields. They are appointed by the Board of Directors and work on macro areas of
interest such as:
Standardisation Committee: founded in 2021, works on the Benchmark Data Initiative and Global GAP redesign certificate 2023. It focuses on initiatives that help level the playing field in regulations and financing for the CEA sector. FTS and its network aim to represent an independent and sectorial authority. FTS engages in the development of an accurate annual industry report and initiates benchmarking and standards development for the sector.

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Education Committee: founded in 2019, awarded EU Erasmus Plus Grant for online basic training course with new professional profile titled Hydroponic Technicians (under the ECVET creditsystem). Focuses mainly on knowledge transfer. Recognizable professional profiles in the emerging sectors are of great importance to scale the practice and overcome the severe shortage of talent. CEA can provide STEM based career opportunities to existing agriculture communities as well as attract new and existing talent from other industries. FTS provides independence in public initiatives, grants, validate content and training programs for the sector.
Policy Committee: will begin its activities in 2022. New technology and innovation system developments require development of a common narrative, recognition and representation in market wide new policy-development and adoptions of the practice in regulations. Public initiatives, grants, reporting and advocacy for the CEA sector representation are the main focus.
Daily Management Team (Secretariat): Gathering professionals and seasoned industry experts, implementing the three pronged strategies (standardisation, education and policy) devised by the Board of
Directors, ensure the day-to-day management of the association, membership and implementation, pursue
and develop all the necessary actions necessary to achieve the regulatory recognition of the CEA sector

within the EU and US markets and beyond.

KEY PROGRAMS

Members' Directory: FTS aims to develop a complete membership directory available on its website. The purpose is to provide a clear, accessible, immediate insight on the global FTS community. Consisting multimedia and informative original materials and information, will also serve to showcase the diversity of the sector.

Industry Newsletter and Reporting: FTS aims not only to be identified as a sectoral association but also as a reference point for what concerns the CEA at a global level. Distributing information and providing unique insights and reports on the industry and for the industry on an international level, FTS allows private and public stakeholders to access firsthand information on CEA and provide its members with indispensable business information and tools to strengthen their position and role in the agricultural sector.

Industry Content and Events: FTS, in its continued effort to provide its members with direct access to the most important international industry exhibitions and conferences, is able to offer free and/or discounted entries to several events every year. FTS is also invested directly in public debates and strives to position itself as a global media partner in key public initiatives.

REGIONAL AND GLOBAL COLLECTIVE ACTIONS

● Common sectoral strategy across relevant fragmented economies and initiatives (health, agriculture & energy policies) and towards different public actors (EU, UK, US, etc.)

● Establishment of certified VET industry profiles, training and facilities to meet the skills gap and develop careers opportunities serving the sector (public - private funding instruments)

● Benchmarking CEA with standardisation & data initiatives to provide validation while providing evidence of the benefits and growth potential of the emerging sector (standards, sustainable financing - taxonomy).

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1. Feedback reference

F3250407
Submitted on
26 April 2022
Submitted by
Kaj Granholm
User type
EU citizen
Country of origin
Finland
Initiative
Nutrients – action plan for better management

This input to the Call for evidence is provided on behalf of the Interreg Platform project SuMaNu (balticsumanu.eu). SuMaNu supports the Commission's initiative on Integrated Nutrient Management to reduce negative environmental effects (climate change, air pollution, eutrophication and loss of habitats and biodiversity) from excess nutrients lost from agricultural activities. Agricultural nutrient management should be based on soil fertility analyses, sustainable crop rotation and utilization of fertilizers and soil improvers of organic origin, i.e. recycled from e.g. animal manure and municipal and industrial side-streams. Animal manure is an integral resource for nutrient recycling containing the largest share of the recyclable nutrients. Proper methods and calculation tools to assess nutrient content in different manures should be used to ensure efficient nutrient recycling within agriculture. Such have just been developed in a regional Interreg project MANURE STANDARDS which is part of the SuMaNu platform (www.luke.fi/manurestandards/en) and the results are usable in all EU. Further research and knowledge on bio-based fertilisers and their use is produced i.a. by the Horizon 2020 project Lex4bio (lex4bio.eu,Https://www.phosphorusplatform.eu/platform/espp-members-2/1884-lex4bio). The project has constituted that the amount of organic biomasses produced would cover 65% of the nitrogen and 130% of the phosphorus need for fertilizer use in Europe. This represents true potential to reduce fossil dependency but requires strategic measures and inclusive approach. Concerning the use of sewage sludge in agriculture, including the fertilizer use of digestate from anaerobic fermentation of sewage sludge, it is important to safeguard hygienic safety. Co-processing of sewage sludge and manure is not advisable as the risks related to trace elements, organic contaminants and hygiene are typically higher in sewage sludge than in manure. It should be also noted, that phosphorus fertilisation value of sewage sludge is depressed by Fe-salts, commonly used as phosphorus precipitation chemicals at WWTPs. Manure based phosphorus is comparable to mineral fertiliser and co-processing may depress phosphorus fertilisation value of manure. In the use of sewage sludge, the contamination as well as nutrient runoff risks should be minimized regardless of its use or disposal in any form or for any purpose. Overall, integrated nutrient management should encompass all levels, from farm level to the global level. To address regional nutrient surpluses, SuMaNu welcomes solutions to facilitate regional reallocation of nutrients from surplus to deficit areas and to advance manure processing. Although the probable future growth of farm size by LSU brings huge risks for unsustainable manure nutrient application, it also allows more options for economically feasible manure processing. Moreover, with increasing farm size manure processing can and should be made obligatory. This may help regional re-distribution of manure nutrients if the demand side follows pace.

Feedback reference
F3250401
Submitted on
26 April 2022
Submitted by
Ewa Leś
User type
Non-governmental organisation (NGO)
Organisation
Coalition Clean Baltic (CCB)
Organisation size
Small (10 to 49 employees)
Transparency register number
8020151281
Country of origin
Poland
Initiative
Nutrients – action plan for better management

Dear European Commission, As two-thirds of the excessive nitrogen and phosphorus levels in waters originate from fertilizers in agriculture, our submission (attached) will focus on this aspect. CCB has, for more than 20 years, participated in HELCOM as an observer, with a focus on Baltic Sea eutrophication problems. Baltic eutrophication cannot be solved without strict control of today's Overfertilization Practices, which HELCOM contracting parties not have been able to handle properly. So we welcome this initiative from EC very much, which would have the potential to be an instrument that could handle and reduce Baltic Sea eutrophication. Our proposals (marked as *) for procedures and measures to minimize overfertilization and strengthen Nutrient Use Efficiency for agriculture can be seen as possibilities, where each action will improve nutrient use and reduce nutrient pollution if political support is given. With warm regards and wishing successful consultations, Ewa Les, CCB WA Eutrophication Leader

1
EC Call for evidence for an initiative “Nutrients – an action plan for better management”.
CCB comments and proposals for
an EU integrated nutrient management plan
Introduction
As two-thirds of the excessive nitrogen and phosphorus levels in waters originate from fertilizers in agriculture, our submission will focus on this aspect. CCB has, for more than 20 years, participated in HELCOM as an observer, with a focus on Baltic Sea eutrophication problems. Baltic eutrophication cannot be solved without strict control of today's Overfertilization Practices, which HELCOM contracting parties not have been able to handle properly. So we welcome this initiative from EC very much, which would have the potential to be an instrument that could handle and reduce Baltic Sea eutrophication.
Our proposals (marked as *) for procedures and measures to minimize overfertilization and strengthen Nutrient Use Efficiency for agriculture can be seen as possibilities, where each action will improve nutrient use and reduce nutrient pollution if political support is given.
Mandatory reporting on Nutrient accounting at the farm field level
Fundamental and basic information is needed for accurate and reliable nutrient

accounting, which should be mandatory for big farms within the EU.
The main problem is that farmers don't need to report on Nutrient Accounting and its Nutrient Surplus (as kg/ha at field level). Without such info, it is impossible to regulate and take action to reduce the nutrient surplus and losses. Mandatory Regulations have to be introduced. Reporting needs to be mandatory for farms and voluntary for small farms.
In fertilization planning farmer shall calculate nutrients for both N and P (compare Nitrates Directive, which is only focused on nitrogen content).
It is necessary to go into details about how a nutrient surplus shall be calculated, because the understanding of "nutrient surplus" differs widely between various stakeholders, and having requirements, using the wording "nutrient-balanced fertilization" is not enough. You must demand that the nutrient input (in soil and applied on soil, and deposited as NOx) is balanced with the crop on each field, with a realistic yield (average yield for this kind of crop at this field the last 5-10 years), to avoid overfertilization. So already at fertilization planning you can calculate the "nutrient surplus" at the field level, and discuss measures to minimize the nutrient surplus. Another way to avoid over-fertilization is to regularly test the soil (once every 2-3 years) for the content of N and P.
2
Nutrient accounting information from farmers has to be reported to national authorities, giving possibilities for summarized national reporting on nutrient surplus/overfertilization. Without such info, it will not be possible to monitor trends and influence/control for more efficient nutrient management.
Focus for requirements on nutrient accounting should be "site-specifically" on "field level", as farmgate level accounting does not give information on nutrient surplus from agricultural fields, and can hardly be used for actions to reach nutrient-balanced fertilization.
*All farms, farms (e.g. >10-20 ha and/or > 5-10 AU or importing > 1-ton manure/year), shall annually declare and report their purchase/storage of fertilizers (purchased chemical fertilizers; own farm manure amount and calculation of manure N&P-nutrients; import/export of manure and its nutrient content; other organic fertilizers incl. nutrient content). Comment: In Denmark, all farms are in an online database where the amounts of fertilizers purchased and used are registered. Such info is updated every year.
Stronger requirements for the Agriculture sector for Nutrient Use Efficiency and Nutrient-Balanced Fertilization
All nutrient losses from farmland come from overfertilization (two-thirds of the excessive nitrogen and phosphorus levels in waters originate from fertilizers in agriculture).
Many countries apply Economic Optimal Fertilization (EOF) practices, which always mean overfertilization. But farmers applying EOF, see themselves as a "nutrient balanced farmer", as they fertilize only to a level that is profitable for them, but usually with a high nutrient surplus that leads to nutrient losses.
Denmark had for 15 years, until 2015, a system where advisory service for farmers calculated for EOF, but the fertilization was reduced by 15%, to control overfertilization. Farmers could still produce crops with profits. This procedure resulted in lowered nutrient concentration in watercourses, easier reaching Good Ecological Water status, confirmed via studies by Danish institutions. Danish farmers' lobby work removed the described requirements, and a new system is under development, where the focus will be on clay soils, to have stronger requirements.
Germany has introduced a system for Nutrient-balanced fertilization with limits for "Tolerable surplus". Limits are set for nitrogen surplus 50-70 kg N/ha and for phosphorus surplus Zero kg P/ha. Calculations are mainly used as "Farmgate balance", after harvest, which makes it complicated to steer and adjust away from overfertilization.
Nutrient balances and nutrient surplus should always be calculated at the "field level" during fertilization planning, which is an instrument that can be used to reduce overfertilization at the planning process. The German system and requirements are at present under revision.
3

*Introduce Mandatory requirements for farmers, at fertilization planning, for calculation of Nutrient Surplus, for both N and P, for various crops at field level.
Fertilization planning: Info on fertilizers application for each field and crop. Calculation of estimated nutrient surplus on field level for various crops (out from planned fertilizer use and estimated crop yield). The nutrient balance calculations should, besides the annual application of fertilizers, be included: the amount of nutrients in the soil content based on a soil map, e.g. from earlier manure applications; atmospheric nitrogen deposition; nitrogen fixation by crops.
*Request EU member states to develop national limits for tolerable N&P-surplus per hectare for crop farms (e.g. 20/30/40 kg N/ha) and livestock farms (e.g. 30-60 kg N/ha). P-surplus should always be zero kg/ha, or very close to zero.
* EU countries that apply Economic Optimal Fertilization (EOF) practices for farmland fertilization, should have requirements to reduce planned overfertilization, by reducing recommended EOF fertilizer application with 15-20%, to balance the nutrient requirements of the crop and the nutrient supply to the crops.
*Farms shall report planned ”Crop yield” for the selected fertilization rate at field level. Fertilization rates should be selected according to a realistic crop yield, e.g. the average crop yield for the last 5-10 years on various soils.
*Nutrient Use Efficiency in crop production after harvest as field-level balance: calculation of efficiency via Output (Nutrient content in harvested crop) and Input (nutrients in the soil; nutrients from earlier years of organic/manure fertilization; nitrogen (NOx) deposited at the soil; total N and P applied as fertilizers). Farms shall report the difference between nutrient inputs (see defined above) and nutrients removed with the harvest (kg N & P/ha). Such calculation and reporting should be mandatory for big farms in EU countries, Reported to control authorities and EC. Information on actual crop yields at the field level gives a basis to strengthen future Nutrient Use Efficiency.
*regular soil testing for N, P, and pH content (once every 2 years)
*Soil mapping - Nutrient content of the soil. To have accurate information for fertilization planning the nutrient content (P and N) in the soil must be reliable. The pH of soils, which influences nutrient availability, should also be monitored. Requirements for mandatory nutrient soil mapping, at least every 5 years, should be introduced.
A basis for Nutrient-balanced Fertilization with a low nutrient surplus
In a Portal paragraph, a requirement for all farmers have to fulfill, to have access to CAP subsidies, should say concerning “Application rates for fertilizer nutrients” :
*The application of nutrients in agricultural land shall be limited, based on a balance between the foreseeable nutrient requirements of the crop and the nutrient supply to the crops from the soil and the nutrients with a view to minimizing eutrophication.
4
This wording is included in HELCOM Helsinki Convention, Annex III “Criteria and Measures Concerning the Prevention of Pollution from Land-Based Sources”, Part II: Prevention of Pollution from Agriculture. It has been the base/fundament to discuss measures for Nutrient-balanced fertilization practices within HELCOM and would be a very important basis for all EU agricultural production to follow.
Control of overfertilization in areas/regions with an excess manure
Areas with a high concentration of livestock farming, having an excess of manure, usually result in overfertilization, as the economic distance to transport manure is approx. 100 km. Credible procedures need to be developed to calculate farmers' need for manure fertilizer for their own crop production, and the excess manure to be transported for processing, preferably to manure/organic fertilizer pellets. Such procedures are today applied in areas with a high density of pig livestock farming, e.g. in Belgium and France. Animal farming is still profitable for pig farming with such requirements.
The following proposed practices and measures would control and minimize overfertilization with manure and reach a better Nutrient Use Efficiency:
*Advisory service shall calculate manure needs for nutrient-balanced fertilization of the farmers' planned crops for the coming growing season

*Excess manure resources from one farm can be used for fertilization (controlled as nutrient-balanced) by neighboring farmers' crop production
*Excess manure shall be transported for processing to organic fertilizer products (e.g. via a cooperative organization supporting farmers).
*Introduce CAP subsidies, e.g. as an obligatory component of national CAP Strategic Plans, to promote agricultural production with the balance between livestock and crop production, where manure resources can be used nutrient-balanced with better nutrient use efficiency.
*Require that manure fertilization shall be nutrient-balanced both for N and P. Manure should not be allowed for spreading on soils saturated with P (high P-class), where the manure P-content will be just overfertilization.
Updated and new regulations to control overfertilization
Nitrates Directive
This directive limits the amount of livestock manure applied on farmland each year, which should not exceed the amount of manure containing 170 kg/ha of nitrogen. This kind of regulation does not limit overfertilization and does not secure Nutrient-balanced fertilization. The Directive should be updated with requirements on the calculation of

nutrient surplus per hectare (N and P) and limits (e.g. national) for tolerable nutrient surpluses for N and P.
The directive should be complemented with requirements also for Phosphorus fertilization from manure, and to secure that P-fertilization also will be nutrient-balanced. A problem today is that manure is often spread and applied on soils saturated with P (high P-class soils), which causes overfertilization with P. The farmer spreading manure may only be interested in the N-content in manure. Regulations should be introduced to control the spreading of manure on soils with high P-content. Calculations of P-surplus per hectare and tolerable P-surplus limits should be introduced to control P-overfertilization from manure.
Buffer strips
Buffer strips next to streams, rivers, and lakes are used to avoid negative environmental impacts. Benefits that buffer zones provide include improving water quality, enhancing fish and wildlife habitat, protecting soil resources, and beautifying the landscape. Most buffers will perform more than one function.
The establishment and management of vegetated strips adjacent to farmed fields are key mitigation measures to prevent or minimize negative environmental impacts from agriculture. Vegetated strips may have a multi-functionality that covers a range of processes, including protection of water quality in surface waters and soil conservation of slopes, habitat improvement, biodiversity, shading, carbon sequestration, flow capture, and biomass production, landscape diversity, and societal services. buffer strips should be adopted adjacent to all rivers, streams and lakes in agricultural areas to mitigate the negative effects of the application of chemical fertilizers and pesticides.
Various countries have totally different views on what buffer stripes can be. Some countries apply buffer stripes mainly for sloping farmland (not horizontal). In Latvia, you can have cultivated farmland just next to a ditch, but you may not be allowed to put on fertilizer for a 3-5 m stripe closest to the ditch. That is called a "buffer stripes". Another problem is that countries can change its requirement within a few years, according to new politics and farmers' lobby. Denmark had a requirement for 10 m buffer stripes for many years, but this is now removed.
*EC/EU should by setting a definition and requirements for buffer stripes and in this way give continuity for constant requirements for EU farmlands, to reduce nutrient leakage from agricultural land.
*EC/EU should set up minimum requirements for buffer stripes, defined as a strip where the soil is vegetated with plants, grass, bushes/trees, that can adsorb leaking nutrients from nearby farmland. Buffer stripes should be at least 5 m from a ditch's lowest point/shoreline of a stream/watercourse to the cultivated farmland, in the

horizontal direction.
6
Tax on fertilizers
A tax on mineral fertilizers would curb the leaching of nutrients into streams, rivers and lakes. A fertilizer tax provides an incentive to reduce generous and excessive ‘insurance’ applications of fertilizer. It also can promote substitution through improved utilization of nutrients in organic fertilizer from farm animals and can facilitate manure trade between livestock and arable crop farmers. A tax on fertilizers also will operationalize the implementation of the ‘the polluter pays principle.
* impose a tax on fertilizers.
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Initiative
Nutrients – action plan for better management

Farmers are the basis of the EU's food and agriculture systems, hence no just transition towards sustainability in these systems is possible without farmer-centric solutions. Farmers are the stewards of 40% of EU's land and any changes to be promoted will inherently involve them. Therefore, it is essential to understand the challenges they face to increase the sustainability performance of their farms and operations in order to design and put in place the necessary solutions that unlock a just and effective transition. Given the complexity and the interconnectedness of food and agriculture systems, increasing sustainability performance requires ambitious multistakeholder action. Stepping up to the challenge, a coalition of corporations (BASF, Bayer Crop Science, Cropin, EIT Food, Hero, Planet, RAGT, Swiss Re, Syngenta, World Economic Forum, Yara, Zurich Insurance Group), NGOs (ECAF) and academics (University of Glasgow Adam Smith Business School), in consultation with farmer organizations, have convened under the EU Carbon+ Farming Coalition to understand the main farm-level barriers to the transition and develop adequate farmer-centric, practical and scalable solutions that support the transformation towards climate-smart agriculture. Based on the insights generated through a surveying 1.500+ farmers across 10 different crop-country combinations (CCC) (covering 7 countries and 6 cropping systems), the EU Carbon+ Farming Coalition (the Coalition) is committed to accelerate sustainability in farming by showcasing the feasibility and impact of potential solutions to identified farmer challenges. Work packages will specifically focus on key intervention areas: the enhancement of knowledge-sharing mechanisms for farmers, the optimization of interactions between farmers and other stakeholders in the value chain to promote sustainable farming operations, the identification of cost-effective MRV solutions to help build a reliable carbon market, the design of innovative risk sharing and management options to shield farms' economic viability in the transition, and the promotion of climate-smart practices in specific crop segments and Integrated Landscape Management solutions in vulnerable environments to capture the synergic effect created by combining all applicable transformative elements. The willingness of the Coalition's members to jointly design and execute this program of work demonstrates the transformative power of pre-competitive collaboration amongst private sector actors, civil society and farmers. The end goal of this collaborative effort is that outcomes inspire and guide stakeholders in other regions and countries to move into action to support this critical transition.

7. Feedback reference

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Nutrients – action plan for better management

EEB welcomes the initiative for an EU action plan for integrated nutrient management (INMAP). The war in Ukraine has highlighted the EU's dependency on imports of fertiliser and livestock feed, but even though our current food system is relying on limited raw materials and fossil gas, we are using these resources in a wasteful way with huge losses from field to plate. Only 20% of mined phosphorus ends up on the plate. For nitrogen this number is even lower. Globally, a third of produced food is lost or wasted, representing a quarter of the fertilizer used. In Europe, we need to drastically reduce nutrient losses to return to safe levels within the planetary boundaries. Nutrient pollution, from agriculture, industry and households, have dire consequences for the environment, including eutrophication, nitrate pollution of groundwater, greenhouse gas emissions and biodiversity loss. The cost of water pollution due to excess nitrogen and phosphorus is more than €22 billion per year, a cost that is largely not born by the polluters. The upcoming INMAP is an opportunity to take a holistic approach to nutrient losses from all these sources. The revision of the Urban Wastewater Treatment Directive offers an opportunity to decrease untreated wastewater discharges, put in place stricter nutrient emission limits and promote reuse of nutrients. Nature-based solutions can help reduce storm water overflows and for wastewater treatment in sparsely populated areas. However, recycling from waste streams must be accompanied by a reduction of input. Excessive protein consumption increases nitrogen load to wastewater treatment plants, while lower intake of protein-rich food can yield significant load reductions to receiving waters. When preparing the INMAP the European Commission should consider the work done by the Task Force on Reactive Nitrogen, and other Task Forces, under the Long-Range Transboundary Air Pollution Convention, including their recommendations on how to reduce NH3 emissions. The actions promoted by this plan should contribute to at least the achievement of the existing National Emission Ceilings Directive (NECD)' objectives for NH3 (in the EU the 94% of NH3 emissions originate from the agricultural sector) so to reduce the total amount and concentrations of nitrogen in the environment. In addition, the revision of the Ambient Air Quality Directives offers the opportunity to establish air quality standards for ammonia emissions: this action plan should already pave the way for coherent steps being taken on this. The INMAP should keep up the ambition of the Green Deal and its Zero Pollution Action Plan, Farm to Fork and Biodiversity Strategies that sets out to reduce nutrient losses by at least 50%, which will reduce the use of fertilisers by at least 20% by 2030. We need to move towards clear reductions in the use of fertilisers and towards circular

nutrients management. Food waste must rapidly be halved throughout the supply chain. Better nutrient management must be accompanied by a just and speedy transition away from industrial animal farming and towards extensive and mixed farming systems, and ‘less and better’ meat, dairy and egg consumption. Agroecology can offer guiding principles to improve the management and increase the efficiency of nutrient use in agricultural landscapes and transition away from high input agricultural systems. Urgent action is needed to tackle eutrophication and to address nutrient pollution at source. All EU institutions should fully embrace the zero-pollution ambition and remain committed to engage with decision-makers on the further development and roll out of the ZPAP, as well as helping mainstream – at EU and national levels - zero pollution ambition across policy, legislation and funding, and strengthen measures to minimise non-compliance. EEB is at the disposal of the Commission for any requests it may have and would be pleased to offer its expertise in the legislative proposal.

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Nutrients – action plan for better management

A coordinated, integrated nutrient management plan is a very welcome, overdue framework to align existing and future policies to improve the overall performance of the agricultural sector, while considering non-agriculture N and P sources and losses as well. In order to be as directionally reliable as possible, we want to highlight here some aspects that are in the current debate not fully appreciated but need to be at the core of the plan: Explicitly and quantitatively consider interrelationship with environmental impacts, foremost land use (occupation and transformation, both directly and indirectly), but also others. Avoid shortcuts and simplifications, for example do not require crop-unspecific fertiliser reduction targets (as relative losses differ hugely by crop). Ensure that yield reductions due to lower amount of applied N fertiliser are fully considered. E.g. organic agriculture has substantially lower yields (between -10 and -50%, especially high for mass products such as grains), among others caused by lower fertilisation levels. Such reduced yield has critical consequences: less harvest means that more natural ecosystems have to be converted to farmland, as the demand for agricultural products is as it is. These natural ecosystems to be lost would be mostly outside Europe, as conversion of European forests to agriculture is argued to see even stronger rejection from citizen than already. In other words: more organic agriculture in Europe leads to more deforestation in the tropics. A general push for organic agriculture would hence be wrong (noting that similar N losses can be achieved in conventional and organic agriculture). As to biodiversity: While it is surely good to have more biodiversity in organic farmland compared to conventional farmland, the extra species that occur are rarely threatened, while those lost in the converted forests are. Take a life cycle perspective of measures and effects, using the Commission's Product Environmental Footprint (PEF) approach, but also – for consequential analysis and indirect land use effects – the Commission's 2010 ILCD Handbook, General guidance. Recommendation: The explicit aim of the integrated nutrient management plan for agriculture should be to define and promote overall environmentally optimised farming systems (in life cycle perspective) that consider yield, N and P species emissions and related eutrophication impacts, impact of fertiliser production and management, land occupation and conversion (direct and indirect), biodiversity and ecosystem stability, as well as climate change and other impacts. Such new, sustainable farming systems should take the best from both conventional and organic

agriculture. Such would include synthetic and organic fertiliser in improved application schemes (i.e. not in autumn after harvest or too early before spring sowing, injecting manure and not spreading or putting on soil surface), some pesticides (while less substances and less amounts) and/or optimised biological pest control (possibly with some financial incentives), optimised other management measures - differentiated per crop, region and even site (e.g. erosion control, soil structure improvement). More research into biological pest control might be warranted, and finance or other incentives for extended manure storage at farms and for manure injection machines. The rest of the economy would contribute, particularly waste water treatment plants, that should recover more nutrients, sanitize the sludge and bring to agricultural land, while removing/preventing pollutants, particularly heavy metals to be spread to the land. maki Consulting GmbH is a small life cycle expert consulting firm of Dr.-Ing. Marc-Andree Wolf and Kirana (Chomkhamsri) Wolf. Marc and Kirana have over 20 years', respectively 15 years' working experience in LCA, PEF and related areas in government (both at the European Commission, Kirana also at Thai NSTDA), at consulting companies, and in research.

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Nutrients – action plan for better management

NITROGEN AND PHOSPHORUS, ESSENTIAL NUTRIENTS FOR PLANT GROWTH Nitrogen and phosphorus play a determining role in both the yields and the quality of cereal production. Breeders are also concerned about the quality and yield of fodder, including grass. FOR SUSTAINABLE OBJECTIVES French farmers would like to emphasize that any nutrient reduction objective must be set pragmatically, reconciling the protection of the environment and health and European food security, as well as the necessary contribution of the European Union to security. world food. Producing enough in Europe constitutes a strategic challenge for the European Union. Furthermore, the prices of mineral and organic fertilizers must remain sustainable for farmers. Finally, it is important to promote the production and use of organic fertilizers of animal origin. The nitrates directive's limitation of 170 kg/ha must be re-discussed. The conditions for organic fertilizers must, however, be accessible to family farms and not systematically impose criteria involving industrial processes. MINERAL FERTILIZERS, ESSENTIAL TO MEET THE DEMAND FOR FERTILIZERS IN FRANCE The MAFOR Prospectives study (2020) carried out under the aegis of the French Ministry of Agriculture demonstrates that the supply of fertilizers of organic origin does not cover all needs. Indeed, even by adopting a strategy of reducing the nitrogen requirement of plants or increased collection of industrial and urban effluents, the identified deposits are too weak to ensure the supply of nutrients necessary for the growth of crops. The specific nutrient requirements for organic farming must also be taken into account. PRACTICES HAVE EVOLVED AND SOLUTIONS TO REDUCE THE RISKS OF POLLUTION ARE DEVELOPING. THE EFFORTS MADE MUST BE TAKEN INTO ACCOUNT Mastering the agronomic management of nitrogen primarily aimed at preserving water resources. Research work and the significant supervision of the use of nitrogen by the action programs of the Nitrates Directive on 2/3 of the French national territory have contributed to significantly reducing nitrogen surpluses since 1990, allowing an improvement of water quality in areas historically affected by nitrate pollution. Grassy strips along watercourses, the splitting of inputs, soil cover, monitoring of needs in real time with satellite imagery or the installation of sensors have been developed. On dairy farms in the West, the nitrogen balance decreased by 35% between 1995 and 2010 and the use of mineral fertilizers by 50%. Since 1990, cereal yield has increased by 30% while nitrogen deliveries have decreased by 20%. The dynamics of the agricultural sector for the “air quality” issue are also engaged. This can be seen in the reductions in ammonia emissions (-2.3% between 2005 and 2019) and nitrous oxide (-9% between 1990 and 2018) (source Citepa). A guide to good agricultural practices has been developed and is distributed to farmers. Rapid burial, gradual or controlled release fertilizers, the use of urease inhibitors for urea or nitrogen solution, liming acidic soils or even drainage of hydromorphic soils are interesting techniques. Furthermore, for the production of mineral fertilizers, innovations are underway, including the production of hydrogen-based fertilizers. It will be important to continue to strengthen research and innovation so that the production of nutrients and their use are ever less sources of pollution and risks to human health.