FERTIMANURE

Deliverable

Project Acronym: FERTIMANURE

Project full name: Innovative nutrient recovery from secondary sources – Production of high-added value Fertilizers' from animal MANURE

Grant Agreement No. 862849

D6.6. Policy proposals and guidelines for successful market uptake

Project start date	January 1st, 2020
Duration in months	54
Deliverable due date	June 30th, 2024
Actual submission date	June 30th, 2024
Work package concerned	6
Author(s) and Co-author(s)	Chris Poole (Author), Natalija Vugrin (Co-Author), Arturo Esclarín Ortiz (Co-Author) Rodrigo Arandi-Klee (author) and Karim Jouhari (co-author)
Contributor(s)	Fertilizers Europe/IPS Konzalting

Disclaimer: This deliverable a. Reflects only the author's view; and b. Exempts the Commission from any use that may be made of the information it contains.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

Preface

This report is a comprehensive examination of **Task 6.6 Industrial exploitation and replicability in EU** within the FERTIMANURE project, which focused on the industrial exploitation and replicability of bio-based fertilisers (BBFs) in the European Union. Our work, part of a larger effort aimed at enhancing sustainable agricultural practices through innovative fertiliser solutions, concentrated on ensuring that the data acquired during the project could support the industrial exploitation and replicability of BBFs.

Task 6.6 was carried out between Month 36 and Month 54, during which face-to-face interactions with various stakeholders were engaged, including BBF processors, end-users, and policymakers. These interactions were crucial in evaluating the interest and acceptability of new technologies and final products derived from BBFs. Additionally, proposals and guidelines to facilitate the successful market uptake of these products, addressing regulatory, financial, and technical aspects were prepared.

This deliverable integrates the insights gathered from stakeholder engagements and provides a strategic framework for the long-term exploitation of BBFs. The findings and recommendations presented here are intended to support policymakers, industry stakeholders, and the broader agricultural community in fostering the adoption of BBFs, thereby contributing to a more sustainable and resilient agricultural sector in Europe.

Fertilizer Europe, as a leader of this task wants to extend gratitude to all contributors of the workshops and roundtables, particularly IPS Konzalting for their patience, support, and advice, and Universität de Vic - Universität Central de Catalunya for their invaluable guidance throughout the project. This collaborative effort is dedicated to advancing the FERTIMANURE project's objectives and addressing the nutrient crisis in Europe through the strategic integration of BBFs.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

FERTIMANURE

Document History

Date	Author	Action	Status
February 5th, 2024	Chris Poole	1st draft revision	Draft
March 4th, 2024	Arturo Esclarìn Ortiz	2nd draft revision	Draft
April 4th, 2024	Natalija Vugrin	3rd draft revision	Draft
April 9th, 2024	Karim Jouhari	4th draft revision	Draft
April 17th, 2024	Karim Jouhari	5th draft revision	Draft
April 23rd, 2024	Karim Jouhari	6th Draft revision	Draft
April 24th, 2024	Karim Jouhari	7th Draft revision	Draft
May 14th, 2024	Karim Jouhari	8th Draft revision	Draft
May 15th, 2024	Karim Jouhari	9th Draft revision	Draft
May 17th, 2024	Karim Jouhari	10th Draft revision	Draft
May 22nd, 2024	Karim Jouhari	11th Draft revision	Draft
May 24th, 2024	Natalija Vugrin	12th Draft revision	Draft
June 26th, 2024	Laia Llenas	Approved by UVIC	Approved by PC

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

Summary

The FERTIMANURE project employed a comprehensive methodology and organizational approach to address the challenges and opportunities associated with promoting bio-based fertilisers (BBFs) for sustainable agriculture in Europe. Strategic planning and stakeholder engagement were pivotal in defining the action plan and ensuring the participation of relevant stakeholders. Brainstorming sessions allowed the project team to finalize the methodology and determine the best approach for obtaining robust results.

Findings from the FERTIMANURE project underscored the growing demand for BBFs in the agricultural sector, driven by sustainability concerns. However, the high cost of BBF products remains a significant barrier to widespread adoption among farmers. Regional variations in BBF accessibility and infrastructure were identified, highlighting the need for tailored strategies and investments to ensure equitable access across different agricultural contexts.

Guidelines for EU stakeholders were developed as a step-by-step approach to navigate the opportunities and barriers associated with BBFs. The guidelines emphasized the sustainability benefits of BBFs, including their utilization of organic waste and contribution to soil health and agricultural resilience. Regulatory considerations, technological improvements, and economic measures were outlined to promote BBF adoption and enhance market confidence.

Discussions during the project addressed key issues such as market demand, cost barriers, regional disparities, and policy challenges related to BBFs. Experts debated the role of subsidies in promoting BBF uptake and explored alternative policy tools to stimulate market growth. The importance of ensuring the safety, quality, and transparency of BBF products was emphasized, along with the need for collaborative efforts and inclusive decision-making processes involving stakeholders from various sectors.

In conclusion, the FERTIMANURE project generated actionable insights and recommendations to promote BBFs for sustainable agriculture in Europe. The action plan focused on addressing cost barriers, regional disparities, and policy challenges through innovative financing models, targeted subsidies, and localized strategies. Recommendations encompassed a range of measures, including public-private partnerships, research and innovation initiatives, infrastructure development, legislative reforms, awareness campaigns, and stakeholder engagement efforts. By implementing these recommendations, the project aimed to accelerate the adoption of BBFs and contribute to the long-term environmental and economic resilience of the agricultural sector in Europe.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

FERTIMANURE

Content

Preface 0
Document History 1
Summary 2
1. Introduction 6
2. Methodologies and Organisation 8
2.1. Purpose and design of stakeholder workshops – methodology 9
2.1.1. First event: Exploring Market Opportunities for Technologies and Products Developed within the Fertimanure project 10
2.1.2. Second event: ManuREsource 11
2.2. Workshops results and key insights 14
2.2.2. Second event: Roundtable at ManuREsource 17
3. The FERTIMANURE project findings and BBF market 21
3.1. Results and achievements - lessons learned from the project 21
4. Guidelines for EU stakeholders – step-by-step 23
4.1. Technical Guidelines 23
4.1.1. Opportunities and barriers 23
4.1.2. Best practices for implementation 24
4.2. Economic guidelines 27
4.2.1. Funding sources and mechanisms 27
4.3. Regulatory Guidelines 29
4.3.1. Key regulatory considerations 29
4.3.2. Compliance and certification 30
5. Discussion 31
6. Conclusions & action plan 33
7. Recommendations 34
Lessons Learnt 34
Recommendations 34
Brief project summary 38

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

List of Figures

Figure 1. Data provided by IPS to develop Task 6.6. 8
Figure 2. Visualisation of the workflow and methodology 9
Figure 3. Agenda of the workshop 10
Figure 4. Agenda for round table discussion 12
Figure 5. Roundtable 1: country of origin 12
Figure 6. Roundtable 1: background of the audience 13
Figure 7. Roundtable 2: country of origin 13
Figure 8. Roundtable 2: background of the audience 13
Figure 9. The first event – “Exploring market opportunities for technologies and products developed” 14
Figure 10. Result from Direct Pool *(question 2)* 15
Figure 11. Results from Direct Pool *(question 3)* 16
Figure 12. Result from Direct Pool *(question1)* 17
Figure 13. Roundtable with participants at ManuREsource 2024 18

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

List of Abbreviations

CAP	Common Agricultural Policy
EC	European Commission
BBF	Bio-based fertiliser
TMF	Tailor-made fertiliser
WP	Work Package

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

1. Introduction

In the landscape of European agriculture, sustainability has emerged as a significant concern, prompting stakeholders to reassess traditional practices and explore innovative solutions. One such solution under scrutiny is bio-based fertilisers (BBFs), viewed as a potential avenue for sustainable agricultural practices. As the European Union (EU) navigates the dual challenge of ensuring food security while mitigating environmental impacts, understanding the current state of fertiliser, subsidies, and agricultural practices is crucial for framing discussions around BBFs.

The Common Agricultural Policy (CAP) serves as a fundamental framework for agricultural governance in the EU, influencing policies and subsidies that shape farming practices across member states. Recent reforms, including the introduction of eco-schemes, underscore the EU's commitment to encouraging environmentally friendly agricultural practices, which may include the adoption of BBFs. While some member states have initiated subsidies for BBFs as part of their sustainability efforts, adoption levels vary, reflecting diverse agricultural landscapes and policy priorities across the EU.

Despite growing recognition of BBFs as a sustainable alternative, challenges persist, including regulatory complexities, market barriers, and technological limitations. The FERTIMANURE project aims to address these obstacles, offering evidence-based insights and policy recommendations. While BBFs offer benefits like nutrient efficiency and reduced pollution, their integration faces hurdles that require collaborative efforts and informed policymaking for a sustainable agricultural future.

As outlined in the Grant Agreement, **Task 6.6 Industrial exploitation and replicability in EU** focused on industrial exploitation and replicability from Month 36 to Month 54 of the project. The primary objective was to ensure that project-acquired data supported industrial exploitation and replicability, serving as a foundation for similar projects in different regions. This information was presented to various stakeholders, including policymakers and fertiliser sector representatives, during workshops. The workshops aimed to gather feedback on how the results could inform existing policies, promote BBFs accessibility and usage, followed by enhanced process scalability.

Through empirical research, stakeholder consultations, and rigorous analysis, the FERTIMANURE project aims to provide a nuanced understanding of BBFs, exploring their potential benefits and limitations. By leveraging scientific inquiry and stakeholder engagement, the project seeks to contribute to a more sustainable agricultural future in the EU, where BBFs may play a role in improving soil health, reducing nutrient pollution, and bolstering farming resilience.

In that sense, during the workshops organized, the results were presented to different audiences – these audiences ranged from policymakers to stakeholders within the fertilisers sector and agribusinesses.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

The main objective was to collect impressions and feedback on how the results obtained could benefit from policies in place, how policies could be modified to promote the accessibility and use of bio-based fertilisers (BBFs) and the scalability of the processes studied.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

2. Methodologies and Organisation

To shape the methodology of this study, Fertilizer Europe had extensive discussions with the Work Package 6 leader and analyzed crucial project documents, such as the market potential, business plan, and exploitation strategies. The reports on the market landscape analysis and end-user preferences in the EU states participating in the project were also reviewed. Additionally, an examination of the SWOT analysis, two business models (farms/fertilisers company), fertiliser development progress from WP3, and the inventory of stakeholder groups relevant to the BBFs market uptake were done. This collaborative effort provided a comprehensive understanding of tasks and challenges for promoting the market uptake of BBFs.

DATA FROM IPS:	
MARKET RESEARCH	✓ D1.2 - Report on the market landscape analysis and end-user preferences in the project participating EU states
INPUT FROM WP6	✓ D6.1 - Plan for Exploitation and Dissemination of Results ✓ D6.2 - Report with the IPR guidelines for project consortium ✓ D6.3 - Inventory of stakeholder groups relevant for BBFs and market uptake ✓ Two business models (farms/fertilisers companies) ✓ SWOT analysis
INPUT FROM OTHER WPs	✓ Information from specific work packages, such as WP3 (as fertilizer development progresses) or WP4 (experiments progress) WP7, etc.

Figure 1. Data provided by IPS to develop Task 6.6.

Building upon the knowledge gained from project documents and discussions with key stakeholders, the task leader crafted a methodology that prioritized strategic planning, stakeholder engagement, and targeted events. Initial meetings with the Work Package 6 leader provided an outline of the action plan and align approach with the project objectives. After extensive brainstorming sessions and deliberations, a consensus was reached on the methodology and approach to be adopted.

Central to the methodology was the engagement of key stakeholders, including industry representatives, academics, and policymakers. This open discussion format enabled the gathering of diverse perspectives and insights into the market dynamics and regulatory landscape surrounding BBFs. By tapping into the expertise of these stakeholders, the approach was refined to ensure that the study would yield robust results.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

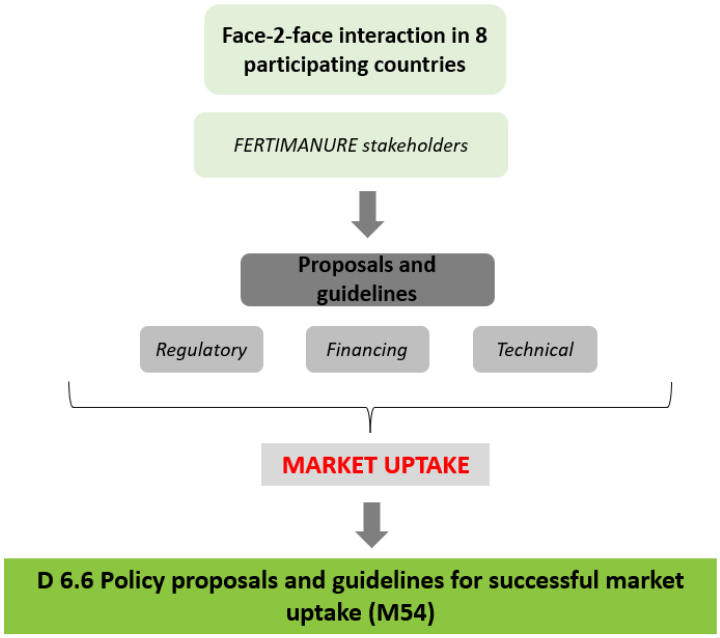

Figure 2. Visualisation of the workflow and methodology

Furthermore, the targeted events organized, such as the standalone workshop and the roundtable discussions held in conjunction with the ManuREsource 2024 conference, provided invaluable opportunities for knowledge exchange and networking. These events facilitated in-depth discussions on regulatory barriers, pricing strategies, subsidy frameworks, and the promotion of BBFs in the agricultural sector. The integration of these events into established conferences amplified the visibility of the project and extended its reach to a wider audience.

The findings from both events were synthesized and integrated into comprehensive reports. These reports encapsulated key insights, recommendations, and lessons learned, which formed the basis for subsequent decision-making, policy development, and project implementation.

Overall, the methodology was designed to be collaborative, inclusive, and results-driven, with a focus on leveraging the collective expertise of stakeholders to address the challenges and opportunities associated with promoting BBFs for sustainable agriculture in Europe.

2.1. Purpose and design of stakeholder workshops – methodology

To fulfil the task objectives, a series of meetings were held with the work package leaders. In these meetings, the action plan to obtain the best results was discussed and, eventually, decided. After all these brainstorming sessions, it was agreed to organize two different events. On the one hand, one independent event to gather information from different stakeholders from the countries – and neighboring countries – of the partners of the projects. On the other hand, one event within a bigger conference, **ManuREsource 2024**, to get feedback from other organisations and specialized stakeholders.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

2.1.1. First event: Exploring Market Opportunities for Technologies and Products Developed within the Fertimanure project

The 'Exploring Market Opportunities for Technologies and Products Developed within the Fertimanure Project' workshop was a significant milestone for the project. Originally planned as an in-person event in Brussels, the workshop aimed to facilitate participation from key stakeholders in the Northwest Europe region and beyond. The project members scheduled the workshop for June/July 2023, and it was later shifted to September to accommodate the agricultural sector's availability. However, due to scheduling conflicts with another event that many Fertimanure partners were attending, the workshop's date was further postponed to mid-November. This change led to a rethink of the event's format, and after careful consideration with project partners, it was decided to transition the event to an online format. This decision aimed to maintain the workshop's momentum, ensure continued engagement, and maximize accessibility to stakeholders from various regions across Europe. Additionally, the online format allowed for more flexibility in scheduling and eliminated travel barriers, ultimately enhancing inclusivity and reach.

The workshop was structured around two presentations, fostering interactive discussions and knowledge-sharing sessions. The presentations served as a foundation for participative sessions, focusing on key topics such as the regulatory barriers of BBFs and the pricing and future of subsidy schemes.

FERTIMANURE

WORKSHOP

„Exploring Market Opportunities for Technologies and Products Developed within the Fertimanure project"

Date: Tuesday, November 28th, 2023
Time: 9:00 am
Link for participation: Click here to join the meeting

Objective: The workshop aims to provide a platform for stakeholders to share their views on the market opportunities for technologies and products developed within the Fertimanure project. Your participation, insights into the challenges you've to overcome, the solutions you've devised, and the progress you've made are critical and will both inspire fellow experts and foster collaborative discussions that can shape the future of sustainable agriculture.

Agenda

PLENARY (35')

1. **Welcome** — Antoine Hoxha (5 min)
2. **Introduction of FERTIMANURE bio-based fertilisers (BBFs)** — Laia, Lienas Argelaguet (15 min)
3. **Business opportunities for novel BBFs** — Ana-Marija Špicnagel (15 min)

1st block REGULATORY BARRIERS (35')

What is the effect of the regulatory framework on the placing of BBFs on the market?
What are the obstacles when it comes to the regulatory aspect of BBFs?
How changes in a regulatory framework could boost the implementation of BBFs on the market?

COFFEE BREAK (10')

2nd block PRICING AND FUTURE OF SUBSIDY SCHEMES FOR BBFs (35')

Challenge to accomplish BBF price competitiveness in comparison to the competitors on the market?
How to overcome the gap between the price of BBFs and competitors' pricing?
How could subsidy schemes support and boost BBFs market entrance?

PLENARY (20')

1. Brief summary of the workshop and Q&A
2. Next steps

Figure 3. Agenda of the workshop

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

Throughout the sessions, participants provided valuable insights, sharing perspectives on BBFs' competitiveness, regulatory challenges, and the role of subsidies in supporting market entrance.

The workshop provided a unique opportunity for stakeholders to exchange views, share experiences, and identify collaboration opportunities. Discussions centered on the importance of stakeholder engagement, building trust in BBF products, and exploring innovative solutions to regulatory challenges. Insights from the workshop will inform future policy recommendations and initiatives, driving forward the adoption of sustainable agricultural practices and the use of BBFs.

Overall, the workshop was a success, fostering collaboration, knowledge exchange, and consensus-building among stakeholders. The positive energy and engagement demonstrated by participants underscored the collective commitment to advancing sustainable agriculture and driving innovation in the bio-based fertiliser sector. Moving forward, there is confidence that the insights gained from the workshop will serve as a catalyst for positive change and contribute to the success of the Fertimanure project.

2.1.2. Second event: ManuREsource

The ManuREsource event, held annually, serves as a premier platform for stakeholders in the bio-based fertilisers sector to converge, exchange insights, and address pertinent challenges and opportunities. This year's event took place from March 20th to 22nd in Antwerp, Belgium, and witnessed active participation from industry experts, policymakers, researchers, and practitioners, collectively contributing to enriching discussions and fostering collaboration within the BBF ecosystem.

ManuREsource, renowned for its commitment to advancing sustainable agricultural practices and promoting the circular economy, facilitated a series of roundtable discussions to delve into key themes shaping the BBF landscape. These roundtables provided a forum for stakeholders to explore regulatory barriers, pricing strategies, subsidy frameworks, and other critical aspects influencing BBF adoption and market viability.

Roundtable Overview

The roundtable sessions, comprising dynamic discussions and diverse perspectives, were structured to address specific themes and questions pertinent to the BBF domain. Each session aimed to foster dialogue, identify challenges, and propose actionable solutions to drive innovation and sustainability within the sector.

Participants engaged in robust exchanges, sharing insights, best practices, and practical experiences gleaned from their respective domains. The collaborative atmosphere fostered interdisciplinary dialogue and laid the groundwork for forging partnerships and advancing common objectives.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

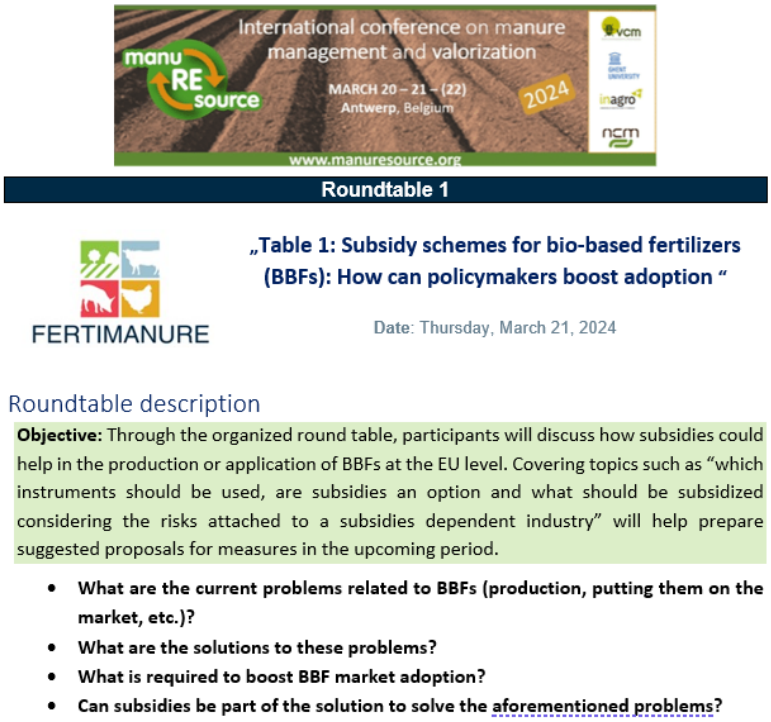

Figure 4. Agenda for round table discussion

Audience

As an introduction to the round tables, a short Mentimeter survey was prepared to learn more about the background of the participants and their views. In total of the two sessions, 16 stakeholders participated on the roundtable from varied origins. However, a majority of them originated from Northern Europe with a strong representation from Belgium, the Netherlands, and Scandinavia. Regarding their background, most participants were academics and researchers, with some policymakers and industry.

Figure 5. Roundtable 1: country of origin

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

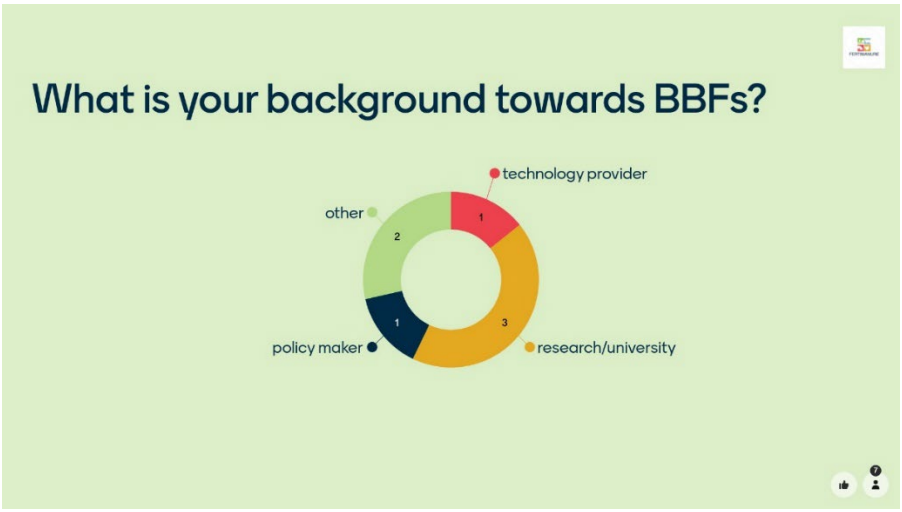

Figure 6. Roundtable 1: background of the audience

Figure 7. Roundtable 2: country of origin

Figure 8. Roundtable 2: background of the audience

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

2.2. Workshops results and key insights

2.2.1. First event: Exploring Market Opportunities for Technologies and Products Developed within the Fertimanure project

Session 1 - REGULATORY BARRIERS

Main questions shared with stakeholders:

I. What is the effect of the regulatory framework on the placing of BBFs on the market?
II. What are the obstacles of modifying the regulatory framework for BBFs?
III. How changes in a regulatory framework boost the implementation of BBFs on the market?

In this first session, participants emphasized the paramount importance of concise yet meaningful information sharing, particularly concerning regulatory issues and environmental aspects related to BBFs. The discussion delved into the intricacies of the regulatory landscape governing BBFs, highlighting the role of the RENURE criteria in shaping their usage. While these criteria restrict the classification of BBFs as mineral fertilisers, there are adaptations in place, especially regarding nitrogen content, indicating a dynamic regulatory environment. This nuanced understanding underscores the evolving nature of regulations surrounding BBFs, necessitating clear communication and continuous engagement with stakeholders.

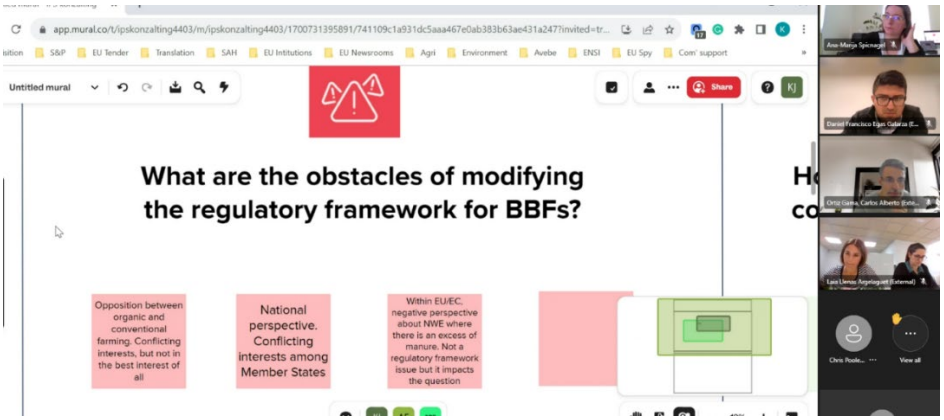

Figure 9. The first event – “Exploring market opportunities for technologies and products developed”

One of the key challenges identified is the lack of consistent guidelines for farmers, creating uncertainties around the utilization of BBFs. There was a focus on creating easily comprehensible materials, such as one-pagers, to communicate product quality, economic performance, and alignment with regulations to policymakers, farmers, and the fertiliser industry. This obstacle hinders the market placement of BBFs and underscores the need for clarity and coherence in regulatory frameworks.

Moreover, conflicting strategies between circular economy goals and organic farming practices at the EU level present significant challenges, particularly concerning the origin of manure and its sustainability aspects.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

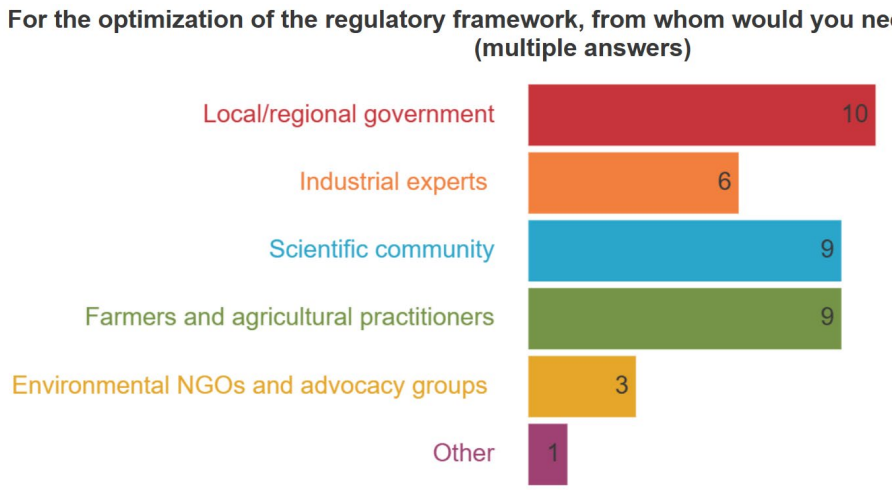

Figure 10. Result from Direct Pool *(question 2)*

Addressing these challenges requires a multifaceted approach. The idea of generating policy recommendations alongside public deliverables gains further significance when considering the complex regulatory landscape. Similarly, organizing face-to-face meetings becomes imperative for facilitating in-depth discussions on regulatory matters considering the conflicting strategies and evolving regulations.

Furthermore, several obstacles to modifying the regulatory framework for BBFs were highlighted, including opposition between organic and conventional farming, conflicting interests among Member States, and negative perspectives on regions with excess manure. These factors not only complicate the regulatory landscape but also pose significant hurdles to progress.

To overcome these challenges, stakeholders must collaborate closely and engage with regulatory stakeholders. By evaluating BBFs against organic principles and objectives and fostering clear communication of their benefits across all stakeholders, the path towards their acceptance and integration into existing regulatory frameworks becomes clearer. Collaboration at various scales, including national and regional levels, emerges as a crucial strategy for addressing regulatory challenges and promoting BBFs' market placement.

Break out session 2: PRICING AND FUTURE OF SUBSIDY SCHEMES FOR BBFs

Main questions shared with stakeholders:

I. On farm production vs regional production plant?
II. Subsidy based on biogas and the 'Renewable Energy Directive.
III. How to implement the subsidy? Technology, producers or end-users?
IV. How to address the price difference between mineral fertilisers and BBFs?
V. Users are willing to pay more if there is a clear regulatory framework and transparency of the product.
VI. Is there an opportunity to create a nitrogen certificate such as the carbon certificate, and would it help to reduce BBF price?
VII. Trust issues from farmers, they need to have the guarantee that BBFs work and are reliable.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

In the second workshop, one of the main challenges identified is the one faced by the agricultural industry and the scalability of the system on the farm. This scalability depends on critical decisions made at the EU level on whether to prioritize on-farm production or develop an industry network to process manure.

If the on-farm system is chosen, it will fit better with the circular economy strategy. The main advantage will be reduced production costs for farmers and the ability to reuse resources. On the other hand, there are important disparities in quality and quantity, and it might not be efficient for some farmers.

In the case of an industrial network, the question will be about how to make BBFs more competitive and how to develop the necessary infrastructure to process the manure. In this system, the manure transport will increase costs and limit the scalability of BBF production. The advantage of a central production plan is to have a more stable input of manure and output of BBFs, making it more reliable as a business model.

Another relevant aspect of BBFs is subsidies. How should they be implemented to increase the chances of success? BBFs could follow the model currently in place for biogas within the Renewable Energy Directive. The subsidy scheme would stimulate the use and production of BBFs – in some way, it would be labelled as 'renewable fertilisers'.

Participants also raised the question of whether it is the right time to provide a subsidy. BBFs could be part of the answer to addressing a series of crises the EU is facing, such as the environmental crisis (reducing the loss of nutrients), dependence on imports for primary resources (i.e., Russia, Morocco), and volatile fertiliser prices.

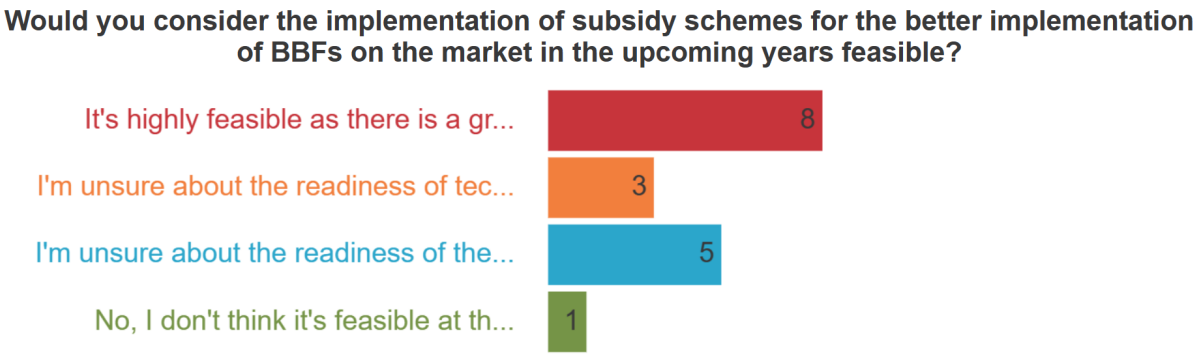

Figure 11. Results from Direct Pool *(question 3)*

However, which part of the supply chain should receive the subsidies? The technology providers, the producers, or the end-users? Considering that the technology is expensive, it should be a priority for the subsidy scheme.

Once the technology becomes more affordable, and the regulatory framework is adapted, farmers will be more likely to use it. But somehow, end-users should also receive a subsidy to stimulate their transition towards BBFs.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

The price and price difference between mineral fertilsers and BBFs are a bottleneck, at the moment. But it should not be perceived as something impossible to solve. For example, consumers accept paying a higher price for sustainable products if they have regulatory and labelling guarantees on the product. It will be the same for end-users. Once farmers have clarity on the regulatory framework and transparency, some will accept paying a higher price for BBFs.

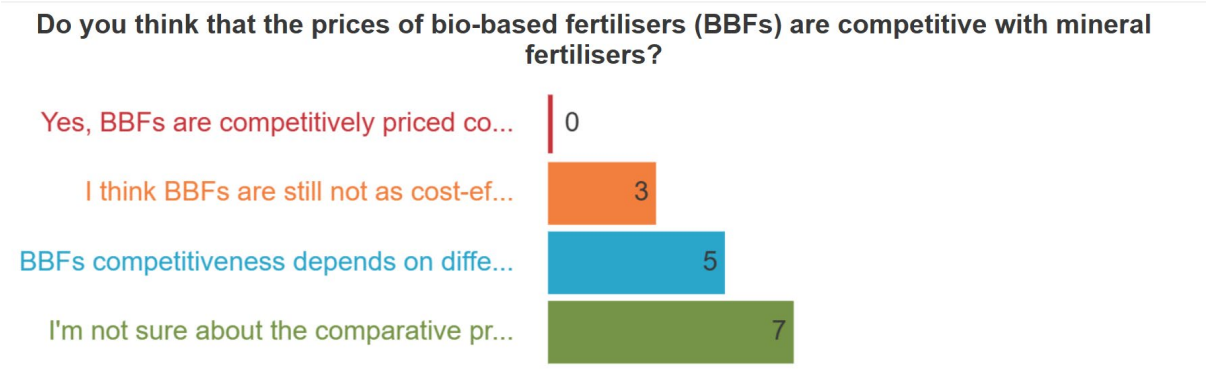

Figure 12. Result from Direct Pool *(question1)*

One solution that was discussed was to create certifications for end-users on savings on nitrogen submission, similar to carbon-type certificates. The subsidies could also be incorporated into existing schemes such as the CAP eco-schemes to compensate for the higher costs for BBFs.

In the end, what will be crucial for farmers is to know how effective BBFs are. Once they have the certainty that it works, they will be willing to consider them as an alternative to synthetic fertilisers. Farmers need stability and a guarantee that they will have a return on their investment.

Ultimately, on the question of subsidies and who should benefit from them, the questions should be addressed to economists. They will be able to determine where subsidies would be most effective.

2.2.2. Second event: Roundtable at ManuREsource

Roundtable – first session

Participants highlighted various challenges hindering the widespread adoption of BBFs. Ensuring BBFs are readily available in the market and providing tangible benefits to farmers emerged as a priority. Participants emphasized the need to address supply chain issues to improve access to BBFs for farmers. Concerns were raised about the high prices per nutrient of BBFs compared to conventional fertilisers. Participants discussed the need for transparent pricing mechanisms and standardization of nutrient content to enhance market confidence.

Participants called for clearer legislation to support organic farming practices and enable effective BBF use. They emphasized the importance of aligning regulatory frameworks with the principles of organic agriculture to facilitate BBF adoption in this sector.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

The potential of regenerative farming practices to promote soil health and sustainability was discussed. Participants highlighted the role of BBFs in regenerative agriculture and stressed the need for supportive policies and incentives to encourage their adoption.

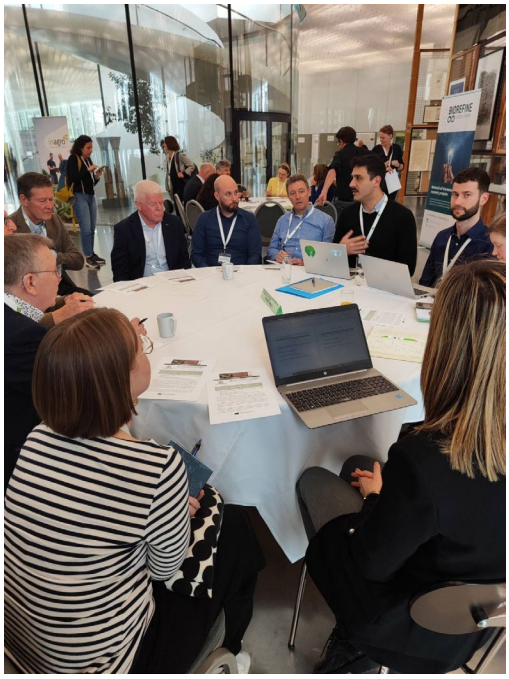

Figure 13. Roundtable with participants at ManuREsource 2024

Challenges related to BBF production processes and the adaptation of machinery to handle BBFs were identified. Participants emphasized the importance of investing in research and development to optimize BBF production and processing technologies.

It was emphasized that researchers should focus on highlighting the benefits of BBFs rather than directly asking for subsidies, leaving policymakers to decide based on demonstrated advantages. Policymaker incentives were encouraged to promote the use of BBFs, with suggestions such as requiring a certain percentage of organic fertilisers to be used. Highlighting the economic benefits for farmers was deemed crucial, as price remains a primary driver of adoption. Clear and user-friendly criteria for payment schemes should be laid out to reduce unnecessary complications and facilitate BBF adoption. National and regional approaches were favored over a one-size-fits-all EU-level strategy, recognizing the diverse contexts and needs across regions.

Participants also noted inconsistencies within the regulatory framework affecting market creation. Attention was drawn to the implications of regulatory constraints on organic farming and the potential obstacles caused by sourcing nutrients from intensive agriculture.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

The lack of consistent guidelines for farmers creates uncertainties around the use of BBFs, which hinders their market placement. Conflicting strategies between circular economy goals and organic farming practices at the EU level present challenges, particularly regarding the origin of manure and its sustainability aspects.

The roundtable discussions at the ManuREsource event provided a comprehensive exploration of key themes and challenges facing the BBF industry. Through robust dialogue, knowledge-sharing, and collaborative problem-solving, participants identified actionable strategies to address regulatory complexities, enhance market dynamics, and promote sustainable practices.

As the BBF sector continues to evolve, sustained collaboration, innovative policymaking, and stakeholder engagement will be crucial in driving progress and realizing the full potential of bio-based fertilisers. The ManuREsource event, with its commitment to fostering dialogue and collaboration, remains instrumental in advancing sustainability and circularity within the agricultural landscape.

Roundtable – second session

Participants highlighted the importance of making BBFs accessible to farmers and improving their image among consumers by emphasizing their positive impact on society. Nutrient content and high production costs were noted as issues, making BBFs less attractive to farmers compared to conventional fertilisers.

Participants called for clear legislation and certification standards to ensure BBF quality, reliability, and safety for both farmers and the environment. They discussed the need for a transition phase to BBFs, with incentives required to stimulate demand among farmers, necessitating several years of consistent use to establish market viability.

Participants emphasized the need to address market availability and perception. They highlighted the importance of creating a centralized platform or Market Hub for BBFs to improve accessibility and provide clear and transparent information to farmers. Local cooperation and farmer collaboration were highlighted as effective strategies for promoting BBFs in certain regions, along with the importance of creating trust through labels and quality assurance measures. The focus should be on developing short supply chains for BBFs.

Standardization and legislation were seen as key, with the proposal of standard quality requirements, small transport distances, and EU-level legislation on safe use and classification. Direct and indirect subsidies, along with marketing initiatives promoting biodiversity and sustainability, were discussed as ways policymakers could incentivize BBF adoption by requiring a minimum threshold of BBFs.

Participants also suggested promoting localized BBF production to reduce costs and environmental impact. They discussed the potential of decentralized production models to enhance supply chain resilience and support regional agricultural systems.

Trust and transparency were once again highlighted as crucial. Participants stressed the importance of certification schemes and labelling initiatives to build trust among consumers and stakeholders.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

They emphasized the need for clear labelling standards and third-party certification programs to verify the quality and origin of BBF products. Calls were made for the development of data sets and tools to help farmers access BBFs more easily, such as a centralized Market Hub for BBF products. Participants emphasized the importance of transparent information sharing and knowledge exchange to facilitate informed decision-making among farmers and agricultural stakeholders.

Overall, the roundtable emphasized the importance of addressing regulatory, economic, and perception-related barriers to BBF adoption while promoting sustainability and innovation in the agricultural sector.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

3. The FERTIMANURE project findings and BBF market

3.1. Results and achievements - lessons learned from the project

There is a significant demand for bio-based fertiliser products (BBFs) in the agricultural sector. However, the current market value of these products poses a significant barrier for farmers. To address this issue, there is a pressing need to enhance awareness and develop robust marketing strategies to bolster the reputation of BBFs and increase their adoption among farmers.

Discussions around the accessibility and infrastructure surrounding BBFs underscored the importance of considering regional dynamics.

While BBFs are readily accessible and suitable for regions with intensive or dense livestock sectors, a one-size-fits-all approach at the European level may not be suitable. Participants emphasized the necessity of focusing on local and regional strategies to ensure the efficient utilization of BBFs and their alignment with sustainability objectives. Concerns were raised regarding the viability of business models, particularly regarding the need for centralized or decentralized infrastructure adaptations.

Subsidies for BBFs elicited varied responses, with some participants strongly opposing the notion of scientists advocating for subsidies. They argued that such advocacy could potentially bias the viability of BBFs and distort markets in the future. However, participants agreed on the importance of presenting evidence on the benefits of BBFs to policymakers and engaging in discussions on whether subsidies should be considered. Additionally, discussions delved into determining the beneficiaries of subsidies, whether they should support producers through technology funding or farmers through product purchase support.

Linked to the subsidy discussions, the idea of leveraging different policy tools to boost BBF uptake in the market emerged. For instance, implementing an obligation for farmers to meet minimum thresholds of BBFs or organic matter usage could stimulate market demand while providing flexibility for farmers and the industry.

Participants also explored the potential creation of an EU Portal dedicated to disseminating information and promoting BBFs. Such a platform could play a pivotal role in spreading reliable information and enhancing transparency about BBF products in the market, thereby contributing to the establishment of uniform standards.

The importance of establishing quality assurance mechanisms and certification standards for BBFs was a recurring theme. Participants emphasized the need for trust-building measures, including certification schemes, to instill confidence among farmers and end-users regarding the effectiveness and safety of BBFs.

While the environmental benefits of BBFs were implied, highlighting these benefits explicitly could strengthen the case for BBFs as a sustainable alternative to synthetic fertilisers.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

Key points regarding reduced nutrient runoff, soil health improvement, and contributions to circular economy principles should be underscored to emphasize the broader sustainability implications of BBFs.

Discussions also underscored the significance of continued research and development efforts in advancing BBF technologies and addressing knowledge gaps. Emphasizing the need for ongoing innovation and investment in BBF research can highlight the long-term potential and evolution of BBFs as a viable agricultural solution.

Engaging a diverse range of stakeholders, including policymakers, farmers, industry stakeholders, and environmental organisations, was emphasized. Highlighting the importance of collaborative efforts and inclusive decision-making processes can reinforce the need for collective action and shared responsibility in driving BBF market uptake and advancing sustainable agriculture practices.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

4. Guidelines for EU stakeholders – step-by-step

4.1. Technical Guidelines

4.1.1. Opportunities and barriers

Strengths

Bio-based fertilisers (BBFs) are a sustainable alternative to traditional synthetic fertilisers, as they utilize organic and renewable sources of nutrients, such as organic waste or by-products from agriculture. By reducing dependency on finite mineral resources, BBFs offer a renewable source of nutrients, decreasing the reliance on imported fertilisers and raw materials. BBFs also contribute to soil health and fertility by promoting microbial activity, enhancing soil structure, and increasing organic matter content, leading to improved nutrient retention, water infiltration, and overall soil productivity. Furthermore, BBFs enhance Europe's agricultural resilience and security by mitigating geopolitical risks associated with fluctuations in global commodity markets and trade dependencies. BBF production can also be decentralized and tailored to local agricultural conditions, allowing for the utilization of regionally available organic resources, and fostering regional economic development and self-sufficiency among farmers. Compared to traditional fertilisers, BBFs typically have lower carbon footprints and environmental impacts throughout their lifecycle, including reduced greenhouse gas emissions, energy consumption, and nutrient runoff, aligning with European sustainability objectives and environmental regulations. BBFs offer flexibility in nutrient composition and application methods, allowing for customized formulations to meet specific crop and soil requirements, optimizing nutrient uptake efficiency and crop yields while minimizing environmental risks.

Weaknesses

Despite the benefits of BBFs, there is skepticism and mistrust among farmers regarding the efficacy, reliability, and consistency of BBF products. This stems from limited knowledge, experience, and awareness about BBF technologies and benefits. The absence of standardized certification schemes, quality assurance mechanisms, and transparent labelling for BBF products may also contribute to uncertainty and confusion among farmers and end-users, impeding informed decision-making and market confidence. Inadequate infrastructure for BBF production, distribution, and application, including storage facilities, transportation networks, and application equipment, may pose logistical challenges and increase costs, particularly in rural or underserved regions. Additionally, the upfront capital investment required for BBF production technologies and equipment, as well as the relatively higher cost of BBF products compared to conventional fertilisers, may act as barriers to adoption, especially for smallholder farmers or those with limited financial resources. Furthermore, BBF production often relies on locally available organic waste streams or by-products, which may be unevenly distributed across regions, leading to disparities in BBF availability and accessibility, particularly in areas with limited organic resource availability.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

Opportunities

Favorable government policies, subsidies, and financial incentives to promote BBF research, development, and adoption can stimulate market growth, encourage innovation, and overcome barriers related to cost, infrastructure, and trust. Increasing consumer awareness and demand for sustainably produced food and agricultural products present opportunities for BBFs to capitalize on market trends favoring environmentally friendly and ethically sourced inputs, driving market demand and premium pricing. Partnerships between stakeholders across the BBF value chain, including researchers, producers, policymakers, and farmers, can facilitate knowledge exchange, technology transfer, and best practices dissemination, accelerating market uptake and adoption. Ongoing research and development efforts to improve BBF production processes, enhance product efficacy, and reduce costs can lead to technological advancements and innovations that address existing weaknesses and overcome barriers to adoption. Integration of BBFs into circular economy initiatives and waste valorization strategies can create synergies between agricultural, environmental, and waste management sectors, unlocking new revenue streams, reducing waste, and promoting resource efficiency.

Threats

BBFs face competition from established synthetic fertiliser manufacturers and distributors, as well as alternative organic soil amendments, which may limit market share and penetration for BBF products, particularly in price-sensitive markets or sectors with entrenched practices. Evolving regulatory frameworks, standards, and certification requirements for BBFs may create uncertainty and compliance challenges for producers, distributors, and end-users, hindering market entry and investment in BBF technology.

4.1.2. Best practices for implementation

Strategy 1: Enhancing Traceability and Transparency

Objective: Improve traceability, transparency, and trust in bio-based fertilisers (BBFs) within the agricultural sector.

Regulatory Scope

- Advocate for standardized labeling requirements for BBFs, including information on nutrient composition, production processes, and environmental impact.
- Collaborate with regulatory bodies to establish clear guidelines for BBF production, ensuring compliance with safety and quality standards.
- Implement certification programs to verify the authenticity and quality of BBF products, enhancing consumer confidence and market acceptance.

Technological Scope

- Foster collaboration between research institutions, industry partners, and agricultural experts to develop and refine innovative processing technologies for BBF production, focusing on efficiency, scalability, and environmental sustainability.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

- Invest in research and development initiatives aimed at optimizing BBF production processes, enhancing nutrient recovery rates, and ensuring product consistency and quality.
- Encourage the adoption of digital tools and precision agriculture technologies to optimize nutrient management practices, minimize resource inputs, and maximize the agronomic value of BBFs for sustainable crop production.

Economic Scope

- Invest in the establishment of knowledge hubs and educational platforms focused on BBF production, application best practices, and environmental benefits, fostering awareness and knowledge sharing among agricultural stakeholders.
- Advocate for the implementation of public awareness campaigns and outreach initiatives to promote the benefits of BBFs for soil health, crop productivity, and environmental sustainability, targeting diverse audiences across rural and urban communities.

Strategy 2: Developing Non-Subsidy Financial Incentives

Objective: Stimulate the adoption of BBFs through alternative financial incentives beyond traditional subsidies.

Regulatory Scope

- Advocate for the implementation of tax incentives, such as tax credits or exemptions, for farmers and businesses that utilize BBFs, reducing the overall cost of adoption.
- Collaborate with policymakers to establish carbon pricing mechanisms that recognize the environmental benefits of BBFs, providing financial rewards for carbon sequestration and soil health improvements.

Technological Scope

- Invest in research and development initiatives focused on enhancing BBF production efficiency and reducing manufacturing costs, making BBFs more economically competitive with conventional fertilisers.
- Explore opportunities for cross-sector collaboration, such as partnerships with biotechnology companies and agricultural equipment manufacturers, to leverage technological advancements and drive innovation in BBF production and application.

Economic Scope

- Promote market-based mechanisms, such as carbon offset programs and certification schemes, which incentivize the adoption of BBFs by rewarding sustainable agricultural practices and soil carbon sequestration.
- Engage with private sector stakeholders, including retailers, food companies, and supply chain partners, to create demand-driven incentives for BBF adoption, aligning economic interests with environmental stewardship and sustainability goals.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

Strategy 3: Leveraging Subsidies for BBF Promotion

Objective: Harness national and European funding mechanisms to support the widespread adoption of BBFs.

Regulatory Scope

- Advocate for the allocation of subsidies from national and European agricultural policies to incentivize BBF production, distribution, and use, ensuring equitable access to financial support for farmers and businesses across the supply chain.
- Collaborate with policymakers to streamline subsidy application processes and reduce administrative burdens for BBF producers, facilitating greater participation and uptake.

Technological Scope

- Invest in research and development initiatives focused on developing cost-effective and scalable BBF production technologies, leveraging subsidies to drive innovation and efficiency improvements.
- Support pilot projects and demonstration initiatives to showcase the benefits of BBFs in diverse agricultural settings, providing practical insights and evidence to inform policy decisions and investment strategies.

Economic Scope

- Advocate for targeted subsidies that prioritize the transition to BBFs in sectors with the greatest potential for environmental impact and resource efficiency gains, such as intensive livestock farming and horticulture.
- Collaborate with financial institutions and agricultural cooperatives to design financing mechanisms that complement subsidy programs, providing additional capital and investment incentives for BBF adoption and expansion.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

4.2. Economic guidelines

4.2.1. Funding sources and mechanisms

The following are some proposed measures to encourage the research, development, and adoption of sustainable bio-based fertilisers (BBFs) in the European Union:

Subsidies to Technology Providers:

- Provide financial incentives or grants to technology providers involved in the research, development, and commercialization of BBF production technologies.
- Offer funding for pilot projects or demonstration facilities to showcase innovative BBF production methods and encourage adoption.
- Support technology transfer initiatives to facilitate the dissemination of BBF production technologies to different regions within the EU.
- Encourage collaboration between technology providers, research institutions, and industry stakeholders to accelerate innovation and improve technology readiness levels.

Subsidies to Farmers:

- Implement subsidy schemes to offset the initial investment costs associated with transitioning to BBF usage, including purchasing BBF products and adapting farming practices.
- Offer financial incentives for farmers who adopt sustainable agricultural practices that incorporate BBFs, such as regenerative agriculture or precision nutrient management Provide subsidies for on-farm infrastructure upgrades necessary for BBF application, storage, or handling, such as equipment modifications or storage facilities.
- Support training and capacity-building programs for farmers to enhance their knowledge and skills related to BBF usage, soil health management, and sustainable farming practices.

Tax Incentives to Use BBFs:

- Introduce tax credits or deductions for farmers who utilize BBFs as part of their nutrient management strategies, incentivizing the adoption of environmentally friendly practices.
- Implement preferential tax rates or exemptions for companies involved in the production, distribution, or sale of BBFs, fostering a favorable business environment for BBF market development.
- Consider tax incentives for research and development activities focused on BBF innovation, encouraging investment in technology development and product improvement.
- Explore tax rebates or incentives for consumers who purchase products grown using BBFs, promoting consumer awareness and demand for BBF-derived goods.

Research and Development Funding:

- Allocate public funding for research projects aimed at improving BBF technologies, increasing product efficacy, and addressing environmental concerns.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

- Establish collaborative research consortia involving academia, industry, and government agencies to pool resources and expertise in BBF research.
- Provide grants or subsidies to incentivize private sector investment in BBF-related research and development, fostering innovation and competitiveness.
- Support initiatives to enhance knowledge sharing and collaboration within the BBF research community, including conferences, workshops, and networking events.

Market-Based Incentives:

- Develop certification schemes or quality standards for BBFs to differentiate high-quality products and enhance consumer trust.
- Implement premium pricing mechanisms or market premiums for products derived from BBFs to reflect their environmental benefits and encourage adoption.
- Explore opportunities for carbon credits or environmental offsets linked to BBF usage, providing additional economic incentives for sustainable agriculture practices.
- Encourage public procurement policies that prioritize the use of BBFs in government-funded agricultural programs or projects, creating a market pull for BBF products.

Infrastructure Investment:

- Invest in infrastructure development projects to support the production, processing, and distribution of BBFs, including manufacturing facilities, storage infrastructure, and transportation networks.
- Provide grants or low-interest loans to support the establishment of BBF production facilities, particularly in underserved or rural areas where infrastructure is lacking.
- Facilitate public-private partnerships to leverage private sector investment in BBF infrastructure projects and promote industry collaboration.
- Support the development of technology hubs or innovation clusters focused on BBF production and processing, fostering knowledge exchange and industry growth.

Capacity Building and Training:

- Establish training programs and workshops to educate farmers, agronomists, and agricultural extension agents about the benefits and best practices of BBF usage.
- Provide technical assistance and advisory services to support farmers in implementing BBF-based nutrient management strategies and optimizing crop production.
- Foster collaboration between agricultural research institutions, extension services, and farmer cooperatives to disseminate information and share expertise on BBF adoption.
- Develop online resources, educational materials, and extension publications to reach a broader audience and provide accessible information on BBF technologies and practices.

Market Access Support:

- Foster partnerships with industry stakeholders and market intermediaries to develop value chains and distribution networks for BBF products.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

4.3. Regulatory Guidelines

4.3.1. Key regulatory considerations

The following are key considerations when producing, labelling, marketing, and using fertilisers, particularly bio-based fertiliser (BBF) products, in compliance with European Union (EU) regulations and national legislations.

Firstly, it is critical to understand and comply with the existing EU regulations and national legislations governing the aforementioned activities, including the EU Fertilising Products Regulation (EU 2019/1009). This regulation sets harmonized rules for placing fertilising products on the EU market.

Secondly, it is essential to ensure that BBF products meet the regulatory definition of fertilising products as stipulated by the EU Fertilising Products Regulation. As defined by the regulation, BBF products encompass substances, mixtures, or microorganisms containing nutrients intended to improve plant nutrition or soil fertility.

Thirdly, implementing quality assurance systems and standards is crucial to ensuring the safety, efficacy, and consistency of BBF products. Adherence to Good Manufacturing Practices (GMP), quality control procedures, and product testing for nutrient content, contaminants, and stability are among the measures that should be taken.

Fourthly, seeking certification from recognized third-party certification bodies or conformity assessment bodies accredited by national authorities is advisable to validate compliance with regulatory requirements and quality standards. Notable examples include ISO 9001 (Quality Management Systems) and ISO 14001 (Environmental Management Systems).

Fifthly, clear, and accurate labelling on BBF products is essential. This should include the product name, nutrient content, application rates, usage instructions, safety precautions, and environmental impact information. All labelling should be in accordance with EU labelling regulations and guidelines.

Sixthly, conducting environmental risk assessments is important to evaluate the potential environmental impacts of BBF products. This includes assessing nutrient leaching, soil contamination, and ecosystem effects. Mitigation measures should be implemented to minimize adverse effects and ensure environmental sustainability.

Lastly, maintaining comprehensive records of BBF production processes, ingredient sourcing, quality control measures, and distribution channels is necessary for traceability, transparency, and regulatory compliance. This documentation should include product formulations, batch records, and safety data sheets.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

4.3.2. Compliance and certification

It is advisable to obtain organic certification according to the EU Organic Farming Regulation (EU 2018/848) for BBF products sourced from organic materials. This certification attests to compliance with organic production standards and requirements, ensuring credibility and access to the organic farming sector. In addition, pursuing EU Ecolabel certification for BBF products is recommended as it highlights environmental performance, resource efficiency, and sustainable production practices. Such certification meets stringent requirements to minimize environmental impact, conserve biodiversity, and uphold circular economy principles.

Moreover, obtaining ISO certification for BBF manufacturing facilities and processes, including ISO 22000 (Food Safety Management Systems) and ISO 45001 (Occupational Health and Safety Management Systems), can enhance credibility, competitiveness, and compliance with international standards. It is equally crucial to conduct regular compliance audits and inspections of BBF facilities, operations, and products by competent authorities, regulatory agencies, or independent auditors to verify compliance with regulatory requirements, identify non-conformities, and implement corrective actions.

Furthermore, it is recommended to engage with relevant stakeholders, including government agencies, industry associations, farmers, and environmental organisations, to stay abreast of regulatory developments, share best practices, and address emerging issues related to BBF regulation, compliance, and certification. This approach will ensure that businesses remain informed and proactive in meeting the ever-evolving regulatory landscape.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

5. Discussion

Market Demand and Cost Barriers

The agricultural industry is increasingly recognizing the benefits of bio-based fertilisers (BBFs), as sustainability and environmental concerns become more prominent. Despite this demand, the high cost of BBF products remains a significant barrier to their widespread adoption. This cost factor is particularly inhibiting for farmers with limited financial resources, who see BBFs as a potential alternative to conventional fertilisers. Addressing these cost barriers requires cost-effective strategies, including improving production efficiency, optimizing distribution channels, and implementing targeted marketing campaigns to enhance the affordability and accessibility of BBF products.

Regional Variations and Infrastructure Challenges

There are regional inconsistencies in the accessibility and infrastructure for BBFs across Europe. While BBFs are more readily available and usable in regions with intensive livestock sectors, challenges exist in areas with limited infrastructure or less dense agricultural activity. To address these regional disparities, tailored strategies and investments are needed to ensure equitable access to BBFs across different agricultural contexts. This may involve targeted infrastructure development, localized marketing initiatives, and region-specific policy interventions to support BBF uptake.

Localized Approaches and Policy Tools

Localized approaches and policy tools are critical to promoting BBF uptake. Effective policy instruments discussed include mandating minimum BBF usage thresholds, introducing tax incentives or subsidies, and implementing market obligations to stimulate demand and facilitate market growth. These measures aim to align with local agricultural practices and preferences while incentivizing BBF adoption.

Subsidies and Market Distortion

While subsidies can incentivize uptake, concerns were raised about potential market distortions and long-term sustainability if BBF markets become overly reliant on subsidies. Participants stressed the importance of balanced approaches that combine subsidies with measures to improve efficiency, reduce costs, and ensure market competitiveness. This includes fostering innovation, enhancing productivity, and promoting sustainable business models in the BBF sector.

Certification and Transparency

Ensuring the safety, quality, and transparency of BBF products emerged as critical concerns among participants. Robust certification schemes, transparent labelling, and comprehensive quality assurance mechanisms are essential to build trust among farmers and end-users. Establishing clear certification standards, implementing third-party verification processes, and developing traceability systems are key measures to enhance product reliability and consumer confidence in BBFs.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

Policy Recommendations

The discussions generated a comprehensive set of policy recommendations aimed at addressing the identified challenges and promoting BBF market uptake in Europe. These recommendations include exploring alternative funding schemes, enhancing research and innovation efforts, developing infrastructure, reinforcing the legislative framework, improving awareness and trust in BBF products, and implementing safety measures and certification standards to ensure product integrity and compliance with regulatory requirements.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

6. Conclusions & action plan

The significance of sustainability in agriculture has gained recognition among farmers, policymakers, and stakeholders. Bio-based fertilisers (BBFs) are being increasingly considered as a viable solution to address environmental concerns and promote sustainable farming practices.

However, the high cost of BBF products remains a significant deterrent to widespread adoption. To expedite BBF uptake, it is essential to address cost barriers through innovative financing models, subsidies, and cost-effective strategies.

Additionally, there are regional variations in the accessibility and infrastructure for BBFs across Europe. Tailored strategies and investments are required to ensure equitable access to BBFs and overcome infrastructure challenges in different agricultural contexts.

Localized approaches and policy tools are fundamental for promoting BBF uptake, taking into account regional agricultural practices, preferences, and infrastructure. Effective policy instruments to stimulate demand include mandating minimum usage thresholds, introducing tax incentives, and implementing market obligations.

While subsidies can inspire BBF adoption, concerns about potential market distortions and long-term sustainability have been raised. Balanced subsidy policies, combined with measures to improve efficiency, reduce costs, and foster innovation, are necessary to ensure market competitiveness and sustainability.

Ensuring safety, quality, and transparency of BBF products is critical to establishing trust among farmers and end-users. Robust certification schemes, transparent labelling, and comprehensive quality assurance mechanisms are vital to enhance product reliability and consumer confidence in BBFs.

Addressing the challenges and opportunities related to BBF uptake requires collaborative efforts and inclusive decision-making processes involving farmers, policymakers, industry stakeholders, and environmental organisations. Stakeholder engagement, knowledge exchange, and participatory approaches are essential to develop effective strategies and policies.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

7. Recommendations

Lessons Learnt

The rising awareness of sustainability and environmental concerns has led to a genuine demand for bio-based fertilisers (BBFs) among European farmers. However, the high cost of BBF products remains a significant obstacle to their widespread adoption. Experts in this area emphasize the need to address cost barriers by enhancing efficiency in production, distribution, and marketing strategies.

Accessibility and infrastructure are key determinants in the promotion of BBFs. While BBFs may be easily accessible in regions with intensive livestock sectors, significant challenges exist in regions with limited infrastructure or less dense agricultural activity. Experts stress the need for tailored strategies and investments to ensure equitable access to BBFs across different regions.

Experts also underscore the importance of localized strategies over European-level initiatives for BBF promotion and adoption. While EU-wide policies and regulations provide a framework, local and regional approaches are deemed more effective in addressing specific agricultural contexts, preferences, and challenges. This includes customizing marketing efforts, subsidy schemes, and infrastructure development to suit the needs of local farmers and communities.

The role of subsidies in promoting BBF uptake has sparked debate among experts. While subsidies can incentivize adoption, concerns have been raised about potential market distortions and the long-term viability of BBF products if heavily reliant on subsidies. Experts emphasize the need for balanced approaches, where subsidies are complemented by measures to improve efficiency, reduce costs, and foster market competition.

Experts have explored alternative policy tools beyond subsidies to stimulate BBF market growth. These tools include mandating minimum thresholds of BBF or organic matter usage for farmers, creating market obligations, and exploring tax incentives or preferential procurement schemes to incentivize BBF adoption. These policy measures aim to create demand for BBFs while providing flexibility for farmers and industry stakeholders.

Experts also acknowledge the potential benefits of establishing an EU-wide information portal for BBFs to enhance transparency, disseminate trusted information, and promote standardized practices. Such a portal could serve as a centralized platform for farmers, policymakers, and other stakeholders to access information on BBF products, certification standards, best practices, and regulatory updates. Explore Alternative Funding.

Recommendations

Schemes, Besides Subsidies:

- Encourage public-private partnerships to invest in BBF research, development, and infrastructure projects.
- Establish venture capital funds or innovation grants specifically dedicated to supporting BBF startups and SMEs.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

- Foster collaboration between research institutions, industry stakeholders, and financial institutions to develop innovative financing models tailored to the needs of the BBF sector, such as green bonds, impact investing, or crowdfunding campaigns.

Enhance Research and Innovation:

- Allocate additional funding for BBF research and innovation projects under Horizon Europe or other EU research and innovation programs.
- Establish research clusters or consortia focused on BBF technologies, bringing together multidisciplinary expertise from academia, industry, and government agencies to drive innovation and knowledge exchange.
- Support cross-border collaboration and knowledge-sharing initiatives to accelerate the development and adoption of advanced BBF technologies.

Develop Infrastructure:

- Invest in the development of BBF production facilities, distribution networks, and storage infrastructure to improve accessibility and availability of BBF products across the EU.
- Provide financial incentives or tax breaks for the retrofitting or construction of BBF manufacturing plants, bioconversion facilities, and waste-to-resource conversion technologies.
- Facilitate public-private partnerships to upgrade existing agricultural infrastructure, such as anaerobic digesters, composting facilities, and bioenergy plants, to support the sustainable production and utilization of BBFs.

Reinforce Legislative Framework to Facilitate the Demand for BBFs:

- Advocate for policy reforms and regulatory adjustments to promote the uptake of BBFs, such as streamlining approval processes, harmonizing labelling requirements, and establishing minimum procurement standards for public sector procurement.
- Introduce targeted incentives or tax incentives to encourage farmers to adopt BBFs, such as tax credits for BBF purchases, subsidies for organic farming practices that incorporate BBFs, or preferential treatment in agri-environmental schemes.
- Collaborate with industry associations, environmental NGOs, and consumer advocacy groups to develop voluntary certification schemes or eco-labelling programs for BBF products, enhancing transparency, credibility, and consumer confidence in BBFs.

Reinforce Awareness and Trust in the Products:

- Launch public awareness campaigns and educational initiatives to inform farmers, agronomists, policymakers, and consumers about the benefits of BBFs for soil health, crop productivity, and environmental sustainability.
- Foster knowledge exchange platforms, demonstration farms, and field trials to showcase successful BBF applications, share best practices, and address misconceptions or concerns about BBF efficacy, safety, and reliability.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

- Promote stakeholder engagement and participatory decision-making processes to ensure that BBF policies and initiatives reflect the needs, priorities, and perspectives of diverse stakeholders, including farmers, rural communities, environmental groups, and industry stakeholders.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

FERTIMANURE

FERTIMANURE

INNOVATIVE NUTRIENT RECOVERY FROM SECONDARY SOURCES-PRODUCTION OF HIGH-ADDED VALUE FERTILISERS FROM ANIMAL MANURE

PROJECT COORDINATOR

Fundació Universitària Balmes (Spain)

CONSORTIUM

Ghent University (Belgium)
Wageningen Environmental Research (The Netherlands)
University of Milan (Italy)
Leitat (Spain)
GreenWin (Belgium)
European Landowners Organisation (Belgium)
IPS Konzalting (Croatia)
Fraunhofer (Germany)
Dorset Green Machines (The Netherlands)
Prinsen Dairy Company (The Netherlands)
French Chamber of Agriculture (France)
Cooperativa Plana de Vic (Spain)
AlgaEnergy S.A. (Spain)
Fertinagro Biotech (Spain)
RITTMO Agroenvironnement (France)
Agrifutur (Italy)
Departament d'Agricultura, Ramaderia, Pesca I Alimentació (Spain)
Fertilizers Europe (Belgium)
Instituto Nacional de Tecnología Agropecuaria (Argentina)

PROJECT WEBSITE:

https://www.fertimanure.eu

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

Brief project summary

The mission of the FERTIMANURE project is to provide innovative solutions (technology, end-products, and business models) that solve real issues, i.e. the manure challenge, and help farmers with the challenges that they are currently facing. FERTIMANURE will develop, integrate, test and validate innovative nutrient management strategies so as to efficiently recover and reuse nutrients and other products with agronomic value from manure, to ultimately obtain reliable and safe fertilisers that can compete in the EU fertiliser market. The FERTIMANURE project will cover both technological and nutrient management approaches. The technological side will be addressed with the implementation of 5 innovative and integrated on-farm experimental pilots for nutrient recovery in the most relevant European countries in terms of livestock production (Spain, France, Germany, Belgium, The Netherlands), whereas nutrient management will be addressed through 3 different strategies adapted to mixed and specialised farming systems:
Strategy #1 with on-farm production and use of bio-based fertilisers (BBF)(1) , **Strategy #2** with on-farm BBF production and centralised tailor-made fertilisers (TMF)(2) production, and **Strategy #3** with on-farm TMF production and use.

Definition of Bio-based fertilisers (BBFs): *Bio-based fertilisers (BBFs) are fertilising products or a component to be used in the production of (Tailor-Made) Fertilisers that are derived* ***from biomass-related resources.***

The BBFs of FERTIMANURE are "obtained through a ***physical, thermal/thermo-chemical, chemical, and/or biological processes for the treatment*** *of manure or digestate that result into a change in composition due to a change in concentration of nutrients and their ratios compared to the input material(s) in order to get better marketable products providing farmers with nutrients of sufficient quality".*

However, just separation of manure in a solid and liquid fraction (as first processing step) is excluded. These products are not conceived as a BBF, although they are valuable sources to supply nutrients on agricultural land.

LIST OF BBFs Produced in FERTIMANURE

Number	BBF-code	BBF product description
1	NL-AS	Ammonium sulphate solution
2	NL-LK	Liquid K-fertiliser
3	NL-SC	Soil conditioner
4	NL-WP	Wet organic P-rich fertiliser
5	NL-DP	*90% dried organic P rich fertiliser (calc)*
6	ES-NC	Nutrient-rich concentrate
7	ES-DSC	Bio-dried solid fraction
8	ES-PA	Phosphorous (ashes)
9	ES-AM	Ammonium salts
10	ES-AA	AA-based biostimulants
11	DE-BC	Biochar (solid)
12	DE-AP	Ammonium phosphate on perlite (solid)
13	BE-AN	Ammonium nitrate
14	BE-AS	Ammonium sulphate
15	BE-AW	Ammonium water
16	FR-BC	Biochar
17	FR-AS	Ammonium sulphate
18	FR-LK	Liquid K-fertiliser

Definition of Tailor-Made Fertilisers (TMFs): *A tailor-made fertiliser (TMF) is a customized fertiliser that meets with the nutrient requirements of a specific crop by taking into account the soil type, soil fertility status, and growing conditions and fertilisation practises.*

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849

The TMFs obtained in FERTIMANURE are produced from BBFs (produced from manure or digestate and/or other recovered fertilising products that are available) and/or mineral fertilisers (MF) (and/or biostimulants).

Fully crop specific TMFs can be defined and centrally produced assuming e.g. a sufficient nutrient status of a soil type and no additional fertilisation practice.

However, on farm level the soil-crop requirements will be different due to another nutrient status of the soil and the fact that often manure/digestate will be applied on the fields which has to be taken into account as nutrient supplier. Consequently, the composition of the TMF (combination of BBF and MF) that will be used by the farmer can differ from the one produced in a centralised way.

This project has received funding from
the EU Horizon 2020 Research and Innovation Programme
under grant agreement No. 862849