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AGRICULTURE & INNOVATION

Improving nutrient recycling in agriculture

How to improve the agronomic use of recycled nutrients (N and P) from livestock manure and other organic sources?

Mineral nutrients are vital for producing the food on our plates, as well as for a wide variety of other products and materials which we use every day. Agricultural intensification using mineral fertilisers has allowed the world to sustain population growth and prosperity. However, the production of this type of fertiliser requires a lot of energy and the dependency on fossil resources needs to be re-thought. More attention must be paid to closing nutrient loops throughout the entire agro-food chain. The EIP-AGRI Focus Group (FG) on Nutrient recycling brought together 20 experts to gather practical and scientific knowledge to discuss how to improve nutrient recycling in agriculture and discuss how biobased fertilisers can be better taken up in the market.

The FG discussed the benefits and constraints of some emerging technologies that allow the recovery and re-use of nutrients on the farm. The list of existing treatment techniques is ever-expanding.

The FG identified farmers' acceptance and appreciation as one of the key issues to promote the wider use of recycled nutrients in practice. To increase the adoption of organic waste processing technologies and the production of new types of biobased fertilisers on a large scale, a real understanding of the fertiliser market and the end-user (e.g. arable farmers, fruit or vegetable producers, etc.) requirements is needed.

In addition to a concise overview of the most relevant legal frameworks at the EU level, the Focus Group identified possible policy measures for further discussion and debate, such as financial incentives, environmental taxation schemes, labelling obligations and possible incentives under the Common Agricultural Policy (CAP).

On-farm tools and practices were identified including for the assessment of the composition of fertilisers (e.g. N/P ratio), the release pattern of nitrogen from biobased fertilisers, the emission of ammonia, etc. Also the contribution of biobased fertilisers to the soil organic matter must not be ignored. The challenge is that nutrients contained within a biobased fertiliser have more complex dynamics, making their release more difficult to predict and plan than mineral fertilisers. The FG suggests to distinguish between 'organic soil improvers' and 'biobased fertilisers' based on the ratios EOM/mineral N and EOM/P₂O₅, (EOM= Effective Organic Matter)

"Promoting nutrient recycling is not only about technologies to produce biobased fertilisers, but also about practical tools to better understand the behaviour of nutrients and their management on the farm."

- Emilie Snauwaert (Belgium), expert from the EIP-AGRI Focus Group on nutrient recycling -

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Ideas for Operational Groups

- ▶ Demonstration of nutrient recycling technologies such as low ammonia (NH₃) emission techniques while involving the whole value chain to highlight the improvements in terms of sustainability
- ▶ Demonstration of how tailor-made biobased fertilisers match plant requirements
- ▶ Integration of nutrient management in certifying schemes to create transparency and trust
- ▶ Development or adaptation of cooperation business models to improve the production and marketing of tailor-made fertilisers
- ▶ Exchange of information and practices between farms on the use of biobased fertilisers, including nutrient and carbon behaviour in the soil

Research needs

- ▶ Develop and adopt specific LCA and environmental risk assessment methodologies for agricultural systems as the current methods were designed particularly for industrial processes
- ▶ Devise a standard way of assessing nutrient use efficiency of fertilising products, including meta-analysis of existing data and reports
- ▶ Focus on organic contaminants in some of the recovery pathways, like impacts of organic components on soil ecology and on food safety and how to improve the processing to treat these contaminants
- ▶ Better understand the perception and acceptance of recycled nutrients throughout the food production value chain through social sciences
- ▶ Use remote sensing tools and practices to get a better understanding and matching of fertilisation with crop requirements
- ▶ Explore practical tools that can be applied on-farm (farm-scale recovery, measurements, application equipment, etc.)
- ▶ Study the transition from raw bulk products containing nutrients in variable concentrations and ratios towards tailor-made fertilisers with desired and well-known formulated compositions

More ideas for Operational Groups and research needs available in the Focus Group report



More information

Focus Group webpage	Mini papers
Focus Group report	Inspirational ideas: <ul style="list-style-type: none">- Nutrient spill overs for valuable fertiliser (Italy)- Climate-friendly practices (Germany, Italy, Sweden)- From great soil comes great food - a farmers' story (France)- Biovakka, Manure management to produce biogas and nutrients (Finland)- Agro-industrial waste put to good use as biofertiliser (Italy)
Community Group 'Nutrient Recycling'	

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