SCALE UP
community-driven
bioeconomy development

WS1 Training Programme Protocol

Proceedings of the training sessions in WS1: Improved Nutrient Recycling in the Bioeconomy

Session #3
23 April 2024

INNOVATIVE APPLICATIONS OF BIO-BASED FERTILIZERS IN MODERN AGRICULTURE

The last training session of WS1 was held on April 23, 2024, explored innovative uses of bio-based fertilizers in farming. Experts like Jean-Philippe Bernard from the Chamber of Agriculture of Charente-Maritime and Deux-Sevres shared insights from European projects like Nurti2Cycle and Nutriman, focusing on their transition from national to European applications. Marc van Oers from Van Iperen International discussed the application of bio-residues in industrial fertilizer production, while Céline Marjolet from the Chamber of Agriculture of Pays de la Loire towards a regional supply chain for bio-based fertilizers produced from plant residues: technical and commercial feasibility study with the RUSTICA project. After fruitful discussions in smaller groups about regional challenges and needs, participants left feeling inspired to collaborate for a more sustainable farming future.

BREAK-OUT ROOMS

1. What is your experience with the application of bio-based fertilizers? What is the situation in your region?

INTERNATIONAL

Participants in the International room showed large experience in the application of bio-based fertilizers. In the countries that were present, mainly the Netherlands and France, bio-based fertilizers are used, but not to a large extent.

SPAIN

The Andalusian regional session was attended by two distinguished speakers, whose experience in the field of bio-fertilisers can be summarised as follows:

- The use of cyanobacteria as bio-fertiliser for sustainable production (e.g. agricultural soil restoration).
- The use of physiological bio-stimulants and their benefits.

The Andalusian region is a promising market for bio-fertilisers. For instance, experiments have been conducted with cyanobacteria in the Guadalquivir marshes, and several projects are currently in the scaling-up phase, with promising results in the laboratory.

NORTH MACEDONIA

In the Strumica region, there are several composting initiatives, primarily centred around reed composting. Schools engage in composting gardening leftovers, while many local farmers produce compost for their own use. Additionally, small businesses contribute to composting efforts by providing bio-waste, such as pepper processing remnants, to farmers for compost production. However, these activities are currently small-scale and dispersed throughout the region, lacking a cohesive sustainable market chain.

POLAND

During a discussion on the use of bio-based fertilisers in the Mazovia region, participants shared various experiences. Some mentioned successful implementation, especially in smaller-scale agriculture, where bio-based fertilisers have improved soil health and reduced environmental impact. However, others highlighted challenges such as limited awareness, availability, and infrastructure for bio-based fertilisers. In conclusion, there is potential for expansion, but further support and education are necessary to overcome the challenges.

SWEDEN

In both countries, Sweden and Finland, milk and meat farmers use manure for cultivation. Bio-based fertilizers are a local solution. Fewer mineral fertilizers are used, and this differs from the southern part of the countries.

In Sweden, there are new initiatives from the industrial sector waste from mining and battery manufacturing. In northern Sweden there is an example of a pelletized fertilizer produced from the digestate at a big farm biogas plant which is called an eco-labelled fertilizer.

In Sweden, sewage sludge is used for biogas production in many municipalities. How to use the digestate from both sewage sludge and anaerobic treated sewage sludge has gained a bigger interest recently. The nutrients from it are of high interest to utilize, while other substances like heavy metals and pharmaceuticals want to be avoided. Communication between the different actors to establish the market is important.

AUSTRIA

In Austria, the agricultural sector faces a notable gap in advocacy for circular nutrient management. Unlike certain regions where dedicated organizations champion sustainable farming practices, such representation is lacking here, presenting a significant challenge.

When it comes to finding solutions, it's essential to approach the issue with a mindset of continuity. Rather than upending established practices, new initiatives should complement existing frameworks, fostering a seamless transition that minimizes disruption.

However, a critical obstacle lies in the ambiguity surrounding viable business models. Without clear economic incentives, farmers may hesitate to adopt sustainable practices. It's imperative that stakeholders collaborate to develop robust, transparent business models that incentivize the integration of circular nutrient management practices.

2. What did you learn from the presentations?

INTERNATIONAL

Based on the presentations, the participants got acquainted that there are several routes to reaching the same goal. One is the RUSTICA-route with the design of completely new fertilisers and a radical change in supplying the fertilizers to the crops. The other one is the Van Iperen-

route with not changing current fertilizer practices but changing the origin of the components of the fertilizer.

The do's and don´ts in the Van Iperen presentation, was well recognized. It is not easy to find a good solution. Also, the critical questions raised by Jean Philippe Bernard: "are the costs sustainable?", "are there sufficient bio resources for substitution" and "can we change the habits of the farmers?", were well understood and do present a real challenge.

A lot of small and large actions will be required. Also mentioned was the combination of fertilization and irrigation. This should be taken into account when designing and supplicating new bio fertilizers.

SPAIN

The presentations at the general session were of particular interest to participants of the Andalusian regional session, with particular emphasis on the following:

- The N2C project and its objective of closing the nutrient loop, as well as the presentation of the results obtained. An interesting conclusion was reached regarding the necessity to change our current approach to fertilisation, in order to break with the seventy-year trend of using mineral fertilisers.
- The presentations by Van Iperen and the GreenSwitch project, which converts, for example, manure into sustainable nitrate fertilisers and reduces CO_2 emissions for greenhouse growers, were of particular interest.
- The Rustica project, which analyses the regional demands and opportunities of the different regions involved in the project, was also well received.

NORTH MACEDONIA

The presentations shared insights from European projects on making bio-based fertilizers. They stressed the need for a strong foundation in fertilizer production and moving from national to European approaches, as seen in projects like Nutri2Cycle and Nutriman. RUSTICA highlighted the importance of local supply chains, reducing transportation impact. The Chamber of Agriculture of Pays de la Loire emphasized the need for feasibility studies to tackle challenges early on. Van Iperen International discussed using bio-residues for fertilizer production, reducing waste. Overall, the presentations emphasized innovation and collaboration for sustainable agriculture.

POLAND

The attendees expressed their gratitude for the valuable information shared during the presentations in the main room. They found the case studies enlightening, especially regarding the technical and commercial aspects of producing bio-based fertilisers and managing the supply chain. The main insights gained from the event were the significance of regional cooperation, technological advancements, and market growth in promoting the adoption of bio-based fertilisers.

SWEDEN

The presentation from Van Iperen company made a good point with the do's and don´ts. The connection between urban and rural areas is important.

AUSTRIA

The overall trend seems promising, but there's still some uncertainty about whether it'll pay off in the end. One thing that stood out though was the speakers' positive attitude. They were all about looking on the bright side, which was a nice change from the usual focus on problems. But the participants also pointed out one major problem – the currently rather low prices. It's hard to make big changes when everyone's competing on price alone. Austria will need some extra incentives or maybe a little push from the government to really foster change. So, while things are looking up, there's still some practical stuff we need to figure out to make a real difference.

3. How can we improve the financial feasibility of bio-based fertilizers? What can the role of the regional platform be in this?

INTERNATIONAL

Bio fertilizers will be more costly. It will be hard to beat the synthetic fertilizers in price. But the route of maintaining synthetic fertilizers is not sustainable. Things just have to change, but keeping costs low, remains important. This can be done to have more regional recycling and to create logistic hubs with combinations of feed stocks for fertilizers and energy with sufficient scale. Change of legislation to allow use of digestate as source for nitrogen (RENURE), continues to be important. It is understood that actions in the good direction are now being taken by the EU.

SPAIN

The economic viability of organic fertilisers was a key topic of discussion at the regional session. The following points were highlighted:

- A spin-off related to circular bio-stimulants has been created.
- Some organic fertilisers require less complexity to produce than traditional mineral fertilisers. This is an economic advantage both for their production and for the rest of the value chain.

Regarding regional platforms, initiatives such as the one initiated by the SCALE-UP project in Andalusia, are vital for the advancement of new innovation strategies and the development of optimal logistical solutions for the production of bio-fertilisers. These collaborations between regional actors are essential to facilitate the growth of this sector.

NORTH MACEDONIA

The financial feasibility of bio-based fertilizers can be improved by integrating every step of the process, from production to distribution. This helps streamline operations and reduce costs. Additionally, efforts should be made to develop and expand markets for these fertilizers,

increasing demand and improving their financial viability. Supportive policies, such as subsidies and tax incentives, can be advocated for to promote the use of bio-based fertilizers. Continued research and innovation in fertilizer technology can lead to cost reductions and improved efficiency. Regional platforms can play a crucial role in coordinating these efforts and ensuring efficient value chain integration, supporting market development, advocating for supportive policies, and facilitating collaboration and knowledge sharing among stakeholders. In North Macedonia, where composting is prominent, regional platforms can focus on developing viable business models tailored to the local context.

POLAND

During the discussion on improving the financial feasibility of bio-based fertilisers, the participants emphasised the importance of regional platforms in facilitating collaboration and knowledge exchange among stakeholders. They explored potential strategies such as incentivising investments, subsidising research and development, and creating supportive policy frameworks to achieve this goal. Additionally, they highlighted the significance of promoting consumer awareness and market demand for bio-based fertilisers to enhance their economic viability.

SWEDEN

The sweet spot is a fertilizer that is cheaper but as good quality as the minerals. To achieve this, we need networks that can meet and discuss common problem solutions. An important point is the attitude towards products from sludge. We need to listen to the consumers. Certification for sludge biochar to fertilizer can be useful. Also, test the product and change it to be useful for the farmers. The attitude against that “waste” is for free must change. Logistic collecting of the biomass is making the products more expensive and this must be addressed. Information about initiatives was shared. The situation in Europe is not comparable to us up north, but we could state that we share the problems.

AUSTRIA

Austrian participants were interested in the cooperation with other stakeholders to increase flow of information, especially regarding the status quo of nutrient recycling. However, they were also looking forward to hearing more about the project and its outcomes and thought the regional platform could be a good source of communication.

Cross-regional conclusions/learnings

Designing new bio-based fertilizers that can be easily applied by farmers in the way they are used to, is not an easy task. This makes simple short-cuts for nutrient recycling, difficult. Production costs of bio-fertilizers are higher than costs of synthetic equivalents and can only be lowered to some extend by improving processes and logistics. Also, the way fertilizers are applied, will need to change. This was learnt from the experiences in three EU-projects: Nutri2Cycle, Nutriman and RUSTICA.

Possible solutions need to be found in:

- improvement of legislation and certification

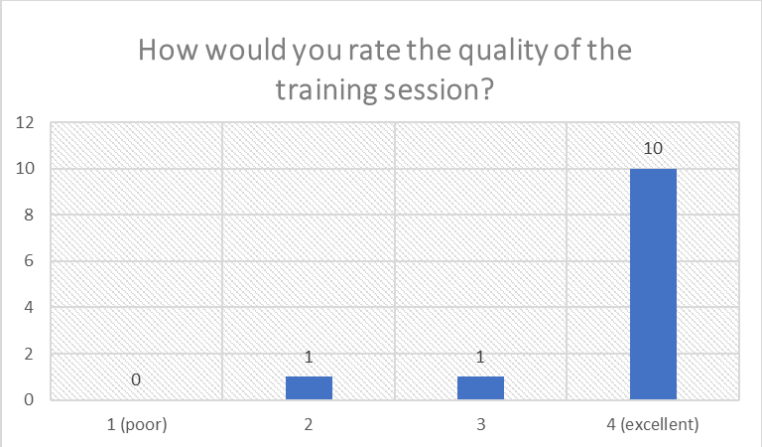
- development of various technology options in parallel with support of research and field tests establishment of logistical hubs for feed stocks and products with new networks between agro-industrial sectors and pilot plants
- higher income for farmers and other chain partners to cover costs of recycling.

Participant feedback

At the end of the training session, the participants were asked to fill in a short survey to evaluate the training session. In the end, 12 participants responded to the survey, of which 3 from Spain, 3 from Poland, 2 from Macedonia, 2 from Sweden, one from France and one from Austria. This gave the following results:

1.1 Quality

The participants were asked to rate the quality of the training session on a scale from 1 (poor) to 4 (excellent). 10 out of 12 participants answered this question with a 4, meaning they found the training session to be of excellent quality. There was one participant who answered this question with a 2 and one with a 3.



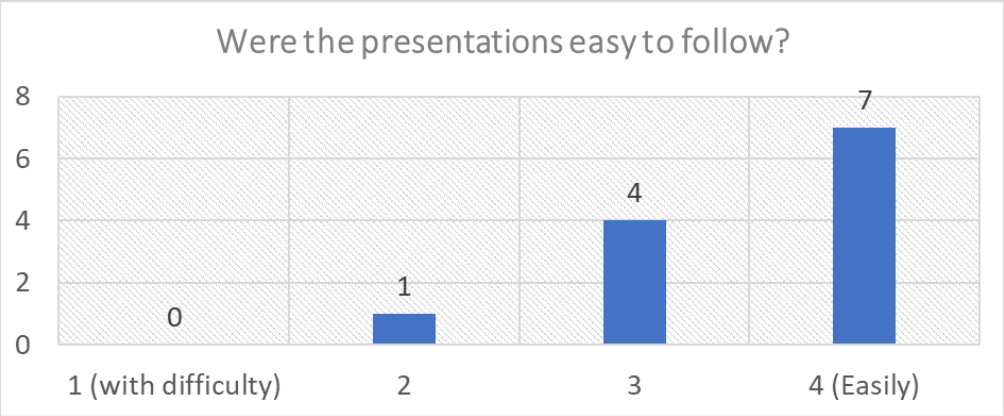
The participants were then asked what went well during the session. The participants complemented the moderation, the presentations, discussions, polls, structure and organization.

Next, the participants were asked what could have gone better. Participants mentioned that they would have liked more time for presentations, louder microphones for the speakers, and had issues with the translation to Spanish.

When asked how the third session compared to the first two, the participants mentioned that they found them to be consistently good.

1.2 Understandability

The participants were also asked whether the presentations were easy to follow. They were asked to rate this on a scale from 1(with difficulty) to 4 (easily). Out of the 12 responses, 7 gave a score of 4 (easily), 4 gave a 3, and 1 person gave it a 2. The respondent who responded with a 2, meaning they found it difficult to understand also mentioned having issues with the simultaneous translation.



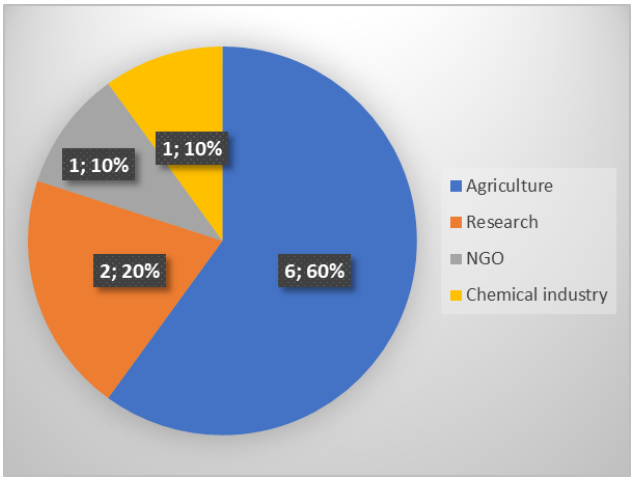
1.3 Topics

When asked which topic was most interesting, we received the following answers:

- All of them!
- Modern ways of waste management
- Rustica project
- Interesting for development and upgrading!
- The presentation from van Iperen
- Liquid fertilizers
- Biofertilizers

1.4 Field of occupation

The survey concluded with an optional question regarding the participant's field of occupation. The participants came from different areas: 6 from agriculture, 2 from research, 1 from the chemical industry, and one from an NGO.



Participants:

If you wish to get in touch with one of the participants from this session, please contact someone in the SCALE-UP consortium.

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