D3.4. Preliminary outcomes from the co-creation processes

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement N° 101060426.

Deliverable Information Sheet

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Project Acronym	FER-PLAY
Project Title	Multi-assessment of circular FERtilisers for Promoting Local sustainable value chains And clean ecosYstems
Project Call	HORIZON-CL6-2021-ZEROPOLLUTION-01
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Deliverable Title	Preliminary outcomes from the co-creation processes
Deliverable Type	R – Document, report
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Author	CIC
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Reviewers	CETENMA, INAGRO, EBA
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Observations	Events signing list can be made available to the EC upon request

List of Acronyms

CSA	Community-supported agriculture
PAS	Programmatische Aanpak Stikstof
RDF	Recycled Derived Fertilisers

List of Tables

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Keywords list

- Circular fertilisers
- Resource efficiency
- Circular fertilisers value chains
- Agriculture, life cycle assessment
- Sewage sludge
- Bio-waste
- Organic by-products
- Wastewater

Disclaimer

Table of Contents

Executive summary

FER-PLAY is working to protect ecosystems, decrease EU dependence on fertiliser imports, and improve resource efficiency through the promotion of circular fertilisers. The project maps and assesses circular fertilisers made from secondary raw materials and highlight their multiple benefits to foster their wide-scale production and application.

The project work plan foresees a dedicated Work Package to gather first-hand perspectives of key stakeholders regarding barriers and opportunities for circular fertilisers deployment following a co-creation approach. Relevant stakeholders representing mainly the three target groups (end-users, producers and local administrations) and describing a variety of EU countries perspectives, are involved into discussions with the main scope of feeding FER-PLAY with a wider range of viewpoints that cover real needs and that can be later reflected on the main outcomes of the project: the assessment of impacts and trade-offs of the selected value-chains (resulting from WP2 “Multi-assessment of impacts, trade-offs and framework conditions of selected alternative fertiliser value chains”), the tailor-made guidelines (resulting from WP3) and the awareness-rising activities (part of WP4 “Dissemination, exploitation and communication”).

Deliverable D3.4 collects the preliminary outcomes from these co-creation discussions carried out from March 2023 to December 2023. It is conceived as a living document to serve as a “database” of inputs received during the activities with external stakeholders and to provide evidence on the process and will be updated if required.

The main concerns coming from the 14 events organised by partners that have gathered a total of 397 participants in co-creation debates can be summarised in the following points:

- The high interest for diversifying the fertilisers commonly used expressed by the end-users (agriculture sector) is hindered by the lack of knowledge on the agronomic and economic benefits of circular fertilisers shown not only by the farmers but also by their regular technical advisors. This makes that well-known synthetic fertilisers are the first choice for conventional farmers.

- The producers sector reflects the necessity of overcoming social acceptance mistrust and making the production cost-effective. The figure of a technical advisor inside the staff of the circular fertiliser producer company becomes crucial in this sense to improve the relationship with the end-user.

- Clarification on regulatory barriers (at local and European level) are highly required to unlock the market potential for circular fertilisers.

All details from the different events and the main outcomes gathered in each of them can be found in this document with a final summary inside the conclusions.

1. Introduction

FER-PLAY is a Horizon Europe project facilitating the uptake of circular fertilisers, to protect ecosystems, decrease EU dependence on fertiliser imports, foster circularity and improve soil health. The project will map and assess circular fertilisers made from secondary raw materials, such as manure, and highlight their multiple benefits in order to promote their wide-scale production and use on field.

The wider use of circular fertilisers that are already marketable, like the seven ones analysed in detail within the project, is currently hindered due to several reasons. Firstly, there is little awareness among end-users about the potential that they offer to partially/totally substitute synthetic fertilisers. Their availability, their composition and the way of distribution on the fields, together with their economic and agronomic benefits, are aspects that are mostly unknown by the agriculture sector. Secondly, the producers of these circular fertilisers suffer in many cases from the uncertainty on the regulatory framework and do not always have a clear market strategy towards the end-users sector. Thirdly, the public administrations are not fully concerned about the potential that this new market can develop in their territory at environmental, economic and social level.

FER-PLAY foresees an important effort to understand the different perspectives of these three stakeholder groups (end-users, producers and public administration) as to address their main concerns in specific guidelines to be elaborated by the project for each target group, as well as for the detailed analysis on the impacts and opportunities at economic, regulatory, social and environmental level that the project is conducting. To this aim, a specific Work Package has been dedicated to cover these discussions and the approach selected as most suitable was to follow co-creation principles, meaning to systematically share, mobilise and activate knowledge[1]. The social acceptance of circular fertilisers, a key point that is hindering the market, was assessed through surveys discussed and disseminated during these events. Last but not least, the feedback gathered through these activities will also serve as input for appropriate messages within the dissemination activities, guaranteeing a maximum impact.

The following table summarises the main co-creation role assigned by the project to the three groups targeted within the activities, whereas the Table 2 includes the main specific objectives expected to be achieved.

[1] Triste, L. September 2018. Communities of practice for knowledge co-creation on sustainable dairy farming.

Group	Co-creation role
Fertiliser producers	Provide perspectives on: - existing value chains e.g., availability, characteristics, logistics; - technical, economic, and commercial conditions that may impact the manufacturing and market deployment of the circular fertilisers; - on end-users' perceptions from their point of view.
Fertiliser end-users	Provide perspectives on existing local value chains and main concerns/ drivers on the use of circular fertilisers, including agronomic performance and regulatory uncertainty. Provide information on real cases successful in the reduction of conventional fertilisers. Propose financing models to support farmers in their transition to circular fertilisers.
Local administration and policy makers	Provide perspectives on current policy and institutional obstacles for the deployment of the value chains and foreseen orientation of policies in the mid- and long-term.

Table 1. Co-creation role assigned to each group targeted within FER-PLAY project

Target group	Achievement indicator	Value	To be reached by
Fertiliser end-user	N. surveys collected	150	M24
Fertiliser producer	N. producers involved	120	M24
Local administration/policy makers	N. administrators involved	30	M24

Table 2. Specific objectives foreseen for the co-creation activities

The co-creation activities were carried out inside events of diverse typology (in presence/online, workshops/seminars/focus groups) which were organised by the different partners involved in the devoted WP, whereas the overall coordination was done by CIC. As to foster networking and the sharing of knowledge, some of the events were organised together with other EU/national/local funded projects/platform/initiatives.

This document provides the main outcomes resulting from the **14 co-creation events** carried out up to date (from March 2023 to Decembre 2023, against 27 activities expected by Sep 24), that have involved a total of **397 participants** into discussions and that have network with 10 EU/national funded projects/platforms/initiatives.

The following sections include all the details of each event (some, like the agenda, might be in the national language of the hosting country) together with a summary of the discussion and the main conclusions to be taken into consideration for the rest of FER-PLAY activities.

In compliance with the ethical principles and relevant legislations, personal data (such as name, email address, organization, target group; never sensitive information) has been collected to the people participating in the co-creation activities with a previous informed consent. This information

is subject of confidentially and handled in line with the General Data Protection Regulation (2016/679/EU) – the process overseen by the FERPLAY Open Science and Data Manager, David Fernández from CETENMA.

2. Co-creation events with end-users

The agriculture sector is one of the three stakeholders group targeted by FER-PLAY project. Within the project co-creation events dedicated to farmers and conducted by partners representative of the sector (ASAJA, COLDIRETTI, INAGRO and NATURLAND), the project has fostered the discussions on the agronomic and economic value of these circular fertilisers. Moreover, it has been also the opportunity to launch the surveys regarding to the social acceptance of circular fertilisers that are being collected by the project within WP2 assessment activities.

The following table provides the main data related to the commitments from these events and the achievements obtained so far.

Commitment targeting the end-users	Deadline	Achieved value (Dec. 23)
150 surveys on social acceptance collected	Aug. 24	278
12 events (see section 2)	Sept. 24	9
600 participants (farmers and technicians)	Sept. 24	242

Table 3. Commitments linked to the co-creation activities dedicated to circular fertiliser end-users

Thanks to these co-creation activities, valuable inputs have been received as to be considered in the guidelines to be elaborated by the project (D3.1) focusing on the final user. The main important message to be highlighted is that the high interest for diversifying the fertilisers commonly used expressed by the agriculture sector is hindered by the lack of knowledge shown not only by the farmers but also by the advisors. This makes that well-known synthetic fertilisers are the main choice for conventional farmers. In particular, the main issues are:

- Availability of circular fertilisers at local level is not clear.
- There is a lack of knowledge on their chemical composition and how to be distributed on the soil (dose, timing and machinery for the different crops).
- The end-users are not well-informed about the agronomic and economic benefits that the application of circular fertilisers mean.

As reported in the previous table, a total of 9 events with end-users (some in presence and some online) have been celebrated from March 2023 till December 2023, gathering 242 participants. The following sections detail the events features and main outcomes resulting from each of them. .

Agendas and event-related information were created in local languages, to avoid language barriers and foster the participation of local stakeholders.

2.1. Event with end-users from Spain (30/05/2023)

Responsible partner:	ASAJA
Target public:	Farmers
Type of event:	Workshop
Modality:	Presential
Joint event with fellow project / FER-PLAY dedicated event:	FER-PLAY Dedicated Event
Main scope:	Farmers Training
Location (Country acronym):	Madrid (ES)
Date (dd/mm/yy):	30/05/2023
Duration (hours):	2 hours
Impact:	30 participants

Table 4. Event Main Features (Workshop in Spain on 30/05/2023)

On 30/05/2023, ASAJA held a workshop dedicated to fertilisation, during which the three of the best valued circular fertilisers selected to be further assessed within the framework of FER-PLAY project were presented.

In the following Figure 1, the Agenda of the Event is displayed.

Figure 1. Agenda of the workshop on 30/05/2023 in Spain

In Figure 2, displayed below, some of the photos taken during the Event on 30/05/2023 in Spain are shown.

Figure 2. Photos from the workshop on 30/05/2023 in Spain

2.1.1. SUMMARY OF THE DISCUSSION

Two main speakers participated in the workshop held on 30/05/2023 in Spain. The first of them was Jose Antonio Sotomayor, technical director of a company dedicated to the commercialization of fertilisers, who came to present a new fertiliser product of mineral origin. He also explained the current situation of fertilisation in Spain, indicating the scarcity of circulars of fertiliser products that agricultural producers have when they need to select fertiliser products to add nutrients to their plantations, and the scarcity of circulars to the use of synthetic chemicals.

The second of them was Manuel Lucena Marcos, a technician from the ASAJA Innovation Department, who presented three of the fertilisers that have been selected in FER-PLAY (struvite, spent mushroom substrate and compost of vegetable and food remains) to undergo further assessment on their impacts. Participants showed special interest on struvite, a not well-known fertiliser in Spain. This interest is stimulated by the prohibition of the use of phosphate salts in Spain, which currently can be used only in the Netherlands, Belgium, Germany, France, Denmark and in the United Kingdom.

2.1.2. RELEVANT OUTCOMES FOR THE PROJECT

Three of the best valued circular fertilisers were presented and described, causing an enormous interest of the participants of the event.

The farmers attending the event presented the following difficulties connected to the actual situation: the difficulty to find circular fertilisers at the moment of necessity and the high transportation costs, due to the enormous volume required in comparison to synthetic fertilisers.

In their opinion, the use of circular fertilisers coming from manure or other organic by-products, is only feasible in case of the closeness to the producers of these fertilisers.

2.2. Event with end-users from Germany (06/06/2023)

Responsible partner:	NATURLAND
Target public:	Farmers, advisers
Type of event:	Workshop
Modality:	In presence
Joint event with fellow project / FER-PLAY dedicated event:	Joint event with German BÖL project ProBio
Main scope:	Compost
Location (Country acronym):	Jesewitz (DE)
Date (dd/mm/yy):	06/06/2023
Duration (hours):	6 hours
Impact:	11 participants

Table 5. Event Main Features (Workshop in Germany on 06/06/2023)

The event entitled "The potential of compost in organic farming - ProBio and FER-PLAY event" was held on 06/06/2023. The event was organised in cooperation with ProBio, which is a German funded project dealing with compost use for organic farming.

The agenda of the Event is shown in the following Figure 3.

NATURLAND INFORMATION

Naturland

„Das Potenzial von Kompost im Ökolandbau - ProBio und FER-PLAY Veranstaltung“

Sehr geehrte Naturland Mitglieder,
Liebe Bäuerinnen, liebe Bauern,

wir laden Sie herzlich zu unserer Infoveranstaltung am
06.06.2023 von 8:45 bis 15:00 Uhr ein.

Treffpunkt: Rösl Kompost- und Erdenwerk, Zschettgauer Str. 3, 04838 Jesewitz
Kosten: 10 € p. P. für Essen und Getränke

Thema:

Im Projekt ProBio (Untersuchungen zur optimalen Produktion und pflanzlichen Verwertung von Biogut- und Grüngutkompost im ökologischen Landbau) wird die Wirkung und das Einsatzpotenzial von Komposten aus dem Kompostwerk im ökologischen Landbau mithilfe von Feld- und Praxisversuchen untersucht. Komposte stellen gerade auf viehlosen und viehharmen Betrieben eine wertvolle Nährstoffquelle für den ökologischen Landbau dar, werden jedoch häufig aufgrund von Vorbehalten oder logistischen Hemmnissen nicht eingesetzt. Diese Veranstaltung soll interessierte Landwirt:innen informieren, die Gelegenheit zum Austausch mit der Kompostbranche und Berufskolleg:innen bieten und den Einsatz von Kompost in der Öko-Landwirtschaft fördern. Das EU-Projekt FER-PLAY, das sich mit der Förderung alternativer organischer Düngemittel befasst, wird ebenfalls im Rahmen der Veranstaltung vorgestellt.

Programm:

Uhrzeit			Referent:in
08:45 – 9:00	Ankommen, Begrüßung und Vorstellung	Rösl Kompost- und Erdenwerk, Zschettgauer Str. 3 04838 Jesewitz, OT Liemehna Link in Google Maps	Annemarie Ohlwärter (Naturland)
9:00 – 11:30	Besichtigung der Kompostierungsanlage		Stephan Lehmann (Firma Rösl, Leiter

Öko-BeratungsGesellschaft mbH | Eichethof 1 | 85411 Hohenkammer
Tel. 08137 / 6372 -902 | Fax 08137 / 6372 -919 | info@naturland-beratung.de | www.naturland-beratung.de
Bankverbindung: Sparkasse Dachau | SWIFT: BYLADEM1DAH | IBAN: DE62700515400000664912
Finanzamt Freising | USt-ID-Nr. DE170408212 | Steuer-Nr. 115/134/20198 | HRB 145019 München |
Geschäftsführer: Martin Bär

NATURLAND INFORMATION

Naturland

			Natur- und Umweltschutz)
11:30 - 12:30	Fahrt zum Gemeinde-haus Liemehna (ca. 3 km), gemeinsamer Mittagsimbiss	Gemeindezentrum Liemehna, Am Anger 9a, 04838 Jesewitz, OT Liemehna Link in Google Maps	
12:30 – 13:00	Vorstellung der Ergebnisse zur Kompostwirkung aus dem Projekt ProBio, Informationen zu Verbandsrichtlinien beim Komposteinsatz		Annemarie Ohlwärter (Naturland)
13:00 - 13:30	Vorstellung des FER-PLAY Projekts		Ramona Kinder (Naturland)
13:30 - 14:00	Kompostanwendung in der Praxis, Düngewirkung und rechtliche Rahmenbedingungen		Nikolas Zöller (Institut für Abfallwirtschaft und Sekundärrohstoffe)
14:00 – 14:30	Kompostanwendung im Betrieb - Praktikervortrag		angefragt
14:30 – ca. 15:00	Abschlussdiskussion, Ende der Veranstaltung		Moderation: Annemarie Ohlwärter

Anmeldung bitte bis 02.06.2023 über die Naturland App oder auf unserer Homepage unter Veranstaltungen für Erzeuger (naturland.de) direkt in der Terminansicht.

Bei weiteren Fragen zur Veranstaltung melden Sie sich gerne bei Annemarie Ohlwärter, Tel: 015165905190

Wir freuen uns auf Ihre Teilnahme!

Ihre Beratung für Naturland und die ProBio-Projektpartner

fer▸play Funded by the European Union

Gefördert durch Bundesministerium für Ernährung und Landwirtschaft aufgrund eines Beschlusses des Deutschen Bundestages

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Finanzamt Freising | USt-ID-Nr. DE170408212 | Steuer-Nr. 115/134/20198 | HRB 145019 München |
Geschäftsführer: Martin Bär

Figure 3. Agenda of the workshop on 06/06/2023 in Germany

In Figure 4 some photos taken during different stages of the workshop are presented.

Figure 4. Photos from the workshop on 06/06/2023 in Germany

2.2.1. SUMMARY OF THE DISCUSSION

The event included a field visit to a compost plant, and after the visit the following issues were discussed during the workshop:

- Presentation of the results on the compost effect.
- Information on standards and guidelines for compost use (EU organic standards and private standards).
- Compost application in practice, fertilising effect and legal framework conditions (fertiliser regulations).
- Presentation of FER-PLAY project and opportunities for farmers and producers.

The group of participants was small, enabling an intensive discussion.

2.2.2. RELEVANT OUTCOMES FOR THE PROJECT

During the discussion, it turned out that the farmers are convinced that the use of circular fertilisers is necessary, especially compost due to the physical properties and the supply of organic carbon together with nutrients that have a significant benefit on the soil in the long-term. But at the same time, they find the price for compost coming from this compost facility too high. They also have doubts whether the “special” type of composts with very high prices are useful as the applied quantities – especially in the formulation compost-tea – are very low.

2.3. Event with end-users from Italy (07/06/2023)

Responsible partner:	COLDIRETTI
Target public:	End-users
Type of event:	Seminar
Modality:	Online
Joint event with fellow project / FER-PLAY dedicated event:	Joint with institutional activities of COLDIRETTI
Main scope:	Discussing and collecting end-users' opinion on several topics of interest for the farmers, as soil management, climate changes, fertilisers use, water use, animal welfare, precision farming.
Location (Country acronym):	IT
Date (dd/mm/yy):	07/06/2023
Duration (hours):	1.5 hours
Impact:	12 participants

Table 6. Event Main Features (Seminar in Italy on 07/06/2023)

On 07/06/2023 an online seminar organised by COLDIRETTI took place. The agenda of the event is available in Figure 5 which follows.

COLDIRETTI

fer▸play

INCONTRO COLDIRETTI – UNIVERSITA' DI FIRENZE (DAGRI-UNIFI)

Mercoledì 7 giugno 2023

Palazzo Rospigliosi (Sala Archivio-Online*) – Via XXIV Maggio, 43 - Roma

PROGRAMMA

Ore 10,30 - 10,45

Saluti e presentazioni

Dott. Stefano Masini (Capo Area Ambiente e Territorio Coldiretti)

Ore 10,45 - 11,45

Confronto su potenziali attività di collaborazione tra Coldiretti e Dipartimento di Scienze e Tecnologie Agrarie, Alimentari, Ambientali e Forestali dell'Università di Firenze (UNIFI-DAGRI)

Prof. Simone Orlandini e Dott. Marco Mancini (DAGRI- UNIFI)

(Attraverso un confronto aperto con i partecipanti, finalizzato anche ad eventuali approfondimenti e/o collaborazioni future, i ricercatori esporranno le principali esperienze di UNIFI-DAGRI su alcuni temi di particolare interesse per le imprese agricole, tra i quali: ***Life cycle assessment*** delle coltivazioni erbacee; **suolo** (impatti fertilità/biodiversità e stoccaggio di carbonio); **uso dell'acqua** in agricoltura ed il *water footprint*; **apicoltura**; **cambiamenti climatici** (impatti sulle coltivazioni, strategie di adattamento e mitigazione con *focus* sul corretto utilizzo dei digestati del biogas e dei fertilizzanti); **benessere animale**; **agricoltura di precisione** e **sviluppo di filiere locali**).

Ore 11,45 - 12.00

Comunicazione sul Progetto FER-PLAY (Multi-assessment of alternative fertilisers for promoting local sustainable value chains and clean ecosystems)

https://call.lifesizecloud.com/736079

The FER-PLAY project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement N° 101060426.

Figure 5. Agenda of the seminar on 07/06/2023 in Italy

Some screenshots taken during the online seminar in Italy are presented in Figure 6.

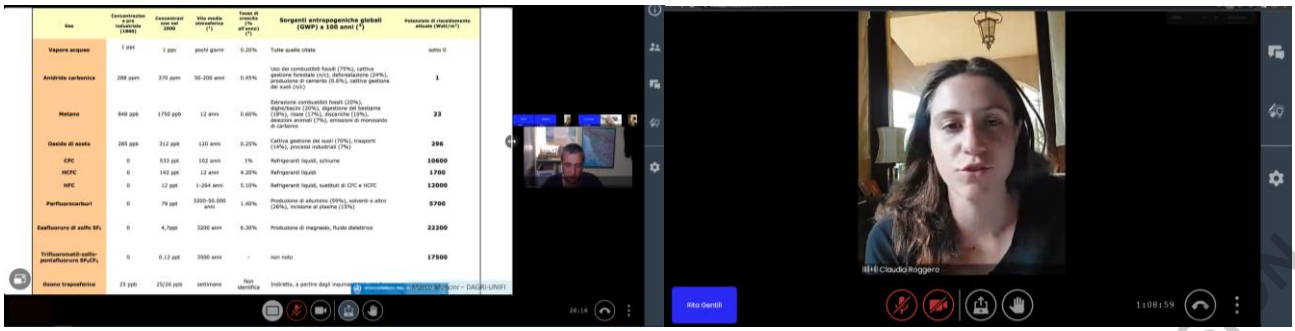


Figure 6. Screenshots from the seminar on 07/06/2023 in Italy

2.3.1. SUMMARY OF THE DISCUSSION

The online event on 07/06/2023 organised by COLDIRETTI aimed at discussing with some end-users on several topics of interest for the farming activity, such as soil management, climate changes, fertilisers use, water use, animal welfare, precision farming, organic farming. In particular, the event gave the chance to present to farmers several research and innovation activities which can be helpful to face those critical challenges that the agricultural sector is struggling in the last years.

The meeting was opened by Francesco Ciancaleoni, internal staff of COLDIRETTI and member of FER-PLAY Working Group. Mr. Ciancaleoni pointed out the importance of cooperation with the academy and more generally with researchers, to improve the overall sustainability of the farming practices, which takes into account its environmental, social and economic aspects.

The floor was then taken by Francesco Giardina, director of the Organic Farming Association of COLDIRETTI, who recalled the EU objectives in terms of organic agricultural surface and highlighted how the organic farming moves between agriculture and environmentalism.

The next speaker was Marco Mancini, researcher at University of Pisa (Dipartimento di Scienze e Tecnologie Agrarie, Alimentari, Ambientali e Forestali) who presented some of the research and innovation activities in which the University is involved, dealing with agricultural topics.

The final speech was done by Rita Gentili, from COLDIRETTI, who presented FER-PLAY project, the results reached so far and the co-creation process which is implemented within the project to collect opinions of end-users. Following this aim, the survey designed within the project to assess the main key aspects (both barriers and opportunities) of the social acceptance of circular fertilisers was presented with the request to the farmers to fill it in.

A discussion then opened with some reflections on the following topics:

- Claudia Roggero presented the climate change that affects all agricultural activities, jeopardizing the survival of many farms. On the beekeeping sector this is particularly important, many beehives are dying and the production of honey is dramatically decreasing, putting at risk beekeepers' income.
- Davide Conti spoke about the difficulties in the organic farming to manage pathophysiological diseases.
- Luca Motta underlined the importance to move towards a reduced use of chemical fertilisers to protect the environment and the soil.
- Francesco Ciancaleoni explained the specific interest of COLDIRETTI towards the digestate coming from biogas plants fed with livestock waste, to extend the circularity of the agricultural production process.
- Francesco Giardina, in connection to what said by the previous speaker, presented the need of supporting the livestock sector which has been often subject of unjustified critics for being unsustainable.

2.3.2. RELEVANT OUTCOMES FOR THE PROJECT

General attention of young farmers shown towards more environmentally sustainable farming practices is to be underlined: this is an important background condition for the promotion of circular fertiliser and a target audience to be specifically addressed by FER-PLAY project.

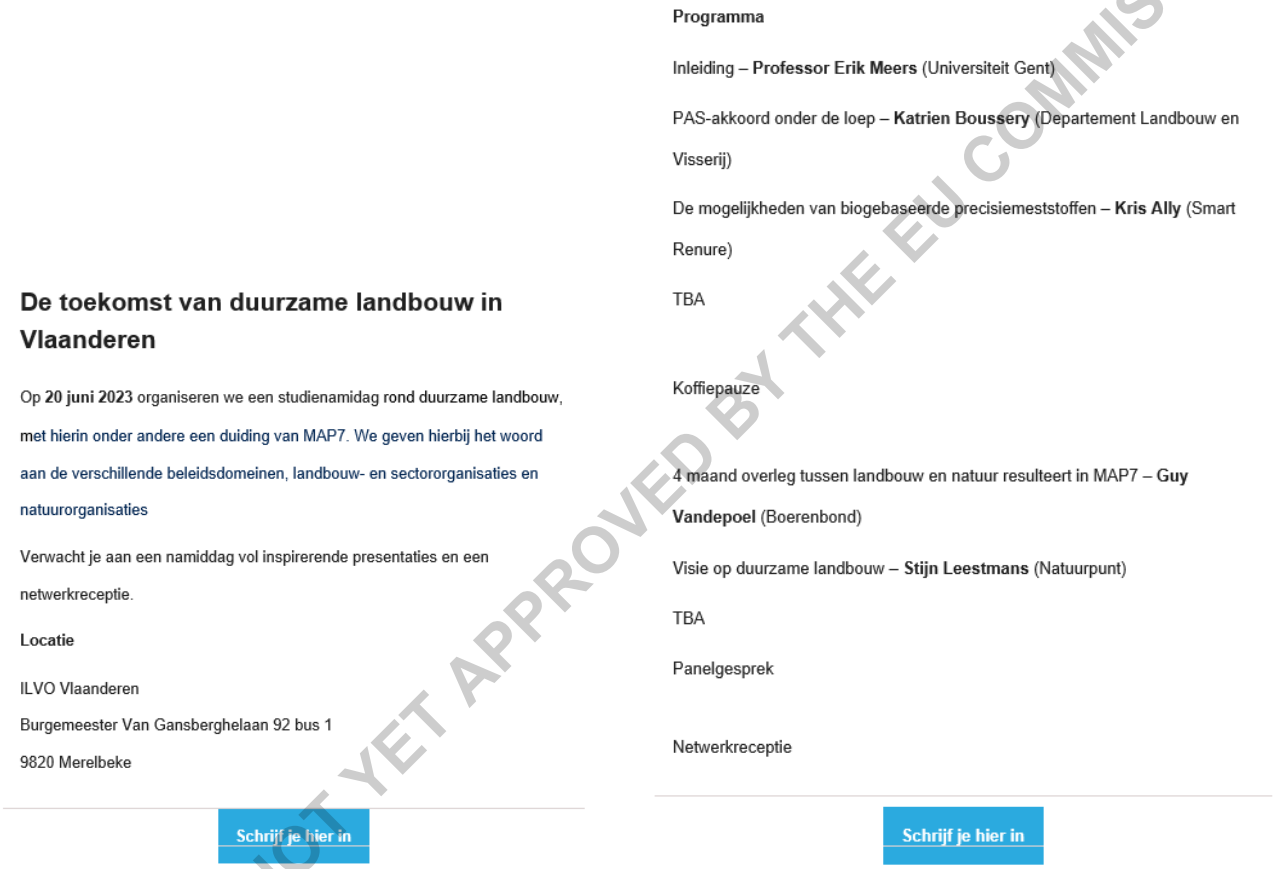
2.4. Event with end-users from Belgium (20/06/2023)

Responsible partner:	INAGRO
Target public:	Researchers, fertiliser producers, policy, farmers
Type of event:	Workshop
Modality:	Physical meeting
Joint event with fellow project / FER-PLAY dedicated event:	Joint with the Flemish nutrient platform (Nutricycle Vlaanderen) and NOVAFERT
Main scope:	Future of sustainable agriculture in Flanders
Location (Country acronym):	Melle (BE)
Date (dd/mm/yy):	20/06/2023
Duration (hours):	3.5 hours (FER-PLAY was only briefly mentioned)
Impact:	56 participants

Table 7. Event Main Features (Workshop in Belgium on 20/06/2023)

On 20/06/2023 in Melle (Belgium) a workshop took place with the main objective to discuss the future of the sustainable agriculture in Flanders. The workshop was a joint event with Nutricycle Vlaanderen (https://nutricycle.vlaanderen/) and NOVAFERT project (https://www.novafert.eu/).

The agenda of the event and the photos taken during the event are presented below (see Figure 7 and Figure 8, respectively).



De toekomst van duurzame landbouw in Vlaanderen

Op **20 juni 2023** organiseren we een studienamidag rond duurzame landbouw, met hierin onder andere een duiding van MAP7. We geven hierbij het woord aan de verschillende beleidsdomeinen, landbouw- en sectororganisaties en natuurorganisaties

Verwacht je aan een namiddag vol inspirerende presentaties en een netwerkreceptie.

Locatie

ILVO Vlaanderen
Burgemeester Van Gansberghelaan 92 bus 1
9820 Merelbeke

Schrijf je hier in

Programma

Inleiding – **Professor Erik Meers** (Universiteit Gent)

PAS-akkoord onder de loep – **Katrien Boussery** (Departement Landbouw en Visserij)

De mogelijkheden van biogebaseerde precisiemeststoffen – **Kris Ally** (Smart Renure)

TBA

Koffiepauze

4 maand overleg tussen landbouw en natuur resulteert in MAP7 – **Guy Vandepoel** (Boerenbond)

Visie op duurzame landbouw – **Stijn Leestmans** (Natuurpunt)

TBA

Panelgesprek

Netwerkreceptie

Schrijf je hier in

Figure 7. Agenda of the workshop on 20/06/2023 in Belgium

Figure 8. Photos from the workshop on 20/06/2023 in Belgium

2.4.1. SUMMARY OF THE DISCUSSION

The event co-organised by FER-PLAY on 20/06/2023 gathered 56 quadruple helix stakeholders, who received a goodie bag with a FER-PLAY flyer with the QR-code of the survey placed on the back.

During the event, there were presentations on the following topics:

- The introduction was done by Professor Erik Meers (Ghent University; Coordinator of the NOVAFERT sister project), in which he also highlighted the importance of Community-supported agriculture (CSA) projects like FER-PLAY and its sister project NOVAFERT.
- Then PAS (Programme-based approach to Nitrogen) was presented by Katrien Boussery (Department of Agriculture and Fisheries), who talked about the consequences on the current and future legislation regarding nitrogen emissions.
- The opportunities of biobased precision fertilisers were explained by Kris Ally (Smart Renure), who talked about the importance of recycling-derived fertilisers (RDFs) and a fertiliser machine that was developed by Smart Renure, specifically suited for the application of RDFs.
- The combination of precision farming and mineral fertiliser replacement in potatoes was presented by Jacob Van den Borne (farmer), who talked about the innovative practices he is implementing on his farm.
- The vision of nature organisations and farmer organisations on the new Manure Action Plan was presented by Guy Vandepoel (Boerenbond), Mark Wulfrancke (ABS) and Stijn Leestmans (Natuurpunt).
- Bart De Schutter (VLM) presented lessons of the manure report in Flanders.

Afterwards, a panel debate with all the speakers took place.

2.4.2. RELEVANT OUTCOMES FOR THE PROJECT

It was highly interesting to learn how nature protection organisations, on the one hand, and farmer organisations, on the other hand, were able to find an agreement, although they have completely opposite ideas. In general, all participants believed that new technologies could transform agricultural practices, but important points of attention for implementation are profitability, legislative aspects and reliability.

2.5. Event with end-users from EU (28/06/2023)

Responsible partner	INAGRO
Target public:	Researchers, fertiliser producers, policy, farmers
Type of event:	Co-creation workshop
Modality:	Online meeting
Joint event with fellow project / FER-PLAY dedicated event:	Joint with the EU ALFA project
Main scope:	Co-creation workshop
Date (dd/mm/yy):	28/06/2023
Duration (hours):	2.5 hours (FER-PLAY had 15 min. presentation)
Impact:	14 participants

Table 8. Event Main Features (Workshop on 28/06/2023)

On 28/06/2023 in Belgium an online co-creation workshop took place. It was a joint event with the ALFA project (Upscaling the market uptake of renewable energy by Unlocking the biogas potential of livestock farming: https://alfa-res.eu/).

The agenda of the event is presented below in Figure 9.

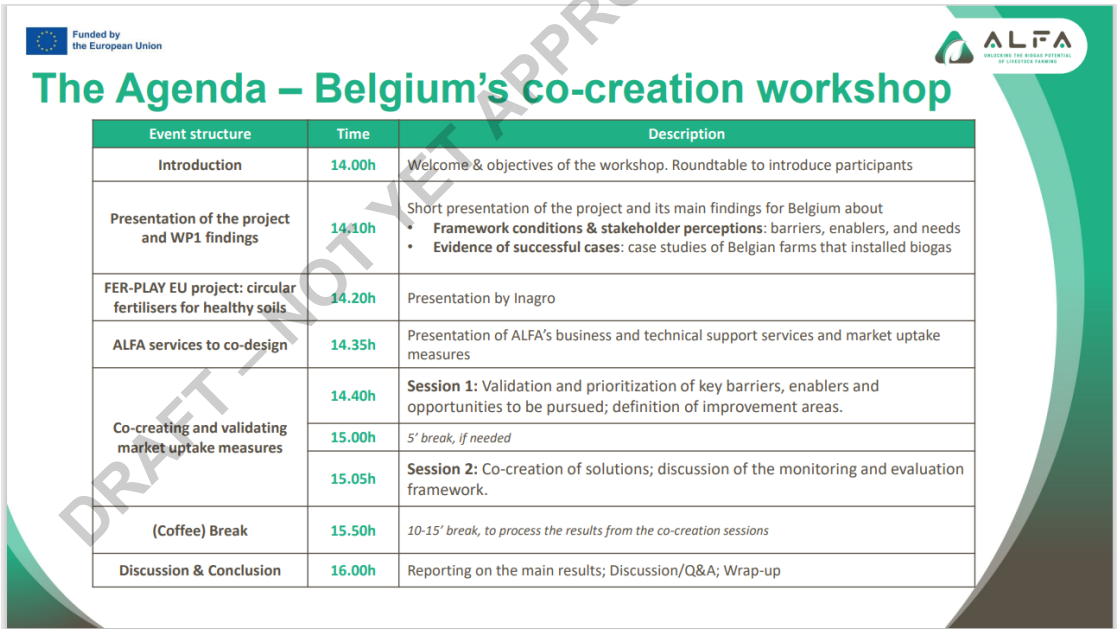


Figure 9. Agenda of the workshop on 28/06/2023

Some screenshots from the workshop when FER-PLAY project was presented to the participants are reported on the following Figure 10.

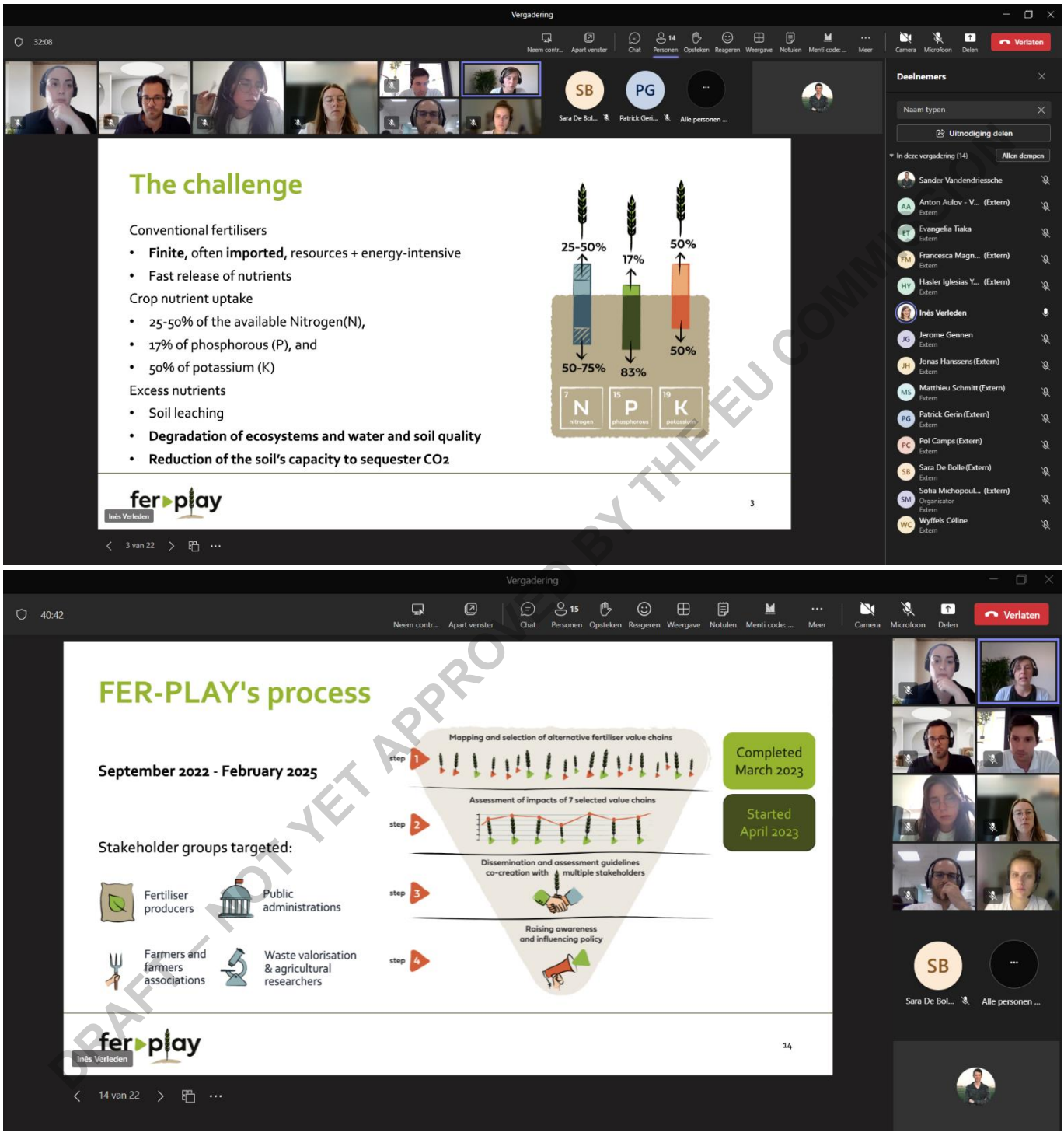


Figure 10. Screenshots from the workshop on 28/06/2023

2.5.1. SUMMARY OF THE DISCUSSION

Through supporting solutions and developing measures for the introduction of biogas systems and nutrient recovery in livestock farming, the ALFA project aims to accelerate the roll-out of biogas. To identify bottlenecks and needs, a co-creation workshop was organised, where input was important to provide tailor-made support.

The following points are the ones which merged during the discussion:

- After the introduction, ALFA project and its results were presented.
- Then FER-PLAY presentation on circular fertilisers took place.
- The next step was the explanation of ALFA service for co-design.
- The important part of the discussion was the one about co-creation and validation of market introduction measures. This part included the presentation of validation and prioritisation of key barriers, drivers and opportunities to be pursued; definition of areas for improvement, on one hand, and co-creation of solutions; discussion of monitoring and evaluation framework, on the other hand.
- During the final part the discussion took place, after which the conclusions were pointed out.

2.5.2. RELEVANT OUTCOMES FOR THE PROJECT

The following barriers for farm-scale anaerobic digestion implementation were evaluated from low to critical urgency (see Figure 11 below).

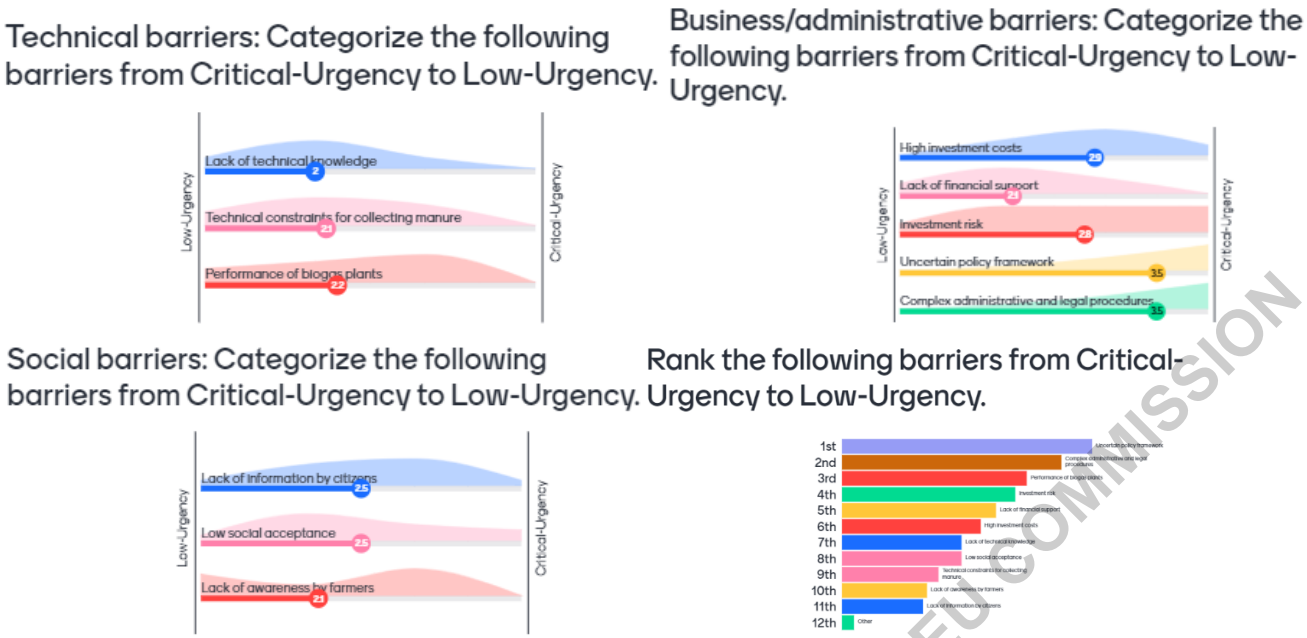


Figure 11. Polls concerning barriers for farm-scale anaerobic digestion implementation

Then the participants were asked to categorize the support needs of different types. The results of these polls are presented in Figure 12 which follows.

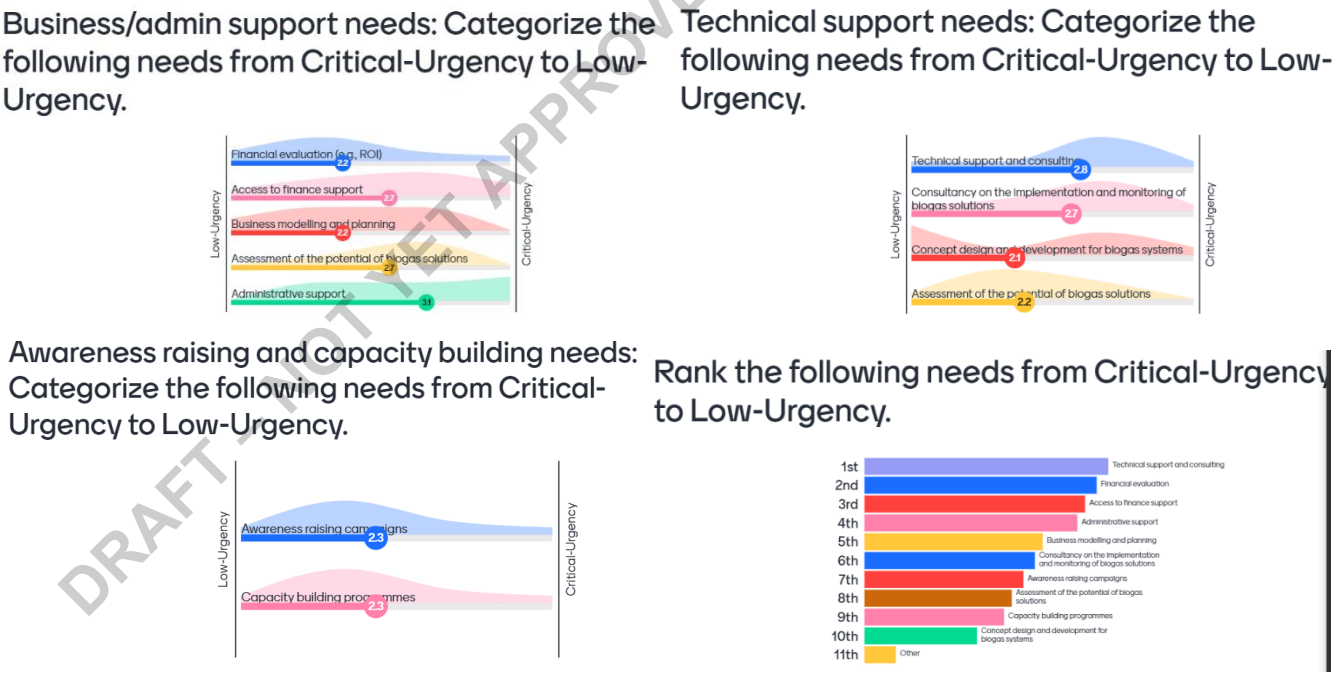


Figure 12. Polls concerning the needs in support

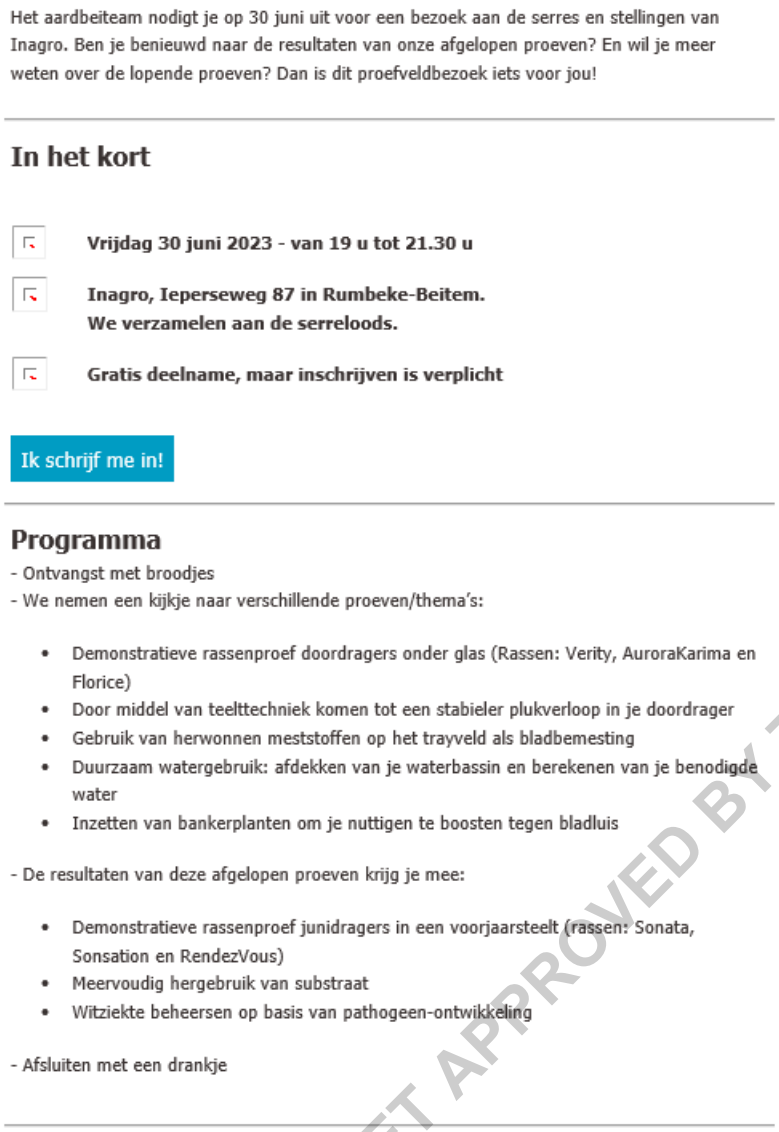
2.6. Event with end-users from Belgium (30/06/2023)

Responsible partner:	INAGRO
Target public:	Researchers, farmers (horticulturists)
Type of event:	Field trial visit
Modality:	Physical event
Joint event with fellow project / FER-PLAY dedicated event:	Joint with IPMworks project
Main scope:	Interactive on-field session with farmers
Location (Country acronym):	Inagro, Roeselare (BE)
Date (dd/mm/yy):	30/06/2023
Duration (hours):	2.5 hours
Impact:	36 participants

Table 9. Event Main Features (Workshop in Belgium on 30/06/2023)

On 30/06/2023 in Belgium, INAGRO organised a field trial visit in which some questions of special interest for FER-PLAY project were discussed with participants. It was a joint event with IPMworks project ("An EU-wide farm network demonstrating and promoting cost-effective IPM strategies"; https://ipmworks.net/).

The agenda of the event is presented below in Figure 13.



Het aardbeiteam nodigt je op 30 juni uit voor een bezoek aan de serres en stellingen van Inagro. Ben je benieuwd naar de resultaten van onze afgelopen proeven? En wil je meer weten over de lopende proeven? Dan is dit proefveldbezoek iets voor jou!

In het kort

Vrijdag 30 juni 2023 - van 19 u tot 21.30 u

Inagro, Ieperseweg 87 in Rumbeke-Beitem.
We verzamelen aan de serreloods.

Gratis deelname, maar inschrijven is verplicht

Ik schrijf me in!

Programma

- Ontvangst met broodjes
- We nemen een kijkje naar verschillende proeven/thema's:

  - Demonstratieve rassenproef doordragers onder glas (Rassen: Verity, AuroraKarima en Florice)
  - Door middel van teelttechniek komen tot een stabieler plukverloop in je doordrager
  - Gebruik van herwonnen meststoffen op het trayveld als bladbemesting
  - Duurzaam watergebruik: afdekken van je waterbassin en berekenen van je benodigde water
  - Inzetten van bankerplanten om je nuttigen te boosten tegen bladluis

- De resultaten van deze afgelopen proeven krijg je mee:

  - Demonstratieve rassenproef junidragers in een voorjaarsteelt (rassen: Sonata, Sonsation en RendezVous)
  - Meervoudig hergebruik van substraat
  - Witziekte beheersen op basis van pathogeen-ontwikkeling

- Afsluiten met een drankje

Figure 13. Agenda of the field trial visit on 30/06/2023 in Belgium

In Figure 14 some photos taken during the field trial visit on 30/06/2023 are presented.

Figure 14. Photos from the field trial visit on 30/06/2023 in Belgium

2.6.1. SUMMARY OF THE DISCUSSION

Participants to the event circulated in two groups between all the different stands, where they received information and INAGRO had the opportunity to make some interactive questions for the interest of the project.

At FER-PLAY stand, the project poster was hung up and three circular fertilisers were displayed. FER-PLAY flyer was distributed as well, with the survey QR-code printed on the back. During the 10 minutes time slot per group, the project and products were presented and there was time for two quick interactive questions:

- “Would you be interested in using this kind of products at your company?”
- “Do you see a lot of practical and/or legislative bottlenecks?”

2.6.2. RELEVANT OUTCOMES FOR THE PROJECT

When the participants were asked if they would consider using circular fertilisers, half of then answered in the affirmative, other half answered in the negative.

Participants were also asked to put a sticker on a poster as shown in Figure 15 which follows, with their indication of the technical and legislative bottlenecks (The x-axis indicates the legislation, from little to a lot. The y-axis indicated the technical side, from little to a lot of bottlenecks).

Figure 15. Results of the interactive question on “where do you see bottlenecks?”

These are some of the conclusions which came out from the discussion:

- Profit margins are small, especially for fertilisers cost, so a lot would depend on the price.
- Legislation also needs to allow it, although this seems less relevant for horticulture than in agriculture.
- Although some participants saw few problems with the technical use of the products, in some cases, the fertilisers need to be purer to be used in horticulture fertilisation systems.

2.7. Event with end-users from Belgium (07/09/2023)

Responsible partner	INAGRO
Target public:	Researchers, farmers
Type of event:	Company visit
Modality:	Physical event

Joint event with fellow project / FER-PLAY dedicated event:	Joint with local demonstration project Boost Pocketvergisting & Nabewerking (small-scale anaerobic digestion and processing)
Main scope:	Interactive company visit - sewage treatment plant
Location (Country acronym):	Aquafin, Antwerpen (BE)
Date (dd/mm/yy):	07/09/2023
Duration (hours):	3 hours
Impact:	16 participants

Table 10. Event Main Features (Workshop in Belgium on 07/09/2023)

On 07/09/2023 in Belgium, INAGRO organised a company visit at a sewage treatment plant in which FER-PLAY results obtained so far were discussed with participants. It was a joint event with a Flemish demonstration project Boost Pocketvergisting en nabewerking (https://inagro.be/projecten/boost-pocketvergisting-en-nabewerking).

The agenda of the event is presented below in Figure 16.

Figure 16. Agenda of the company visit on 07/09/2023 in Belgium

In Figure 17 a photo taken during the company visit on 07/09/2023 is presented.

Figure 17. Photo from the field trial visit on 07/09/2023 in Belgium

2.7.1. SUMMARY OF THE DISCUSSION

All participants joining the company visit at a sewage treatment plant listened to a presentation on the project and different nutrient recovery techniques and their circular fertilisers, with focus on ammonia stripping, after which a guided tour of the facility and to the ammonia stripping installation was hosted.

2.7.2. RELEVANT OUTCOMES FOR THE PROJECT

The participants were very interested in the ammonia stripping technique and the product (ammonia salts) it provides. There was a special interest in the price details, both investment and operational costs of the technique, and the market price of the product.

2.8. Event with end users from Germany (12/09/2023)

Responsible partner:	NATURLAND
Target public:	Farmers, advisers, producers
Type of event:	Workshop

Modality:	In presence
Joint event with fellow project / FER-PLAY dedicated event:	Joint event with German BÖL project ProBio
Main scope:	Compost
Location (Country acronym):	Borgstedtfelde, DE
Date (dd/mm/yy):	12/09/2023
Duration (hours):	4 hours
Impact:	11 participants

Table 11. Event Main Features (Workshop in Germany on 12/09/2023)

The event entitled "The potential of compost in organic farming - ProBio and FER-PLAY event" was held on 12/09/2023. ProBio is a German funded project (http://www.projekt-probio.de) dealing with compost use for organic farming.

The agenda of the Event is shown in the following Figure 18.

NATURLAND INFORMATION

Naturland

„Das Potenzial von Kompost im Ökolandbau - ProBio und FER-PLAY Veranstaltung“

Sehr geehrte Naturland Mitglieder,
Liebe Bäuerinnen, liebe Bauern,

wir laden Sie herzlich zu unserer Infoveranstaltung am **12.09.2023 von 14:00 bis 18:00 Uhr** ein.

Treffpunkt: AWR BioEnergie GmbH, Borgstedtfelde 15, 24794 Borgstedt
Kosten: keine

Thema:

Im Projekt ProBio (Untersuchungen zur optimalen Produktion und pflanzlichen Verwertung von Biogut- und Grüngutkompost im ökologischen Landbau) wird die Wirkung und das Einsatzpotenzial von Komposten aus dem Kompostwerk im ökologischen Landbau mithilfe von Feld- und Praxisversuchen untersucht. Komposte stellen gerade auf viehlosen und viehharmen Betrieben eine wertvolle Nährstoffquelle für den ökologischen Landbau dar, werden jedoch häufig aufgrund von Vorbehalten oder logistischen Hemmnissen nicht eingesetzt. Diese Veranstaltung soll interessierte Landwirt:innen informieren, die Gelegenheit zum Austausch mit der Kompostbranche und Berufskolleg:innen bieten und den Einsatz von Kompost in der Öko-Landwirtschaft fördern. Das EU-Projekt FER-PLAY, das sich mit der Förderung alternativer organischer Düngemittel befasst, wird ebenfalls im Rahmen der Veranstaltung vorgestellt.

Programm:

Uhrzeit		Ort	Referent:in
14:00 Uhr	Ankommen, Begrüßung und Vorstellung	AWR BioEnergie GmbH Borgstedtfelde 15 24794 Borgstedt Link in Google Maps	Annemarie Ohlwärter (Naturland)
14:15-15:45	Besichtigung der Kompostierungsanlage		
15:45-16:00	Kaffeepause		

Öko-BeratungsGesellschaft mbH | Eichethof 1 | 85411 Hohenkammer
Tel. 08137 / 6372 -902 | Fax 08137 / 6372 -919 | info@naturland-beratung.de | www.naturland-beratung.de
Bankverbindung: Sparkasse Dachau | SWIFT: BYLADEM1DAH | IBAN: DE62700515400000664912
Finanzamt Freising | USt-ID-Nr. DE170408212 | Steuer-Nr. 115/134/20198 | HRB 145019 München |
Geschäftsführer: Martin Bär

NATURLAND INFORMATION

Naturland

16:00-16:30 Uhr	Vorstellung der Ergebnisse zur Kompostwirkung aus dem Projekt ProBio		Lucie Chmelikova (Technische Universität München)
16:30-16:45	Informationen zu Verbandsrichtlinien beim Komposteinsatz		Annemarie Ohlwärter (Naturland)
16:45-17:15	Vorstellung des FER-PLAY Projekts		Ramona Kinder (Naturland)
17:15-17:45	Kompostanwendung im Betrieb - Praktikervortrag		Tilman von Münchhausen (Gut Rosenkrantz)
17:45-18:00 Uhr	Abschlussdiskussion, Ende der Veranstaltung		Moderation: Annemarie Ohlwärter

Anmeldung bitte bis 08.09.2023 über die Naturland App oder auf unserer Homepage unter Veranstaltungen für Erzeuger (naturland.de) direkt in der Terminansicht.

Bei weiteren Fragen zur Veranstaltung melden Sie sich gerne bei Annemarie Ohlwärter, Tel: 015165905190

Wir freuen uns auf Ihre Teilnahme!

Ihre Beratung für Naturland und die ProBio-Projektpartner

Bioland · GreenSurvey · Naturland · Technische Universität München

PREMIUM KOMPOST AWR · fer▸play Funded by the European Union · Gefördert durch Bundesministerium für Ernährung und Landwirtschaft aufgrund eines Beschlusses des Deutschen Bundestages · BÖL

Öko-BeratungsGesellschaft mbH | Eichethof 1 | 85411 Hohenkammer
Tel. 08137 / 6372 -902 | Fax 08137 / 6372 -919 | info@naturland-beratung.de | www.naturland-beratung.de
Bankverbindung: Sparkasse Dachau | SWIFT: BYLADEM1DAH | IBAN: DE62700515400000664912
Finanzamt Freising | USt-ID-Nr. DE170408212 | Steuer-Nr. 115/134/20198 | HRB 145019 München |
Geschäftsführer: Martin Bär

Figure 18. Agenda of the workshop on 12/09/2023 in Germany

In Figure 19 a photo taken during different stages of the workshop is presented.

Figure 19. Photo from the workshop on 12/09/2023 in Germany

2.8.1. SUMMARY OF THE DISCUSSION

The following issues were discussed during the workshop:

- Information on standards and guidelines for compost use (EU organic standards and private standards).
- Presentation of the results on the compost effect.
- Compost application in practice, fertilisingeffect and legal framework conditions (fertiliser regulations).
- Compost application on farm – example.
- Presentation of FER-PLAY project.

The group of participants was small but this enabled an intensive discussion.

2.8.2. RELEVANT OUTCOMES FOR THE PROJECT

Below some relevant outcomes for the project are presented:

- Organic farmers are convinced that the use of circular fertilizers, especially compost, makes sense and is necessary in the long term.
- Educational work still needs to be done on the application and spreading of compost, as some farmers are still very reluctant in some cases.
- Price increases for conventional fertilizers enhance the demand for compost.

Farmers agree that public education is the most important tool. There is still a lot of education to be done on the topic of proper waste separation among the general public, because with proper waste separation, resources can also be reused even better. In this way, they do not end up in the incinerator or landfill.

2.9. Event with end-users from Belgium (15/09/2023)

Responsible partner:	INAGRO
Target public:	Researchers, farmers, policy makers
Type of event:	Company visit
Modality:	Physical event

Joint event with fellow project / FER-PLAY dedicated event:	Joint with local demonstration project Boost Pocketvergisting & Nabewerking (small-scale anaerobic digestion and processing)
Main scope:	Interactive company visit – manure treatment plant
Location (Country acronym):	Staden (BE)
Date (dd/mm/yy):	15/09/2023
Duration (hours):	3 hours
Impact:	56 participants

Table 12. Event Main Features (Workshop in Belgium on 15/09/2023)

On 15/09/2023 in Belgium, INAGRO organised a company visit to a manure treatment plant in which FER-PLAY results were discussed with participants. It was a joint event with a Flemish demonstration project Boost Pocketvergisting en nabewerking (https://inagro.be/projecten/boost-pocketvergisting-en-nabewerking).

The agenda of the event is presented below in Figure 20.

Figure 20. Agenda of the field trial visit on 15/09/2023 in Belgium

In Figure 21 some photos taken during the company visit on 15/09/2023 are presented.

Figure 21. Photos from the company visit on 15/09/2023 in Belgium

2.9.1. SUMMARY OF THE DISCUSSION

All participants joining the event listened to a presentation on the project and different nutrient recovery techniques and their circular fertilisers, with focus on ammonia stripping, after which a guided tour of the facility and to the ammonia stripping installation was hosted.

2.9.2. RELEVANT OUTCOMES FOR THE PROJECT

The high turnout of participants showed that there is a lot of interest in this nutrient recovery technique and the product (ammonium salts).

During the debate, it became clear that legislation remains a huge barrier to invest in this technique or to use the product. In Flanders, the use of manure and manure-derived products on the field is limited. As animal husbandry is very intensive in Flanders, this limit is already being filled in with raw manure. There is a lot of interest in circular fertilisers, but as long as they need to be used within that same limit, they have no room to use them.

The investment in the ammonia stripping technique is also quite costly. However, for manure processing sites, common in Flanders, the business model would be more profitable than for farms without manure processing facilities.

3. Co-creation events with producers

The fertilisers producers are the second main group of stakeholders to whom FER-PLAY focus their activities. The co-creation events dedicated to them up to now have dealt with two main aspects: (1) the technical, commercial and regulatory barriers for the market uptake of circular fertilisers; (2) the strategies to overcome the social acceptance that circular fertilisers producers found when commercialising their products.

The following table provides the main data related to the commitments from these events and the achievements obtained so far.

Commitment targeting the producers	Deadline	Achieved value (Dec. 23)
4 multi-topic seminars	Aug. 24	1
120 fertiliser producers engaged in seminars	Aug. 24	2
Total number of participants to the seminars (including those beyond targeted stakeholders)	Aug. 24	43
5 focus-groups	April 24	1
10 external stakeholders involved in focus-groups	April 24	8
Total number of participants to the focus groups (including those beyond targeted stakeholders)	April 24	17

Table 13. Commitments linked to the co-creation activities dedicated to circular fertiliser producers

Main outcomes obtained from these meetings with the producers sector reflect the necessity of clarification of some aspects from the legislation, overcoming social acceptance mistrust and making the production cost-effective. The figure of the technical advisor inside the producers staff is highlighted as a key element to improve the relationship with the end-user (overcome the mistrust) and therefore to foster the market. The project guidelines (D3.2) will be designed as a list of key messages resulting from these discussions and aiming to provide producers with instruments to solve the main barriers that they encounter when bringing a circular fertiliser to the market.

As detailed in the previous table, a total of 2 events, organised by EBA (multi-topic seminar in presence inside an European conference) and CIC (online focus group on social acceptance with specifically invited experts previously selected within the list submitted in MS4 “Selection of members for 5 thematic focus groups”), have been carried out, counting with 60 participants in

total. The following sections detail the events features and main outcomes resulting from each of them.

3.1. Event with producers from EU (20/09/2023)

Responsible partner:	EBA
Target public:	Producers, circular fertilisers stakeholders
Type of event:	Multitopic seminar
Modality:	In presence
Joint event with fellow project / FER-PLAY dedicated event:	Joint event with EU project Ferticycle
Main scope:	Discussing technical, commercial and regulatory implications for circular fertilisers at EU regulatory level
Location (Country acronym):	BE
Date (dd/mm/yy):	20/09/2023
Duration (hours):	1 hour 20 minutes
Impact:	43 participants (2 fertiliser producers)

Table 14. Event Main Features (Meeting in Belgium on 20/09/2023)

On 20/09/2023 EBA co-organized with the sister project Ferticycle a workshop at the European Sustainable Nutrient Initiative (ESNI) Conference, held physically in Brussels. The workshop was titled “New bio-based fertilisers from secondary raw material upcycling – technical, commercial and regulatory implications”, being the first multi-topic technical seminar organized withing WP3, with the aim to gather feedback on commercial and regulatory drivers for using and raising awareness regarding circular fertilizers. The workshop consisted of two presentations of the aims and goals of FER-PLAY and Ferticycle projects, followed by 4 short presentations of four different circular fertilisers production (phosphorous fertiliser from wastes, peat-free organo-mineral fertilisers from recyclable bio-waste, struvite and digestate). A final discussion with audience and speakers, involving co-creation tools, was moderated by EBA. The attendance was high.

The agenda of the Event is shown in the following Figure 22.

European Sustainable Nutrient Initiative,

20 September 2023, 09:00 - 17:30 CET

FEB-VBO, Rue Ravenstein 4, 1000, Brussels (BE)

Preliminary Programme

09:00 - 09:30	Welcome and introduction to the ESNI Community by *Prof. Erik Meers, UGhent and Ana Robles Aguilar, BETA- UVIC*
09:30 - 10:30	• Paul Webb, *Head of the European Research Executive Agency, European Commission* • State of play on Fertilising Product Regulation in terms recycled nutrients, *Theodora Nikolakopoulou, DG GROW, European Commission* • Nutrients and their interaction with the environment, *Tue Rasmussen Fosdal, DG ENV, European Commission* • Nutrient (re)cycling in sustainable agriculture, *Luis Sanchez-Alvarez, DG AGRI, European Commission*
10:30 - 11:00	Nutri2Cycle and ReNu2Cycle: policy on bio-based fertilisers, *Prof. Erik Meers, UGent and Laura Van Scholl, NMI*
11:00 - 11:25	Project Pitches and Coffee Break
11:25 - 12:45	Parallel workshops: Session 1

Policy perspective	Technology	Stakeholders perspective
Towards a harmonized approach on sustainability assessment of nutrient recovery pathways: setting LCA methodological priorities *Organised by NOVAFERT*	Technologies for nutrient recovery from wastewater *Co-organised by WALNUT and ULTIMATE*	Profitability and market acceptance of bio-based fertilizers *Co-organised by FERTIMANURE and FERTICYCLE*

12:45 - 13:45	Lunch and poster session

13:45 - 15:05 Parallel workshops: Session 2

Policy perspective	Technology	Stakeholders perspective
New bio-based fertilisers from secondary raw material upcycling – technical, commercial and regulatory implications *Co-organised by FERTICYCLE and FER-PLAY*	Standardise algae circular products to market in agricultural applications *Co-organised by EU4Algae and SEMPRE-BIO*	ReNu2Cycle: Closing the nutrient cycle to provide sustainable, bio-based fertilizer in NWE *Co-organised by ReNu2Cycle*

15:05 - 15:20 Short break

15:20 - 16:40 Parallel workshop: Session 3

Policy perspective	Technology	Stakeholders perspective
Co-creation workshop towards optimizing nutrient flows and budgets in sustainable agriculture: mitigation measures, KPIs and modelling *Co-organised by NUTRIBUDGET and NUTRI2CYCLE*	Bio-based fertilisers recovery from manure and fishery wastes: lessons learnt and future perspectives *Co-organised by FERTIMANURE and SEA2LAND*	Bringing to market high-quality green, healthy food, feed and cosmetics from algae ... with a twist *Organised by ALGAEPROBANOS*

16:40 - 17:20 Wrap up and Plenary Forum of ESNI, *Prof. Erik Meers, UGhent and Ana Robles Aguilar, BETA- UVIC*

17:20 Networking drink

The event is organised by: ESNI

in collaboration with:

Parallel workshops: Session 2

Policy perspective

New bio-based fertilisers from secondary raw material upcycling – technical, commercial and regulatory implications

The workshop will tackle technical, commercial and regulatory implications for selected bio-based fertilisers from secondary raw materials: treated bio-waste, peat-free organo-mineral fertilisers, struvite from industrial and urban waste waters, solid faction of digestate. We will also also address the need for competence-building for researchers, producers, advisors and end-users of new bio-based fertilisers. At the end of the session, speakers will participate in a panel debate to engage with workshop participants in co-creation activities to help assess the situation that bio-based fertilisers' producers and end-users face nowadays.

Moderator: Mieke Decorte, European Biogas Association (EBA)

Speakers:

- Introduction to the FertiCycle Marie S. Curie Training Network, *Lars Stoumann Jensen, Professor, University of Copenhagen, Denmark*
- Introduction to the FER-PLAY project, *Hasler Iglesias Yáñez, CETENMA, Spain*
- Could treated bio-wastes be a sustainable solution to the worldwide need for phosphorous fertiliser, *Pietro Sica, PhD student, University of Copenhagen, Denmark*
- Designing novel peat-free organo-mineral fertilisers from recyclable bio-waste, *Tomas Sitzmann, PhD student, University of Turin, Italy*
- Technical and Commercial challenges for Struvite, *Wim Moerman, Nuresys, Belgium*
- Maximizing Sustainability: Digestate production in the biogas industry, *Marina Pasteris, European Biogas Association (EBA), Belgium*

Technology

Figure 22. Agenda of the part of the meeting dedicated to FER-PLAY on 20/09/2023 in Belgium

In Figure 23 some photos taken during the meeting are presented.

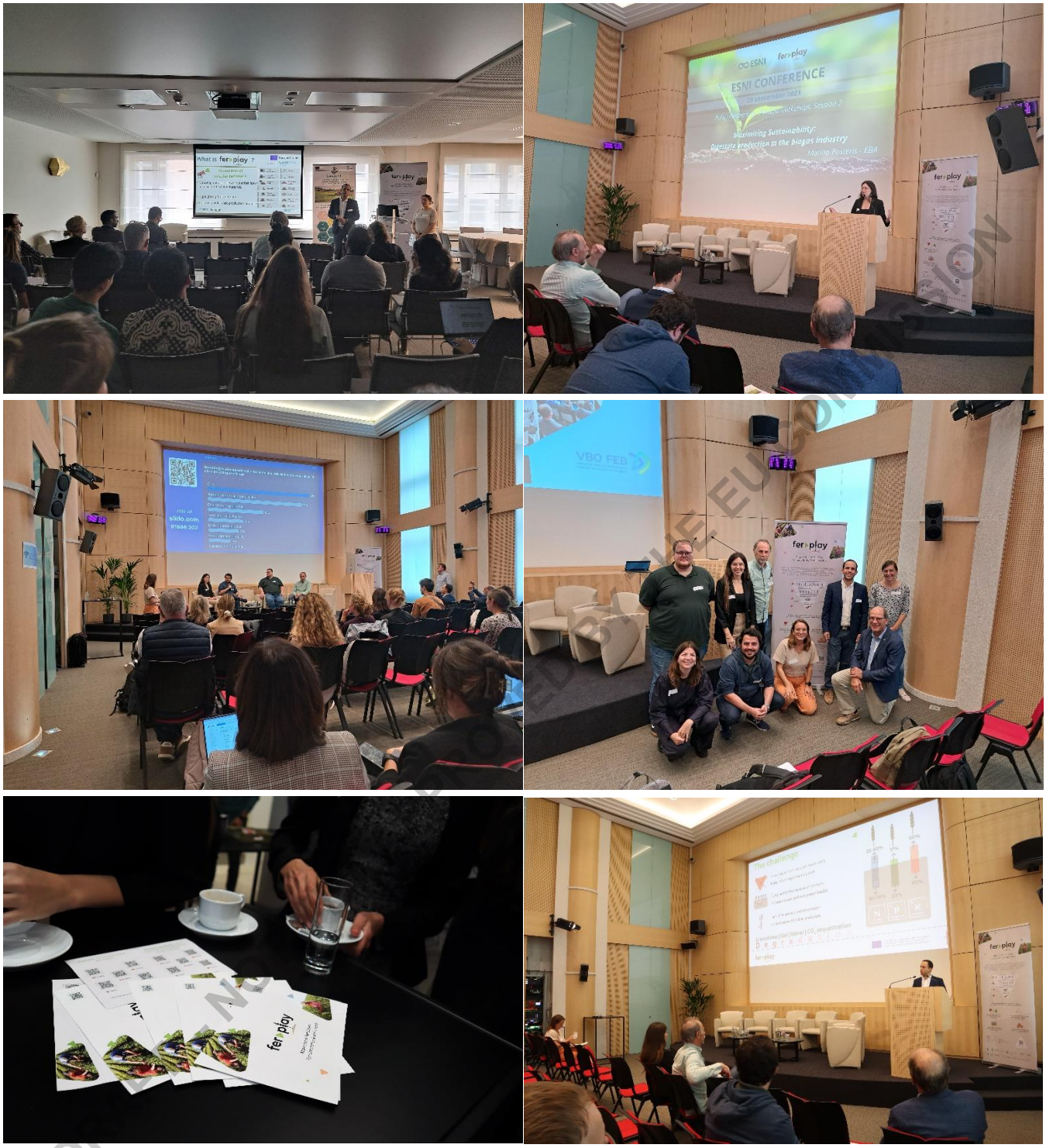


Figure 23. Pictures from the meeting on 20/09/2023 in Belgium

3.1.1. SUMMARY OF THE DISCUSSION

EBA (Mieke Decorte, Technical & Project Manager) welcomed the audience to the workshop co-organized by FER-PLAY and Ferticycle projects. Two short presentations about the two projects co-organizing the workshop were made. CETENMA introduced the overall scope and content of the project. After that, four presentations regarding circular fertilisers were delivered:

Ferticycle (Pietro Sica, PhD student, University of Copenhagen, Denmark) presented technical findings related to treated bio-wastes be a sustainable solution to the worldwide need for phosphorous fertiliser. Highlights of the presentation include:

- Most of the European P demand could be covered with a circular economy approach. We need better allocation and redistribution of resources and to transform these biowastes into efficient biobased P fertilizers.
- In order for P rich biowastes to match the efficiency of mineral P fertilizers, pretreatments such as acidification are required to enhance their P solubility.
- P diffusion when placing digestate solid fraction (DSF) and meat and bone meal (MBM) in the soil were studied. Increase on diffusion after acidification was found.
- Technical challenges regarding the commercialization of these products mentioned the limit on nutrients application because of legislation and the need of further research.

Ferticycle (Tomas Sitzmann, PhD student, University of Turin, Italy) also presented technical and regulatory findings related to novel peat-free organo-mineral fertilisers from recyclable bio-waste. Highlights of the presentation include:

- Bio-wastes have potential to replace peat in OMFs, particularly by analysing their circular value.
- Low organic C influences mineral P rather than mineral N.
- Bio-waste organo-mineral fertilisers are not recommendable for short-growing crops.
- Bio-waste organo-mineral fertilisers may increase ammonia losses due to high pH.
- Further/circular processing may be necessary in biowaste to increase their efficacy.

NuReSys presented technical challenges and opportunities for struvite originated from urban and industrial wastewater, two of the seven value chains selected in FER-PLAY. Highlights of the presentation include:

- Struvite technology is well established mainly municipal / few industrial applications.

- Though challenge is in producing MARKET PULL product: size / morphology / hardness = UNIFORMITY
- Post processing will be key = grinding / additives / re-granulation / biological activation.
- Centralization of the produce for effective sales.
- Need of uniform legislation EU wise
- Increase economy of scale to obtain Market Pull Product = uniform product in large quantities = N-P-Mg source

FER-PLAY (EBA) presented technical, commercial and regulatory challenges and opportunities for the digestate. There are many various for the commercialisation or application of digestate depending on the feedstock used. Highlights of the presentation include:

- 27.1 Mt (dry basis) of digestate were produced in Europe in 2021.
- Digestate can already displace: 13.4% Nitrogen-based synthetic fertilizers (Haber–Bosch-derived), 9.4% phosphorus fertilizers and 5.1% potassium fertilizers.
- 8.8 Mt of CO_2 equivalent savings could be obtained when replacing synthetic nitrogen fertilisers with digestate in 2021 in Europe.
- Digestate has numerous applications and novel uses.
- Principal challenges are technology development for circular uses of digestate and legislative frameworks.

After the presentations, a panel discussion including interactions with audience and speakers was conducted. The audience was invited to interact via Sli.do as part of the technical discussion.

Question 1: According to your experience, choose the most relevant factors when selecting a fertiliser: (max 3)

- Form (e.g. solid, liquid)
- Ease of use / application
- Currently used machinery
- Nutrient content and composition
- Cost

- Environmental aspects
- Production sustainability

To speakers: How does your circular fertilizer stand in relation to these 3 most mentioned factors (result 1, result 2, result 3)? Can you think on one extra attractive property or impact of your circular circular fertilizer for farmers / end-users?

Question 2: Select 3 most relevant commercial difficulties that you consider important to tackle for allowing the commercialization of circular fertilizers.

- Legislation
- Social acceptance
- Availability (locally or regionally)
- Cost
- Lack of subsidies
- Lack of scientific evidence
- High rigorous quality standards

To speakers: Can you name one commercial difficulty that you consider important to tackle for allowing the commercialization of the circular fertilizer?

Question 3: What are, according to you, the biggest legislative barriers for usage of circular fertilizers?

To speakers: What are the biggest challenges that your presented circular fertilizer faces in terms of legislation?

Question 4: How to overcome barriers in terms of legislation related to circular fertiliser?

To speakers: How to overcome barriers in terms of legislation related to your circular fertiliser?

The list of attendees showed that the audience was split between researchers, fertiliser producers or other types of stakeholders (biogas sector and associations), including policy makers.

Results of the Sli.do are shown in the following Figure 24 and Figure 25. In summary, most relevant factors when selecting a fertiliser are cost, nutrient content and composition, ease of use/application, environmental aspects. The 3 biggest commercial difficulties were without

surprise: legislation by far, cost and social acceptance. The biggest legislative barriers mentioned: RENURE/Nitrate Directive as the main selected barrier and end-of-waste criteria.

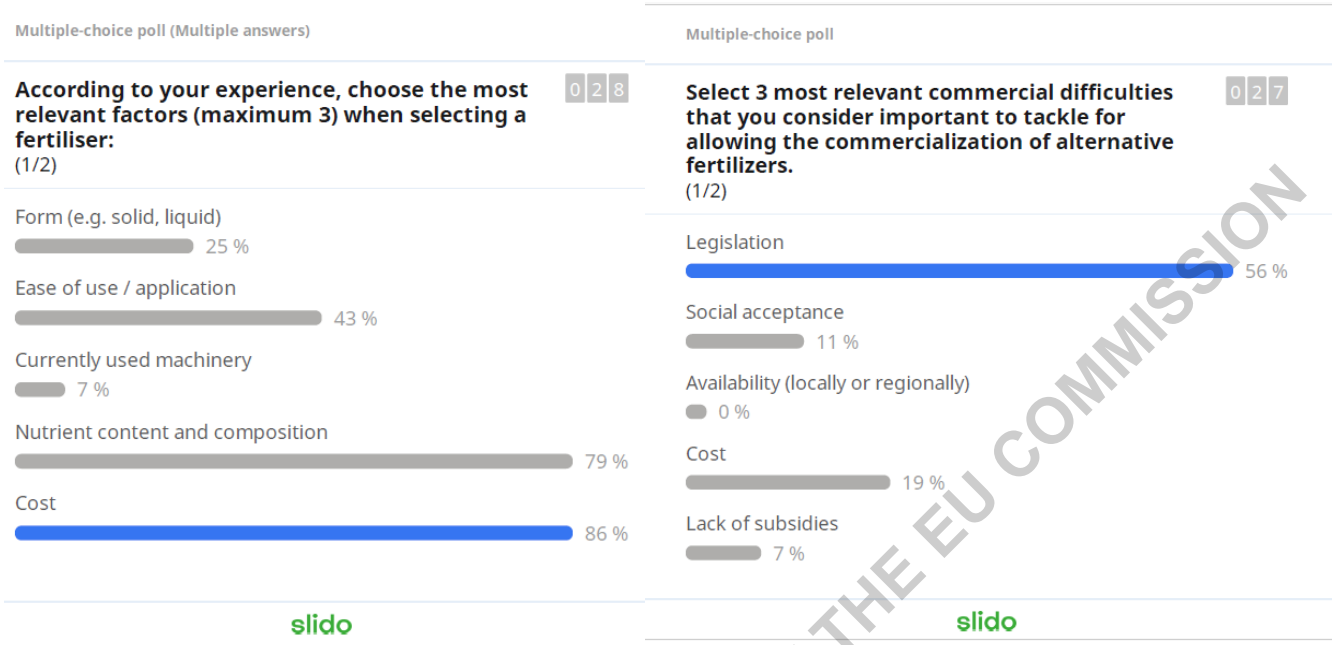


Figure 24. Results of Question 1 (left) and Question 2 (right)

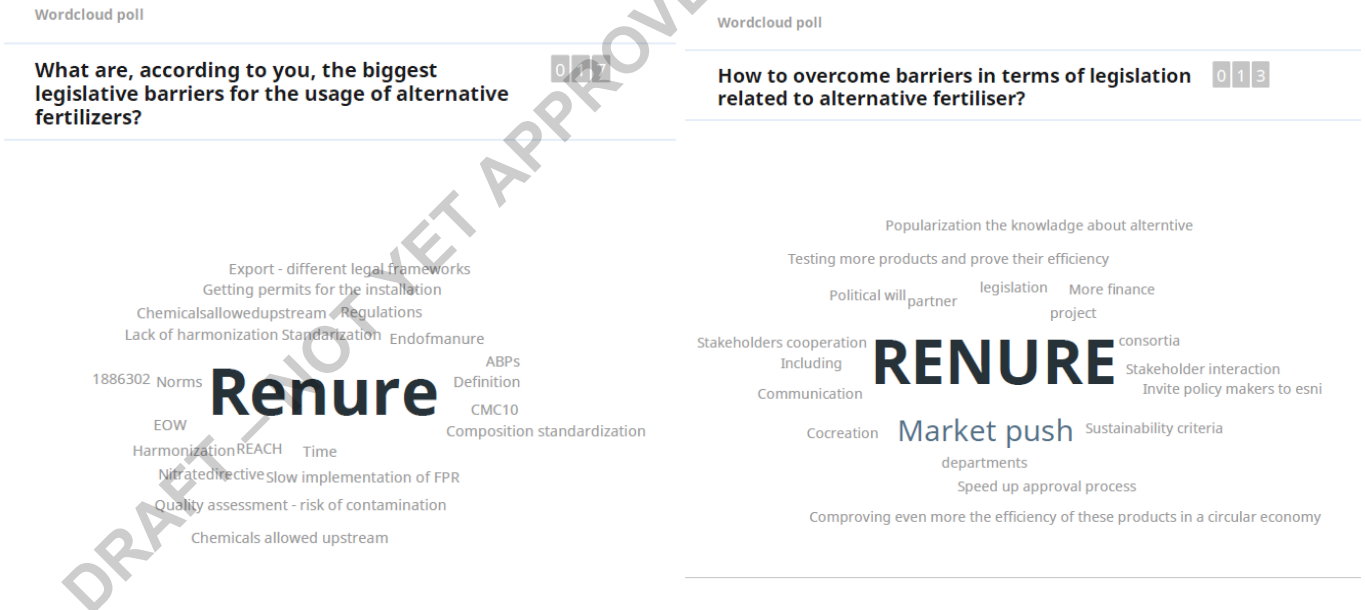


Figure 25. Results of Question 3 (left) and Question 4 (right)

3.1.2. RELEVANT OUTCOMES FOR THE PROJECT

- According to the debate these are the main outcomes of the event:

- Most relevant factors when selecting a fertiliser are: cost, nutrient content and composition, ease of use/application, environmental aspects.
- There are three most barriers for commercialization of circular fertilisers are: legislation by far, cost and social acceptance.
- The biggest legislative barriers mentioned are RENURE/Nitrate Directive and the End-of-Waste criteria.
- Incentives are important to foster the deployment of circular fertilisers (CAP, financial incentives, other targets for recovery of nutrients, they do exist sometimes at national level).
- Awareness raising to policy makers is needed.

3.2. Event with producers from EU (14/12/2023)

Responsible partner:	CIC
Target public:	Producers, end-users, public administration, citizenship
Type of event:	Focus Group
Modality:	Online meeting
Joint event with fellow project / FER-PLAY dedicated event:	FER-PLAY dedicated event
Main scope:	Discussing social acceptance barriers when marketing circular fertilisers
Date (dd/mm/yy):	14/12/2023
Duration (hours):	2 hours
Impact:	17 participants (8 external stakeholders)

Table 15. Event Main Features (Meeting on 14/12/2023)

On the 14/12/2023, CIC organised a Focus Group with external stakeholders dedicated to the discussion about the social acceptance of circular fertilisers. The event was designed as an open round table moderated by CIC of 2 hours duration. The stakeholders invited were representing the main groups “influencing” the social acceptance of circular fertilisers (end-users, producers, public administration/control bodies, civil society). In Figure 26 some pictures taken during the online meeting are represented.

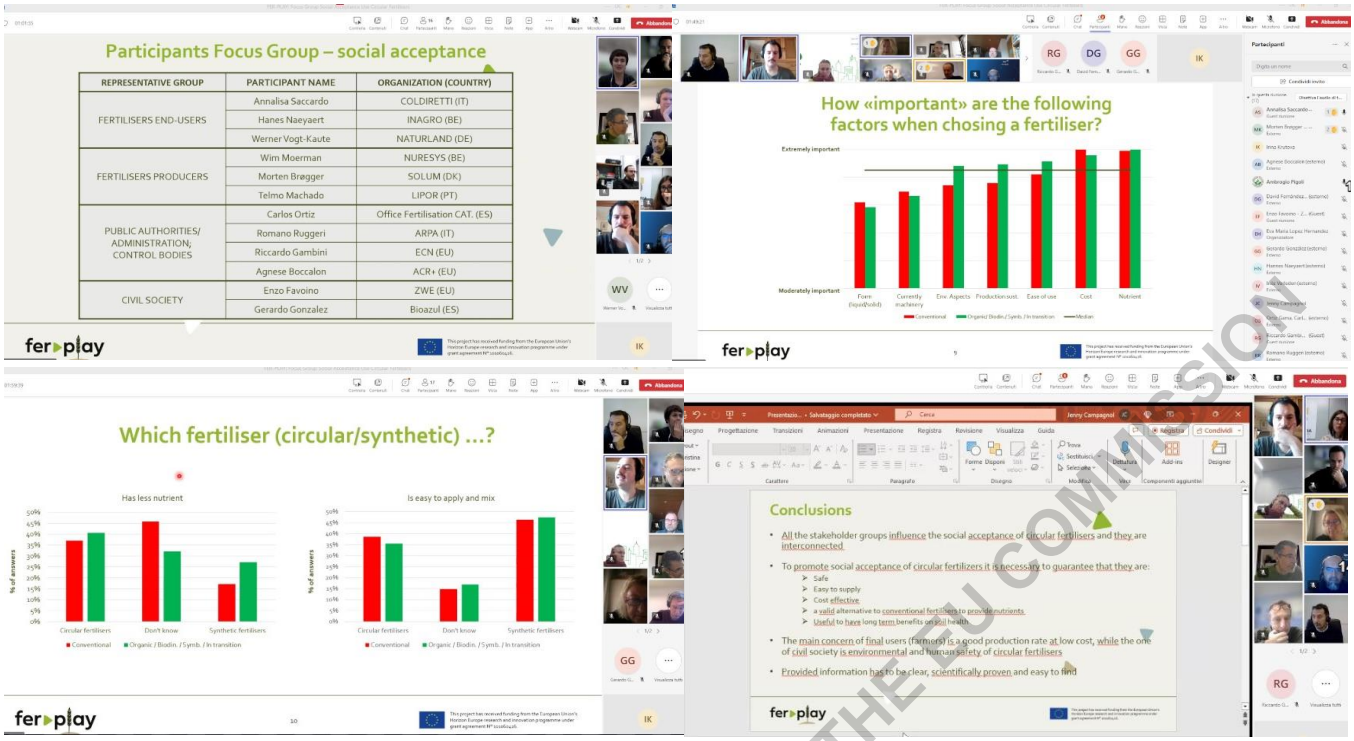


Figure 26. Pictures from the meeting on 14/12/2023

3.2.1. SUMMARY OF THE DISCUSSION

After a brief introduction of CIC, the project and the reason why co-creation events are part of the activities of FER-PLAY, the moderator launched the initial premises to focus the discussion:

- Focus on the elements of social mistrust that outweigh the benefits that the circular fertilisers provide to the soils and the environment.
- Discussion on the barriers but also possible ways to overcome them.
- Limit the discussion to the product (not to production site and NIMBY syndrome).
- Different target groups involved -> Highly interconnected
    - Fertiliser end-users
    - Fertiliser producers
    - Public authorities/administrations/control bodies
    - Civil Society

The last premise gave the floor to the presentation of the speakers invited (meanwhile a table with all names and target group represented was shown), highlighting clearly their connection with the circular fertiliser issue.

The discussion started once the moderator was showing the slides containing the different results obtained in the surveys performed within WP2 “Multi-assessment of impacts, trade-offs and framework conditions of selected alternative fertiliser value chains” dedicated to end-users, producers and public administration. The main topics opened to the discussion with the stakeholders invited were:

- The trust that end-users have in technical advisors as source of information and the importance of their training and update on new fertilisers (like the circular ones).
- While conventional fertilisers producers do count with an agronomist in their staff dedicated to the relationship with the end-user, this is not always the case in the producer of the circular fertiliser.
- The acceptance to the use of circular fertiliser shown by the end-users seems to be strictly linked to the low costs of the product and the high availability of nutrients; more interest on immediate results than on the long term of soil health.
- The end-users do not consider (or they do not know) that the synthetic fertilisers are the ones presenting a higher nutrient content. The end-users do not consider the distribution of circular fertilisers as a barrier. Notwithstanding, the market of circular fertilisers in EU is not fully deployed.
- The strategies that the EU is putting in place to enhance the acceptance to circular fertilisers. The role of incentivation as the only possible mechanism to overcome this mistrust.

3.2.2. RELEVANT OUTCOMES FOR THE PROJECT

The main conclusions obtained in the discussion are summarised below:

- All the stakeholder groups influence the social acceptance of circular fertilisers and they are highly interconnected.
- To promote social acceptance of circular fertilisers it is necessary to guarantee that they are:
    - Safe
    - Easy to supply
    - Cost effective
    - A valid circular to conventional fertilisers to provide nutrients
    - Useful to have long term benefits on soil health
- The main concern of end-users (farmers) is a good production rate at low cost (immediate results), while the one of civil society is environmental and human safety of circular fertilisers (long-term). The Soil Law is not as ambitious as it could have been.

- Provided information has to be clear, scientifically proven and easy to find.
- A technical advisor is a professional figure extremely important to convey information to end-users.
- To improve the current situation on the use of circular fertilisers is useful:
  - A close relationship with the end-user – technical advisor (provide information and support).
  - Training to end-users is essential to overcome uncertainty that generates mistrust (differences between fertilisers, rate and type of nutrients, how to use them).
  - The importance of QAS (quality assurance scheme) to guarantee the quality of the product (better if impurities and contaminants levels are even more restrictive than the ones from the current regulations in force).
  - The development of local markets are important (so farmers know where to buy circular fertilisers).
  - Important to provide information on the differences among the circular fertilisers and on the diverse effect that the different recycling processes have on the agronomic characteristics and environmental impacts.

4. Co-creation events with public administration

Public administrations have an essential role on the promotion of the production and use of circular fertilisers in their territory, and so they have been considered an important group to be involved within project co-creation events.

Discussions with this group have included two main topics: (1) the sharing of best practices among them, which may have an effect on those who are aiming to put in place a strategy to trigger the deployment of these fertilisers; (2) a dialogue on the main regulatory barriers that currently hinder the development of the market for circular fertilisers.

Main outcomes from the discussions will be included in the guidelines (D3.3) to be elaborated by FER-PLAY project targeting the public administrations and to the assessment of the Regulatory Framework to be performed in WP2 “Multi-assessment of impacts, trade-offs and framework conditions of selected alternative fertiliser value chains”.

The following table provides the main data related to the commitments from these events and the achievements obtained so far.

Commitment targeting the policy-markers	Deadline	Achieved value (Dec. 23)
2 working-groups with administrations	Aug. 24	1
5-10 administrations invited to the working group	Aug. 24	5
Participants to the working group (including those beyond the administrations)	Aug. 24	38
3 online meetings with stakeholders	Aug 24	2
Participants to the online meetings	Aug 24	100
30 members participating in a final workshop	Aug 24	-

Table 16. Commitments linked to the co-creation activities dedicated to circular fertiliser producers

As detailed above, the project has so-far organised 3 co-creation events thanks to the efforts of partners EBA and ACR+, gathering a total of 138 participants into discussions. The following sections detail the main features and outcomes resulting from each of them.

In addition, it should be highlighted that an online platform will be available inside FER-PLAY website to gather the feedback from the public administration. Its elaboration is currently under process.

4.1. Event with stakeholders from EU (18/09/2023)

Responsible partner:	EBA
Target public:	Policy officers from EU organizations, researchers
Type of event:	Meeting
Modality:	Online
Joint event with fellow project / FER-PLAY dedicated event:	FER-PLAY dedicated event
Main scope:	Discussing challenges and opportunities for circular fertilisers at EU regulatory level
Date (dd/mm/yy):	18/09/2023
Duration (hours):	1 hour
Impact:	51 participants

Table 17. Event Main Features (Meeting on 18/09/2023)

The first session of the event entitled "Towards the co-creation of better regulation frameworks for circular fertilisers" was held online on 18/09/2023.

The agenda of the Event is shown in the following Figure 27.

Towards the co-creation of better regulation frameworks for alternative fertilisers

Organised by FER-PLAY

Programme

18 & 28 September 2023 – Via Microsoft Teams

FER-PLAY aims at facilitating the uptake of alternative fertilisers to protect ecosystems, decrease EU dependence on fertiliser imports, foster circularity, and improve soil health. The project will map and assess alternative fertilisers made from secondary raw materials, such as manure, and highlight their multiple benefits in order to promote their wide-scale production and use on field.

As a first step in the project, seven alternative fertiliser value chains have been selected based on a multi-assessment analysis: struvite from urban wastewater, struvite from industrial wastewater, stabilized sludge, composted bio-waste, feather meal, solid fraction of digestate and champost. Now, two online meetings will be organized to discuss regulatory challenges and opportunities faced by the selected products. Conclusions drawn from the meetings will help to elaborate policy recommendations to contribute to favourable regulatory conditions for the uptake of these alternative fertilisers.

Hour	Activity
Day 1: Monday 18 September 2023 - Regulatory challenges and opportunities for sludge-derived fertilising products	
13:00 – 13:05	**General introduction and welcome** • **Lucile Sever**, Policy Officer, EBA
13:05 – 13:15	**FER-PLAY: facilitating the uptake of alternative fertilisers for circularity & soil health** • **Martin Soriano**, R&D Project Coordinator, CETENMA – Coordinator of FER-PLAY
13:15 – 13:45	**Regulatory challenges and opportunities** • *Struvite from urban wastewater and industrial wastewater* by **Wim Moerman**, Dr.ir. process engineer, NuReSys • *Stabilized sludge* by **Elisa Gambuzzi**, R&D Technician, CETENMA
13:45 – 13:55	**Q&A** • Moderator: **Lucile Sever**

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement N° 101060426.

Figure 27. Agenda of the meeting on 18/09/2023

In Figure 28 some screenshots taken during the online meeting are presented.

Figure 28. Screenshots from the meeting on 18/09/2023

4.1.1. SUMMARY OF THE DISCUSSION

EBA introduced the meeting's content: one of the projects' goals is to co-create a better regulatory framework for a set of circular fertilisers. External stakeholders were invited to interact via Sli.do during the meeting, which was managed by CIC. The Sli.do poll showed that most of the participants were researchers or other types of stakeholders (biogas sector, water and wastewater sector, farmers associations, etc.). It appears that many participants were actually potential fertilisers producers even if they might not identify as such and policy officers from industry associations at national and EU level.

Three presentations from FER-PLAY partners were delivered:

- CETENMA introduced the overall scope and content of the project. The Sli.do poll indicated that the majority of the participants were aware of administrative/regulatory barriers for the deployment of circular fertilisers in general but not necessarily for the deployment of struvite and stabilized sludge.

- NuReSys presented regulatory challenges and opportunities for struvite originated from urban and industrial wastewater, two of the seven value chains selected in FER-PLAY. Regarding the legal framework, the Fertilising Products Regulation 2019/1009 provided an end-of-waste status to struvite but there are remaining regulatory barriers resulting from specificities in different EU countries. The majority of participants considered, based on the Slido poll, that the Fertilising Product Regulation had mostly created a confident framework for the market uptake of struvite.

- CETENMA presented regulatory challenges and opportunities for stabilised sludge (that has undergone a biological, chemical or heat treatment) in agriculture. Compost and digestate from sewage sludge is still not covered by the Fertilising Products Regulation. The main barrier to sewage sludge application in agriculture is Directive 86/278/EEC. The Sli.do poll indicates that circa half of the audience knew about the revision of this Directive, and the other half was not aware.

EBA moderated the Q&A session, participants were active. Speakers answered to the following questions during the session:

- How can we create a 'pull' factor in the market, i.e. demand for sludge-derived fertilisers when they are not price-competitive? NuReSys suggested to have a regulatory incentive for recycled nutrients in the composition of fertilising products or a tax relief. CETENMA indicated that, before even questioning the marketability of sludge-derived fertilisers, it is important to avoid the preclusion of the application of sewage sludge as part of the revision of the Sewage Sludge directive while guaranteeing the safety of the soils and consumers.

- Is there a reason why regulations and directives are so strict in regard to sewage sludges? CETENMA indicated that pathogens, contaminants as heavy metals, antibiotics concentrate in sewage sludges so it is necessary to limit the concentration of contaminants. Nevertheless, wastewater treatment plants need to be in condition to create sewage sludges that comply with new regulations. These conditions can be enabled by financing new treatment lines that are more technologically advanced.

- Considering the technological units needed to obtain a high purity struvite, particularly when sludge is used as feedstock, is it still cost-effective? NuReSys highlighted that the struvite technology should be used for phosphorus control and the production of end-product struvite should only be considered an added value. Implementing struvite technology just for the revenue of selling the product is economically difficult.

- There are some highly stressed areas in which manure or digestate from biowaste are preferred for agriculture rather than sludge. In those locations, what are the circulars for sludge? NuReSys answered that there is indeed a competition for the application of manure or sewage-derived fertilisers on those lands.

The Sli.do poll indicated that most of the participants believe that the main regulatory barrier for the uptake of circular fertilisers is the lack of recognition or difficult requirements in the Fertilising Products Regulation.

ACR+ thanked the participants and closed the meeting. Regarding policy incentives at EU level, the last Sli.do poll indicated that participants would support two solutions: rewarding the use of circular fertilisers through dedicated funding in the Common Agricultural Policy and incentivising the recycling of certain inputs materials to be used as circular fertilisers (e.g. biowaste).

4.1.2. RELEVANT OUTCOMES FOR THE PROJECT

Below some relevant outcomes for the project are presented:

- The sludge-derived circular fertilisers presented during the meeting generated a lot of interest from participants. Yet, major regulatory barriers are still hampering the uptake of these products.
- The main regulatory barrier according to the speakers and the participants appears to be the Fertilising Products Regulation even if it only restricts the marketability of the products, not their direct application. It might be relevant to elaborate a specific policy recommendation dedicated to barriers in the Fertilising Products Regulation.

4.2. Event with stakeholders from EU (28/09/2023)

Responsible partner:	EBA
Target public:	Policy officers from EU organizations, researchers
Type of event:	Meeting
Modality:	Online
Joint event with fellow project / FER-PLAY dedicated event:	FER-PLAY dedicated event
Main scope:	Discussing challenges and opportunities for circular fertilisers at EU regulatory level
Date (dd/mm/yy):	28/09/2023
Duration (hours):	1 hour

Impact:	49 participants

Table 18. Event Main Features (Meeting on 28/09/2023)

The second session of the event entitled "Towards the co-creation of better regulation frameworks for circular fertilisers" was held online on 28/09/2023.

The agenda of the Event is shown in the following Figure 29.

Towards the co-creation of better regulation frameworks for alternative fertilisers

Organised by FER-PLAY

Programme

18 & 28 September 2023 – Via Microsoft Teams

FER-PLAY aims at facilitating the uptake of alternative fertilisers to protect ecosystems, decrease EU dependence on fertiliser imports, foster circularity, and improve soil health. The project will map and assess alternative fertilisers made from secondary raw materials, such as manure, and highlight their multiple benefits in order to promote their wide-scale production and use on field.

As a first step in the project, seven alternative fertiliser value chains have been selected based on a multi-assessment analysis: struvite from urban wastewater, struvite from industrial wastewater, stabilized sludge, composted bio-waste, feather meal, solid fraction of digestate and champost. Now, two online meetings will be organized to discuss regulatory challenges and opportunities faced by the selected products. Conclusions drawn from the meetings will help to elaborate policy recommendations to contribute to favourable regulatory conditions for the uptake of these alternative fertilisers.

Hour	Activity
Day 2: Thursday 28 September 2023 - Regulatory challenges and opportunities for various fertilising products	
13:00 – 13:05	**General introduction and welcome** • **Lucile Sever**, Policy Officer, EBA
13:05 – 13:15	**FER-PLAY: facilitating the uptake of alternative fertilisers for circularity & soil health** • **Martin Soriano**, R&D Project Coordinator, CETENMA – Coordinator of FER-PLAY
13:15 – 13:45	**Regulatory challenges and opportunities** • *Composted bio-waste from food waste and green compost* by **Ambrogio Pigoli**, Technical expert, CIC • *Feather meal* (tbc.) • *Solid fraction of digestate* by **Lucile Sever**, Policy Officer, European Biogas Association • *Champost* by **Kristof Gheysens**, Researcher, Inagro
13:45 – 13:55	**Q&A** • Moderator: **Lucile Sever**
13:55 - 14:00	**Closure** • **Lauriane Noirot**, Project Officer, ACR+ – Task Leader FER-PLAY

fer▸play

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement N° 101060426.

Figure 29. Agenda of the meeting on 28/09/2023

In Figure 30 some screenshots taken during the online meeting are presented.

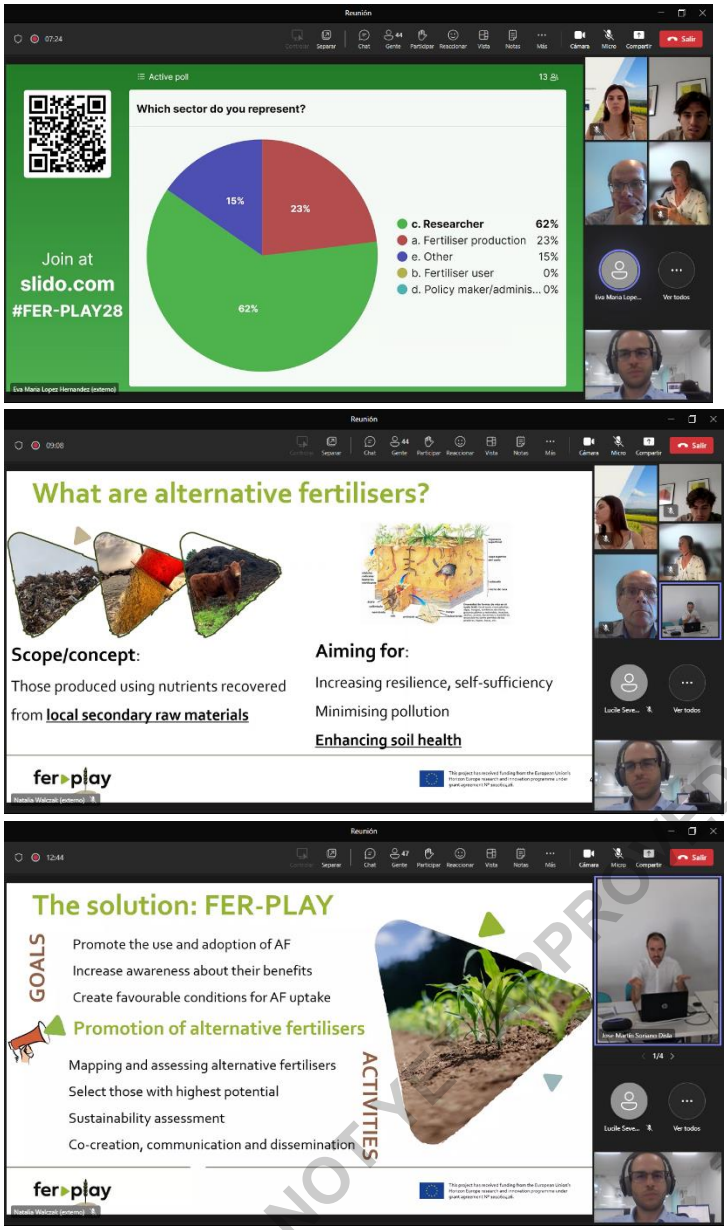


Figure 30. Screenshots from the meeting on 28/09/2023

4.2.1. SUMMARY OF THE DISCUSSION

EBA welcomed the audience to the second online meeting of FER-PLAY project presenting the agenda.

External stakeholders were invited to interact via Sli.do during the meeting, which was managed by CIC. The Sli.do poll showed that the audience was split between researchers, fertiliser

producers or other types of stakeholders (biogas sector and associations). Again, many policy officers from industry associations at national and EU level were present.

Four presentations from FER-PLAY partners were delivered:

- CETENMA introduced again the overall scope and content of the project. The slido poll indicated that the majority of the participants were aware of administrative/regulatory barriers for the deployment of circular fertilisers in general but most of them were not aware barriers for the specific deployment of struvite and stabilized sludge.
- CIC presented regulatory challenges and opportunities for composted bio-waste from food and green waste. Compost is included in the Fertilising Products Regulation (inside classification PFC 3.A and CMC 3) but there are still discrepancies. The other main barrier is in the Animal By-Products Regulation. In the Sli.do poll, participants were split with regards to the possibility to produce compost with a CE mark in compliance with the FPR: some believe it will be possible, some think it will not be possible due to both technical and administrative issues or only due to administrative issues.
- CIC also presented regulatory challenges and opportunities for feather meal which main barrier is that even if covered by the Fertilising Products Regulation (classification PFC 1.A.I and CMC 1), an end-point is still lacking and restraining feather meal to be commercialized under CMC 10.
- EBA presented regulatory challenges and opportunities for the solid fraction of digestate. There are many various for the commercialisation or application of digestate depending on the feedstock used. Solid fraction of digestate is included in the Fertilising Products Regulation (PFC 1.A.I. or PFC 3.A, CMC 4 or 5) but there are still a lot of requirements that are impossible to meet. The Soil Monitoring Law is a good opportunity to promote the application of circular fertilisers, including digestate, as a sustainable soil management practice to be implemented at member state level. According to the Slido poll, participants believe that, with regards to digestate, priority should be given to tackling the remaining barriers for digestate in the Fertilising Products Regulation.
- INAGRO presented regulatory challenges and opportunities for Spent Mushroom Substrate (SMS) from Agaricus bisporus production. Under the Fertilising Products Regulation, SMS should be recognized under PFC 3.A (or PFC 4). Organic Soil Improver and CMC 10. However, an end-point is still lacking. The Slido poll indicates that participants believe that the recognition of SMS as an organic soil improver (PFC3A) will definitely give a boost to the commercialization of this product.

Speakers answered to the following questions during the Q&A session moderated by EBA:

- Regarding CMC 3: COMMISSION DELEGATED REGULATION (EU) 2023/1605 of 22 May 2023 article 3 (c) defined the end-point for animal by-products based compost (given pasteurization is done). Has this not solved the issue of animal by-products used as compost raw material? CIC indicated that for composting plant, it is not common to have pasteurization, so there is still a major barrier. EBA indicated that for digestate, it is similar to compost, and with the new regulation, animal by-products could be included in component materials (CMC 5 for digestate). But it is still not clear if the Fertilising Product Regulation needs to be amended to reflect this new delegated regulation.

- Regarding selection of a PFC. If PFC 1 (A)(I) is hard to achieve with digestate alone, why not aim at PFC 1 (B) (I) and produce an organo-mineral fertiliser instead? That would require to upgrade with mineral fertilizers, but the obtained product may gain higher commercial and agronomical value? EBA answered that PFC 1. B is also an option for digestate producers. Nevertheless, there is a tendency at political level to support more and more the production of organic fertiliser (in Soil Monitoring Law, Common Agricultural Policy), this would not apply to organo-fertilisers.

- Gypsum is one of the input to SMS. Phospho-gypsum is a residue from fertiliser production, can that be used (or is it already used)? Most of the gypsum used in the Mushroom industry comes from the plastic board industry. For the phospho-gypsum, its applicability will depend also on prices.

- What do you understand under composted biological by-products? Why do you speak about biothermal drying, when you speak about composting? Biological By-products is another value chain; it comes from the agri-food industry. During bio-composting phase, the degradation of organic matter leads to a huge increase in temperature, this is the reasoning for biothermal drying.

According to the Sli.do polls, participants consider that the most restrictive regulatory barrier for the uptake of circular fertilisers is the restriction on the input materials to use in circular fertilisers (CMC) and the most important policy incentive is through the Common Agricultural Policy (followed closely by the incentivization of recycling, e.g. biowaste).

EBA thanked the participants and closed the meeting.

4.2.2. RELEVANT OUTCOMES FOR THE PROJECT

Below some relevant outcomes for the project are presented:

- Again, the circular fertilisers presented during the meeting generated a lot of interest from participants. Yet, major regulatory barriers are still hampering the uptake of these products.

- A common regulatory barrier according to the speakers and the participants is again the Fertilising Products Regulation.

4.3. Event with public administration from EU (07/11/2023)

Responsible partner:	**ACR+**
Target public:	Regional Public Administration (but the meeting was open to all interested stakeholders)
Type of event:	Working group
Modality:	Online
Joint event with EU project /FER-PLAY dedicated event:	Several EU projects were invited to present: Novafert, CCRI, HOOP
Main scope:	To discuss best practices on the promotion of production/use of circular fertilizer + to gather information for the development of the policy briefs
Date (dd/mm/yy):	07/11/23
Duration (hours):	2.5 hours
Impact:	38 participants (5 local administrations)

Table 19. Event Main Features (Meeting on 07/11/2023)

A working group with representatives of Regional Public Administrations was organised online on 07/11/2023. Some CCRI Pilot members (Castilla y León) and sister European projects were invited to the event in order to present their Best Practices: Novafert – Enhancing the use of circular fertilizers, CCRI (Circular Cities and Regions Initiative) - Supporting Europe's circular economy at local and regional level, HOOP - Vitalise Europe's Urban Bioeconomy.

The agenda of the Event is shown in the following Figure 31.

Figure 31. Agenda of the working group on 07/11/2023

In Figure 32 some screenshots taken during the online working group are presented.

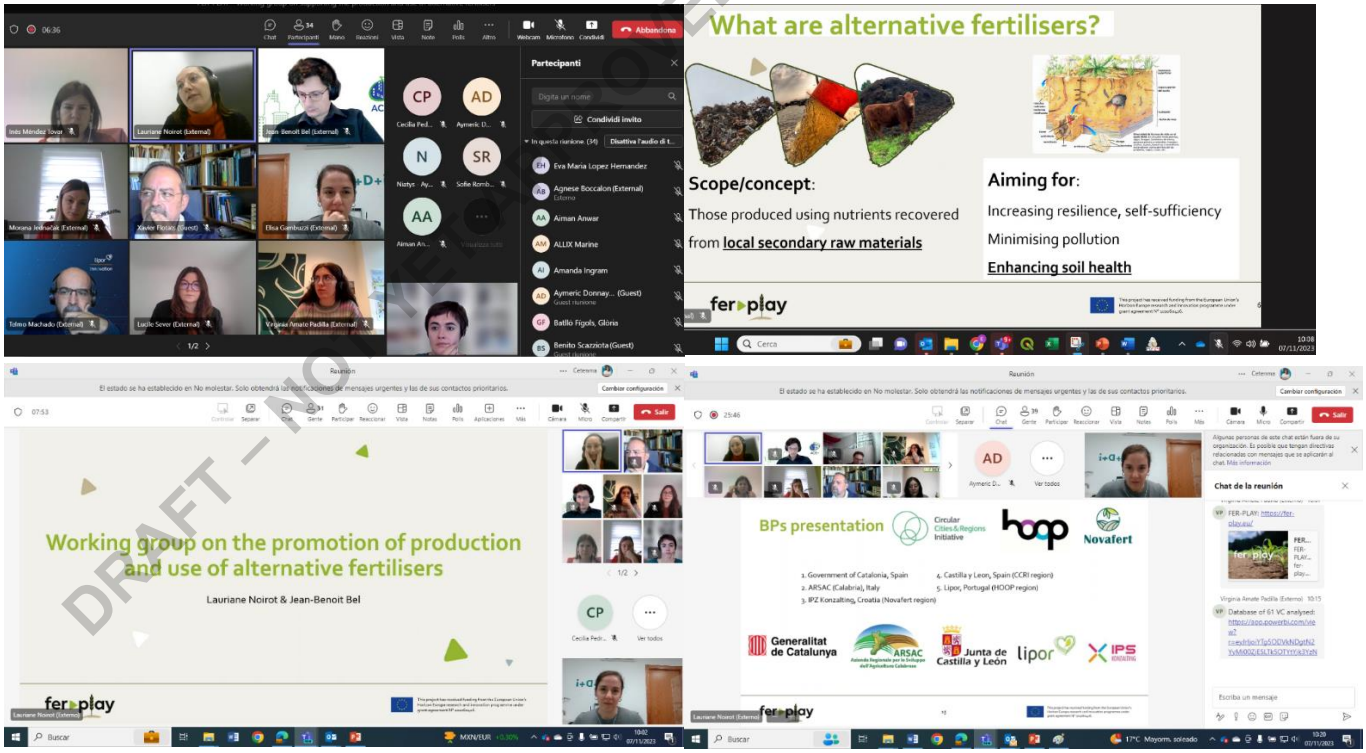


Figure 32. Screenshots from the online working group on 07/11/2023

4.3.1. SUMMARY OF THE DISCUSSION

The presentations of some Best Practices during the online working group.

- Catalonian biogas strategy involves the Waste Agency, together with the Energy and Agriculture Departments of the Region of Catalonia. Governance is made by the board of directors from different agencies/department, including citizens and farmers representatives. The focus is to do bio-fertilisers with different feedstock: bio-waste, manure, etc. mainly in N surplus areas. Some barriers were presented: (1) Confusing EOW (End-of-waste) criteria: adapt/clarify regulation; (2) Business model and economic balance: economic instruments to producers and users; (3) Process phase separation for digestate and then promotion of (liquid) digestate.

- The Agency for Agriculture development in Calabria Region has signed a framework programme to ensure the circularity of bio-waste in the Region. Two main actions are part of it: the monitoring of soil organic matter and nutrients in a detailed way from many years (in line with the future EU Soil Monitoring law) and the technical support to the bio-waste recycling sector to improve their recycling efficiency into high quality compost. The strategy of the Region involves collaboration with private entities (like the bio-waste recycling plants, the Italian Composting and Biogas Consortium, the farmers, the main farmers Association). Barriers are mainly financial, information/awareness and training.

- Croatia experience is considered a good practice because of stakeholder engagement, knowledge sharing and support to farmers. Barriers are: lack of information or access to info (older farmers), traditional practices, variability of soil, restrictive regulation, lack of support for users.

- Castilla-Leon (CCRI) strategy is based on the collaboration of the Environment Ministry, a fertiliser company, researchers, farmers through cooperatives. The barriers are: the low density, long distances for biowaste (decentralised management is the option), the regulation on ashes and on land use (long-time procedures), the fact that farmers prefer synthetic fertilisers (easier, bad past experience with sludge or low quality compost).

- LIPOR (Oporto Waste Management Company, participating to HOOP project) started in 1982 with already a brand “Fertor”, but it was coming from MBT (Mechanical–Biological Treatment), so the quality was low. Later a plant focusing on high-quality compost was designed, producing about 9,000 ton/year of compost “Nutrimais”. Barriers are still present along the value chain (collection, treatment with too many regulatory bodies, end-use: perceived as low-value product + acceptance)). They are carrying out a project of nutrient extraction from digestate + biochar.

In the second part of the online working group, there was a session dedicated to Questions and Answers where the most interesting points highlighted were the following:

- Subsidies for production plants are useful to bring prices down but also environmental labels for farmers can foster the change.
- Marketing of these circular fertilisers is a big challenge.

The Questions and Answers session was followed by the Interactive session which included some pools to which the participants were asked to answer.

The first poll was about the possibility of replication of Best Practices presented. 73% answered that the replication was possible; 6% assumes it is not possible to replicate; and about 20% answered that there was a need for more information in order to answer.

Then the participants who answered "Yes" to the first poll were asked why they supposed so. The answers were balances, generally the participants supposed that it was easy to adapt the local strategy to do.

4.3.2. RELEVANT OUTCOMES FOR THE PROJECT

The relevant result for the project of the online working group on 07/11/2023 consisted in the identification of useful/interesting Best Practices that could be used in the practical recommendations D3.3.

On of the polls launched during the discussion was about the preferred topics to be addressed in the practical recommendations D3.3. the results of this poll are presented in the following Figure 33.

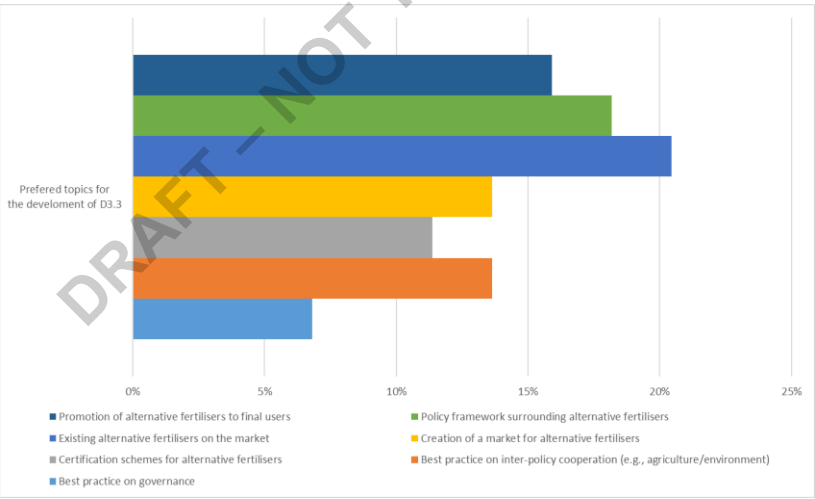


Figure 33. Results of the poll about the preferred topics for the development of D3.3

5. Summary and conclusions

This report includes the main outcomes obtained from the 14 co-creation events organised by project partners from March 2023 to December 2023 to collect feedback on the barriers and opportunities for the deployment of the circular fertilisers market in Europe.

The main outcomes resulting from the co-creation activities are included in Table 20 and represent valuable inputs, as they represent first-hand perspectives from external stakeholders, for the rest of activities carried out by the project, from the multi-assessment of impacts and trade-offs derived by circular fertilisers, social acceptance and regulatory barriers evaluation (WP2 "Multi-assessment of impacts, trade-offs and framework conditions of selected alternative fertiliser value chains"), to the messages to be displayed within the 3 tailor-made guidelines (D3.1-D3.3) and also including the awareness raising campaigns (WP4 "Dissemination, exploitation and communication").

Level	Main outcomes
Regulatory	Some regulations (in particular the Nitrate Directive, Sewage Sludge for Agriculture Directive, Fertilising Products Regulation, End-of-Waste criteria) are considered by end-users and producers not totally clear or to be updated, hindering the potential of circular fertilisers.
Technical	There is a lack of knowledge on the main agronomic features that circular fertilisers present (nutrient types, content and their release capacity), as well as on the local availability and distribution techniques. The end-users are in general interested on immediate results losing a long-term perspective on how they could improve the soil overall health.
Economic	To enhance the marketability of circular fertilisers is essential a close and professional relationship with the end-users to overcome the general mistrust. For this reason, the figure of the technical advisor inside the producer staff is highly recommended. Carbon credits seem an important driver to push the circular fertilisers market.
Environmental	Soil health and human safety should be the prevailing point when tackling the deployment of circular fertiliser.
Social	There is a reluctancy to "change their regular business" that sometimes burden the use of circular fertilisers by end-users. Training to technical advisors and farmers associations on the potential benefits from the agronomic and economic point of view are important to overcome this situation. Quality Assurance Schemes at national level are important instruments that Fertiliser Producer Association should consider to overcome general mistrust.

Table 20. Summary of main outcomes obtained in the co-creation activities

The different co-creation events (workshops, working groups, multitopic-seminar, focus groups) have gathered a total of **397 participants** which fulfil partially the commitments expected as it can be seen in Table 21.

The co-creation activities will continue till September 2024 to reach the impacts expected and go beyond them. An important effort will be placed by partners in the following months to improve the current indicators, with special attention on the type of stakeholder targeted.

Commitments regarding participating stakeholders	Deadline	Achieved value (Dec. 23)
150 surveys on social acceptance to end-users	Aug. 24	278
600 participants (farmers and technicians)	Sept. 24	242
120 fertiliser producers engaged in seminars	Aug. 24	2
10 external stakeholders involved in focus-groups	April 24	8
5-10 administrations invited to the working group	Aug. 24	5
30 members participating in a final workshop	Aug 24	-

Table 21. Main commitments linked to participation in co-creation activities and current values

Even though the project considers that each target group is developing the corresponding co-creation role assigned according to Table 1, an important effort will be placed by partners in the following months to improve the current indicators, with special attention to the fertilisers producers who are a category not showing high availability to participate into the project activities. Despite the fact that the project displayed an important dissemination campaign to foster engagement during the 1st multitopic seminar organised by EBA no big results were obtained. Special key messages will be addressed to them as to improve the current situation. It should also be considered that fertiliser producers have participated in other types of activities (like the workshop organised in the occasion of the General Assembly hold in Cartagena).

In addition, it should be mentioned that an online platform will be available inside FER-PLAY website to gather the feedback from the public administration. Its elaboration is currently under process.

It should also be highlighted that these co-creation activities have been useful moments where to reinforce the networking activities with other local, national or European project/platforms/initiatives. In particular, FER-PLAY events have collaborated with:

- BÖL project ProBio (in 2 occasions) – Nation project Germany
- Flemish Nutrient Platform (Nutricycle Vlaanderen) – Local platform Flanders
- NOVAFERT project – EU project

- ALFA project – EU project
- IPMworks project – EU project
- Joint with local demonstration project Boost Pocketvergisting & Nabewerking (small-scale anaerobic digestion and processing; in 2 occasions) – Local project Flanders
- Ferticycle project – EU project
- HOOP project – EU project
- CCRI Castilla y Leòn (Circular Cities and Regions Initiative) – EU initiative
- P2greeN project – EU project

Last but not least, the project considers that these co-creation activities are an essential part of the success of the project and are being carried out taking into account the ethical dimension of the objectives, the methodology and the likely impacts.

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