



Demonstration of circular bio-based fertilisers and implementation of optimized fertiliser strategies and value chains in rural communities

Deliverable 8.8:

Policy briefs - Second edition

Intermediate recommendations to policy makers about closing nutrient cycles from fruit and vegetables agro-food systems

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Summary

One of the main communication and dissemination objectives of the RUSTICA project is to define those activities necessary to engage policy makers and regulatory bodies during and after the project to pave the way for the exploitation of RUSTICA results. It is about creating a supportive policy, funding and regulatory environment for the project and its products; creating partnership agreements; enhancing territorial development opportunities also through new policies and programmes.

The Consortium is in the ongoing process of elaborating the policy briefs, having updated them to a comprehensive second version that builds upon the initial document 'Policy Briefs - First edition' (D8.4). This updated version analyses points of departure, addresses encountered problems, and includes more substantial recommendations for policy makers.

Deliverable 8.8 'Policy briefs - Second edition' aims to present the methodology, the plan, and the draft of the 4 policy briefs that will be developed during the last 12 months of the RUSTICA project. The policy briefs will be finalised in June 2024.

The RUSTICA Consortium

The RUSTICA consortium, which is composed of university researchers, academia, consultants, scientists, businesses, and farmers, is working together to achieve the project's common objective while stimulating an environment where each consortium partner shares and exchanges experiences to achieve the goals set-forth.

Table 1 - The RUSTICA Consortium

Logo	Name	Country
	University of Leuven (KU LEUVEN)	Belgium
	DRANCO NV (DRANCO)	Belgium
	Chambre Régionale d'Agriculture des Pays de la Loire (CRAPDL)	France
	BioSabor, S.A.T. (BioSabor)	Spain
	Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria (CREA)	Italy
	Fundacion para las Tecnologias Auxiliares de la Agricultura (TECNOVA)	Spain
	Avecom NV (AVECOM)	Belgium
	Entomo Consulting S.L. (ENTOMO)	Spain
	Particula Group d.o.o. (PAR)	Croatia
	Wiedemann GmbH (WIED)	Germany
	IDConsortium SL (IDC)	Spain
	Stichting CropEye (CROPEYE)	Netherlands
	Eigen Vermogen van het Instituut voor Landbouw, Visserij en Voedingsonderzoek (EV ILVO)	Belgium
	The Netherland's Organisation of Applied Scientific Research (TNO)	Netherlands
	Universiteit Gent (UGent)	Belgium
	Centro Internacional de Agricultura Tropical (CIAT)	Colombia

Acronyms and abbreviations

BBF	Bio-based fertiliser
CE	Conformité Européenne, French for "European conformity"
D	Deliverable
DG Agri	Directorate-General for Agriculture and Rural Development
EC	European Commission
ESPP	European Sustainable Phosphorus Platform
EU	European Union
FPR	Fertilising Products Regulation
LCA	Life Cycle Analysis
LCC	Life Cycle Cost
MEP	Members of the European Parliament
NERM	Nutrients in Europe Research Meeting
NGO	Non-Governmental Organisation
TRL	Technology Readiness Level

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Project Abstract

The RUSTICA project provides a technical solution to convert organic residues from the fruit and vegetable sector into novel bio-based fertiliser products of high quality that address the needs of modern (organic) agriculture. The project's ambition goes beyond the simple recovery of nutrients and includes the development of economically viable and environmentally sustainable alternatives to mineral fertilisers with the same or improved agronomic value.

The technical solution consists of 5 conversion processes (carboxylic acid platform, microbial biomass production, electrodialysis, insect breeding and biochar production) which can be combined depending on the available waste streams and integrated with state-of-the-art technologies such as composting. Synergies between the individual conversion processes will be sought and optimised to maximise economic and environmental benefits, and the processes will be demonstrated at TRL7. The resulting ingredients (microbial biomass, mineral nutrient concentrates, insect biomass, insect frass, insect chitin, biochar) will be combined to obtain tailor made fertiliser products adapted to specific crop needs.

Parallel with this technological innovation and integration, a multi-actor approach guarantees the implementation potential of the technologies in the agri-food chain and will lead to sound business models. Several non-technical aspects (environmental and social LCA, legal framework, expected market developments...) will be evaluated in 4 European regions and 1 region in Colombia. Stakeholder involvement at each step guarantees the development of marketable end products for the fruit and vegetable sector, with a high replication potential to other agricultural sectors.

Cooperation with other EU funded projects working on nutrient recovery from other waste products will stimulate a joint solution to evolve towards a sustainable and circular fertiliser management to close nutrient cycles within and between regions.

1. Introduction

RUSTICA aims to foster the **technical validation, demonstration and implementation of bio-based fertiliser and soil improvement production techniques focusing on waste from the fruit and vegetable agri-food system to close nutrient cycles on a regional level**. Additionally, project wants to **bridge the gap between the nutrient losses in the form of agricultural residues and the nutrient imports in Europe** by integrating and demonstrating 6 complementary technologies with high nutrient recovery potential to treat residues from the fruit and vegetable sector and turn them into a variety of fertiliser ingredients which will be formulated in tailor-made soil amendments and high effective fertilisers, with the aim to replace 5-10% of mineral fertiliser with bio-based alternatives by 2040.

Among the strategic objectives of the RUSTICA project are that results and insights from the 5 RUSTICA regions will be translated into business models for different archetypes of fertiliser recovery chains and comprised into a roadmap including recommendations for stakeholders and policy makers, to ensure replicability and applicability of the project's outcomes throughout Europe.

Therefore, the dissemination to policy makers and regulatory bodies has been considered as 'Dissemination for Action'. It is expected that policy makers and regulatory bodies will help pave the way for the implementation and exploitation of RUSTICA. One of the desired impacts in RUSTICA is to create a supportive policy, funding and regulatory environment for the project and its products; create partnership agreements; enhance territorial development opportunities also through new policies and programmes.

This deliverable's objective is to present the methodology and the second draft of the policy briefs developed in the last year of the RUSTICA project.

2. Methodology to be followed for the development of policy briefs:

Task 4.4 ‘European and global workshops on the replicability of the business models’ consists of the organisation of two international workshops to discuss the replicability of the developed business models within RUSTICA project.

The first workshop was organised in Leuven, Belgium in May 2022. It brought together EU level experts to discuss the overall outcomes of the RUSTICA project, including the replicability of the business models. Among the main objectives was to identify the problems represented within the framework of public policies related to circular bio-based fertilisers and regional food systems.

One of the outcomes of the 1st EU stakeholder workshop has been the identification of 4 main policy briefs with their related action plans. These will include a clear analysis of the problem, the limitations of the existing regulation and a clear definition of requirements for policy makers.

The second workshop was held in Cali, Colombia in April 2023. The workshop was organised by KU Leuven and CIAT, bringing together participants representing a broad group of stakeholders, including policymakers, industry representatives, NGOs, farmer organisations, and researchers from Latin America and Europe. The workshop aimed to foster discussion and knowledge sharing among stakeholders on circular food systems in Latin America, with a particular focus on the valorisation of waste streams from agri-food residues.

The second reunion confirmed challenges in legislation, particularly emphasising issues of delayed or insufficient legislative measures.

A clear timeline and target groups for each policy brief, both at the national and regional levels, will be defined. All policy briefs will be published in the main stakeholders' national languages to facilitate communication with national policymakers. These briefs will serve as input for the final position paper, explaining to the target groups, key stakeholders, and researchers the role of bio-based fertilisers in transitioning towards a more sustainable food system.

3. Policy briefs dissemination strategy

To ensure the policy recommendations reach the appropriate audience and stimulate action, a comprehensive dissemination strategy was developed. Each Policy Brief will have a dedicated space on the RUSTICA website, prominently featured under the Policy Lens tab, providing easy access to the documents. Promotion of these pages will be ongoing through RUSTICA's online channels, including newsletters, social media platforms, and news updates. Additionally, consortium members will actively promote the Policy Briefs at various scientific and industry events, enhancing visibility and engagement with stakeholders.

RUSTICA collaborates with the European Sustainable Phosphorus Platform (ESPP) and four RUR08 Sister projects (Fertimanure, Lex4Bio, Sea2Land, and Walnut) during NERM 2024 (Nutrients in Europe Research Meeting) to develop a joint position paper titled "Bio-based Fertilising Products: Quality, safety and alignment with EU Regulation". The paper outlines proposals on defining "Bio-Based Fertiliser" (BBF) and BBF quality, with the aim of ensuring market clarity and establishing a potential European Standard for environmental claims under the EU Fertilising Products Regulation. Moreover, the collaboration delves into understanding the acceptance of BBFs in the market, encompassing factors such as prices, subsidies, and the overall enhancement of the BBFs market.

In addition, to gather valuable feedback and insights, a survey targeted at stakeholders, inviting them to share their perspectives on each policy brief's relevance, accuracy, and completeness will be conducted. In addition, we will also organize a special event with policymakers, including representatives from DG AGRI and MEPs, to facilitate direct communication and knowledge transfer between the sector and decision-makers. This multi-pronged approach ensures that our policy recommendations are effectively communicated and acted upon by the relevant stakeholders.

4. RUSTICA's preliminary policy briefs

4.1. Policy Brief 1 - Policy and legislation on bio-based and circular fertilisers

4.1.1. Key messages

Four key challenges related to the current legislation on bio-based fertilisers are highlighted:

- Difficult transition from the current EU regulation to the new Fertilising Products Regulation
- Obstacles and uncertainties in defining new bio-based fertiliser products
- Guaranteeing a level playing field for different EU member states
- Need to strengthen the stakeholder dialogue

4.1.2. Point of departure

Europe emphasises the role of bio-based fertilisers for improving soil quality and resilience while making food systems more sustainable. Among others, this is reflected in the Farm to Fork Strategy, which calls for the urgent need to reduce nutrient losses to the environment. In that strategy, the European Commission also mentions the production of bio-based fertilisers as a 'largely untapped potential for farmers and their cooperatives'. Moreover, it is Europe's ambition to reduce the use of mineral fertilisers by at least 20% by 2030.

The European Commission has granted several projects in the framework of H2020 to work on bio-based fertilisers. Ongoing projects focus on diverse technologies and include bio-based fertilisers that are derived from animal and plant-based waste streams. This investment in research and innovation is also reflected in the new round of Horizon Europe Calls.

On the 16th of July 2022, a new regulation changed the landscape of the marketing of fertilising materials in the European Union. As a replacement for EC Regulation 2003/2003 and in addition to current national rules, EU Regulation 2019/1009 (FPR, Fertilising Products Regulation) lays down a list of materials used as feedstocks that are allowed, e.g., in fertiliser and plant bio-stimulant products.

4.1.3. Problems encountered

Although technology development and validation are showing great potential for innovations towards bio-based fertilisers, legislation lacks behind. The former EU Regulation 2003/2003 mainly referred to mineral fertilisers, while for bio-based fertilisers, companies had to rely on national authorities. The purpose of the new Fertilising Product Regulation ((EU) 2019/1009) was to include several new categories of fertilisers in the EU legislation. This was done to make the work of national authorities more efficient. Today, the EU standards for the different fertiliser categories are not yet available and only a few conformity assessment bodies have been accredited. National authorities are even incorporating the specified minimum and maximum contents outlined in Annex I of Regulation 2003/2003 into their national legislation to ensure that EC fertiliser suppliers do not face a regulatory gap. The Annex I of EC 2003/2003 relates mainly to inorganic fertiliser materials and their traditional processing procedures and contents. It doesn't solve the current bottlenecks for bio-based fertilisers produced by innovative methods and bio-based feedstocks, such as those of RUSTICA. Given that this is a notable point of concern, feedback from those who have recently requested or confirmed conformity would be valuable to understand if there have been improvements or if the issue has been addressed.

In a context of circular economy, solutions are needed for leftover materials from food production. Hence, either new terms or routes would be needed and legally defined to pave the way for these materials into the fertiliser market or the rules for waste need to be changed and aligned to the innovative technology solutions from research.

While the current progress of implementation of the new Fertilising Products Regulation might be relevant for market players aiming to register their products, it is less relevant for project consortia awaiting exploitation of their developments onto the market at a later stage. As uncertainties in legislation hinder research consortia to define market-relevant pathways for their products. One example, highly relevant for the development of bio-based fertilisers, concerns the use of animal by-products, waste and side streams. The requirements of CE-marked fertilisers are often different to national legislation in member states. Therefore, it needs to be thoroughly assessed which feedstocks, valorisation routes and value chains are possible at the European and/or national level and which are not.

Furthermore, the international aspect of the market on fertilisers requires attention. Europe must guarantee a level playing field, not just between member states, but also between the European Union and the rest of the world. Legislation should be straightforward and coherent, and controls should be put in place to avoid unfair trading practices.

Finally, there is a lack of dialogue between European policy makers and the stakeholders in the food chain. A dialogue can help policy makers to develop policies that are close to the market, and hence could be considered as a reality check. This way, the conversation may contribute to setting realistic goals and formulating a policy framework that effectively stimulates changes in the food system that lead to more sustainable outcomes.

4.1.4. Recommendations to policy makers

Legislation in Europe is intended to be aligned with its ambitions as formulated in the Farm to Fork Strategy and the Green Deal. Currently, there are many obstacles that prevent the uptake of innovation. There is a need to clearly assess which feedstocks and valorisation pathways are accepted for bio-based fertiliser production, and which are not. Provided that the right space and environment is created, stakeholders are willing to share their insight for a dialogue to take place.

The European Commission funds several projects and initiatives that relate to the development of bio-based fertilisers. Consortia struggle with the increasing complexity and uncertainty of legislation. This way, valuable time and means are wasted. Bundling forces across consortia by the European Commission could be a valuable support to overcome current barriers.

Four recommendations are identified:

- 1. Enhance alignment with Farm to Fork Strategy and Green Deal:**
Ensure that legislation aligns closely with Europe's sustainability goals outlined in the Farm to Fork Strategy and the Green Deal to promote the uptake of innovative solutions in the agricultural sector.
- 2. Clarify acceptance of feedstocks and valorisation pathways:**
Conduct a comprehensive assessment to clearly determine which feedstocks and valorisation pathways are acceptable for bio-based fertiliser production. This clarity will provide guidance to stakeholders and promote innovation in the sector.
- 3. Facilitate stakeholder dialogue:**
Foster an open dialogue between European policymakers and stakeholders in the food chain to gather valuable insights and perspectives. This dialogue can contribute to the development of realistic policies that effectively stimulate sustainable changes in the food system.
- 4. Support consortia collaboration:**
Recognise the challenges faced by consortia in navigating complex and uncertain legislation. Provide support through initiatives that facilitate collaboration and knowledge-sharing among consortia, thereby maximising efficiency and resource utilisation.

4.2. Policy Brief 2 - Reality check on the feasibility of circularity in the food system

4.2.1. Key messages

Five key challenges that need to be overcome to stimulate circular bio-based fertiliser development are highlighted:

- High production and transportation costs along with bio-based building blocks
- Reconciliation with impurities and the risk of contaminants
- Aversion towards the use of residues in the food chain
- Principles of sustainable food production
- Regional differences

4.2.2. Point of departure

Europe emphasises the role of circular bio-based fertilisers for making the food system more sustainable. Among others, this is reflected in the Farm to Fork Strategy, which calls for the urgent need to reduce nutrient losses to the environment. In that strategy, the European Commission also mentions the production of bio-based fertilisers as a 'largely untapped potential for farmers and their cooperatives'. Moreover, it is Europe's ambition to reduce the use of fertilisers by at least 20% by 2030.

Europe has granted several projects in the framework of H2020 to work on bio-based fertilisers. Ongoing projects focus on diverse technologies and include both bio-based fertilisers that are based on animal and plant-based residue streams. This investment in research and innovation is also reflected in the Horizon Europe Calls. In the same context, Europe emphasises the need for a transition towards a circular economy, including a circular food system in which resources are reused, nutrients recycled, by-products reduced and what remains is reutilised.

4.2.3. Problems encountered

Circularity has been put forward as a key challenge for a more sustainable economy, including food systems. The principles of circularity include the recycling of nutrients from residue streams through the development of bio-based fertilisers, and their application to improve soil health and crop production. Here, we highlight five key challenges that need to be overcome to stimulate their development and use.

First, while the environmental impact of bio-based fertilisers is often lower compared to mineral fertilisers, the production cost is often considerably higher than the cost of products that currently dominate the market. Therefore, further development of the market for bio-based fertilisers requires economic incentives. This certainly holds true in the initial development phase. If technologies evolve or the market for conventional mineral fertilisers comes under pressure, this may change.

To tackle this crucial aspect, leveraging the LCC analysis within RUSTICA and obtaining the final production costs for the project's products could provide valuable insights. Additionally, comprehensive information on LCAs for both fossil- and bio-based fertilisers is needed, including the production and transportation of feedstocks such as crude oil and gas. The considerable distance between primarily decentralised sources of input materials and processing units poses a challenge, as high transportation costs hinder the feasibility of profitable business cases.

Second, circular bio-based fertilisers may - just as well as fertilisers produced from fossil feedstock - contain impurities or contaminants. The question should be raised on how to reconcile the impurities and remnants of biotic or abiotic contaminants in residues with the desire to re-use those residues in agricultural practices. These impurities do not necessarily represent an environmental or human health risk. To invest in the circular

bioeconomy, and hence accept the use of residues, clear guidelines or standards should be established on what is acceptable in terms of environmental, animal, and human health.

Third, there is a cultural aversion among citizens towards the use of residues in the food chain. This is, among others, related to food crises in the recent past, such as the dioxin crises. To make the circular bioeconomy accepted by all actors in the food chain - including consumers - there is need for behavioural change. Therefore, investment in transparent communication and sensibilisation is essential.

Furthermore, many circular bio-based fertilisers are organo-mineral products. Since there are certain restrictions on the use of mineral fertilisers the question remains on how the organic food sector will handle these bio-based fertilisers. To optimise virgin materials and bio-based secondary resources, hybrid products can be produced that are neither fully organic nor fully circular but suiting well the requirements of crops and soils. These products, however, slip through the net of sustainability concepts. As a consequence, they do not gain sufficient support.

Finally, circularity implies taking into account the regional context. This includes the availability of residues, technological expertise as well as regional policies. This should be kept in mind when scaling circular concepts to a European and global level. Some concepts of circularity might be perfectly valid in one place but not necessarily valid, feasible, or sustainable somewhere else. There are many regions where the available residues are not sufficient or not sufficiently constant to guarantee the supply of bio-based fertilisers, either because of limited transport infrastructure or because of conflicting demands for these residue streams (e.g., animal feed or fuel).

4.2.4. Recommendations to policy makers

Europe should align investment, regulation, and support with its ambitions, as formulated in the Farm to Fork Strategy and the Green Deal. Economic reality and obstacles in legislation inhibit research and innovation towards more circular food systems. The opportunities for improvement do not only lie in incentivising bio-based fertilisers, but also in the harmonisation of guidelines, communication and sensibilisation about circular food systems, a decoupling of sustainability concepts to gain support for hybrid products and the recognition and valorisation of regional contexts. Stakeholders are willing to provide their insight. If the right space and environment is created, a dialogue can take place.

Finally, the European Policy should recognise regional diversity in residue generation and soil requirements across Europe. For example, transporting final products also means transporting nutrients. Additionally, while it is important to encourage circularity, it is critical not to encourage waste production in case residue volumes are low. Regional diversity heavily impacts the agricultural production and hence makes circularity in some regions more sustainable than in other regions.

Six recommendations are identified:

- 1. Align with policy ambitions:**
Ensure that investment, regulation, and support align with the goals outlined in the Farm to Fork Strategy and the Green Deal. Overcome legislative barriers hindering progress toward circular food systems.
- 2. Harmonise and communicate:**
Harmonise guidelines and enhance communication and awareness about circular food systems. Clarify terminology and standards to facilitate market acceptance and consumer confidence.

3. **Support hybrid products:**
Provide support for hybrid products that bridge the gap between organic and circular principles. Optimise the use of virgin materials and bio-based resources to address challenges in organic food sector acceptance.
4. **Recognise regional contexts:**
Recognise and valorise regional diversity in residue generation and soil requirements across Europe. Tailor circularity efforts to suit the specific needs and capacities of different regions.
5. **Encourage stakeholder dialogue:**
Encourage stakeholder engagement and dialogue. Create an environment conducive to dialogue to gain valuable insights from diverse perspectives, helping develop realistic and effective policies.
6. **Consider waste production:**
Be cautious not to inadvertently encourage waste production, especially in regions with low residue volumes. Tailor circularity efforts to avoid unintended consequences and promote sustainable practices.

4.3. Policy Brief 3 - Recognising various aspects of sustainability of the food system

4.3.1. Key messages

Three key challenges to the adoption of sustainable farming practices are identified:

- Coexistence of sustainable farming approaches as sources of innovation
- A missing profitable business case for integrated farming systems
- The economic reality and regional diversity

4.3.2. Point of departure

With the Farm to Fork strategy, Europe formulates the ambition for a transition towards a more sustainable food system. Europe presents an integral and unique policy that covers the entire food chain: production, processing, and consumption. The strategy breaths ambition and calls for, among others, the need to reduce mineral fertilisation. The European Commission also mentions the production of bio-based fertilisers as ‘a largely untapped potential for farmers and their cooperative’.

The Farm to Fork Strategy suggests that, in order to reach more sustainable food systems, alternative approaches should be stimulated. These approaches can include organic agriculture, regenerative agriculture, and agroecology. While organic production methods typically exclude mineral inputs, there are exceptions; for instance, phosphorus and potassium are permitted in mineral form under certain conditions. However, regenerative agriculture empowers farmers by embracing principles that enhance overall soil health and biodiversity. Agroecology has a lot in common with regenerative agriculture, including the focus on soil and ecosystem restoration, but also emphasises the role of the social dimension in the ecological system.

4.3.3. Problems encountered

Many approaches to sustainable farming have been put forward as leading principles for sustainable food production, including organic farming, regenerative farming, agroforestry, and agroecology. All of them represent a source of innovation and information. However, innovation can also stem from eco-efficiency in what is perceived as conventional or industrial agriculture. Different approaches to sustainable agriculture will most likely mature and should coexist.

Each approach is subject to specific constraints. For example, the feasibility of large-scale expansion of organic production is often questioned due to physical, logistical, or economic limitations. However, agricultural production methods that do not tick all the sustainability boxes should not be left behind. Farming systems can fall anywhere in between these approaches. Integrated systems can maintain the benefits introduced by these systems, but their economic viability and business case represent a challenge. It is also worth mentioning that in the case of a transition from conventional to organic farming, a challenge arises from the increased demand for field size (estimated at 30-50%), while the expected yield should remain constant. This implies that, to ensure food production for humanity, more land for farming needs to be converted from natural habitats, which appears counterproductive in terms of sustainability.

While organic markets continue to grow and price premiums can make organic systems profitable, this represents only a very small part of the food system. The economic reality is that farmers are price takers subject to the world food market. Additionally, inequalities persist, and not all farmers have the ability to invest in sustainable practices. Food production highly depends on regional characteristics. To find a good balance between resilient and sustainable intensification of farming systems on the one hand and the protection of natural habitats on the other hand, there is a huge potential in recognising the regional diversity across Europe.

4.3.4. Recommendations to policy makers

International recognition of various sustainability approaches should encourage coexistence of practices, including the contributions made in the conventional agricultural sector. Furthermore, the economic reality of the agricultural sector and the global food system should be recognised. A great opportunity lies in stakeholder dialogue. Under the right circumstances, stakeholders are willing to provide their insights. This can help policy makers to develop policies that are close to the market and can contribute to realistic goal setting.

Five recommendations are identified:

- 1. Encourage coexistence:**
Foster international recognition of various sustainability approaches to promote the coexistence of practices, including those from the conventional agricultural sector. Emphasise the importance of acknowledging and valuing diverse farming methods.
- 2. Recognise economic realities:**
Acknowledge the economic realities of the agricultural sector and the global food system. Understand the challenges faced by farmers, particularly regarding price volatility and market pressures, and tailor policies to address these issues.
- 3. Facilitate stakeholder dialogue:**
Facilitate stakeholder dialogue to gather insights and perspectives from various actors in the food system. Engage with farmers, industry representatives, environmental advocates, and policymakers to develop policies that are pragmatic, market-oriented, and conducive to sustainable outcomes.
- 4. Align policies with market realities:**
Develop policies that are closely aligned with market dynamics and realities. Ensure that policies are informed by stakeholder feedback and grounded in practical considerations, contributing to the achievement of realistic and measurable goals.
- 5. Promote regional diversity:**
Recognise and embrace the regional diversity across Europe. Tailor policies to accommodate the unique characteristics and challenges of different regions, promoting resilience and sustainability in agricultural practices.

4.4. Policy Brief 4 - Circular bio-based fertilisers in an international context

4.4.1. Key messages

Two challenges related to the international context of circular bio-based fertiliser production and trade are summarised:

- Contradictory implementation of EU Regulation
- Competitive advantages related to regional hotspots

4.4.2. Point of departure

The Farm to Fork Strategy articulates the EU's ambition of making its food system sustainable at all stages of the value chain. This strategy includes a target of at least 20% reduction in fertiliser use by 2030 and emphasises the bioeconomy as a major area of action. The strategy relies on research and innovation to enable this transition. The European Commission has granted several projects in the framework of H2020 to work on bio-based fertilisers. Ongoing projects focus on diverse technologies and include both bio-based fertilisers that are derived from animal and plant-based waste streams. This investment in research and innovation is also reflected in the new round of Horizon Europe Calls.

The Global South is impacted by European policies in multiple ways. This does not only include Europe's commitment to cooperate with other countries in tackling global challenges in international contexts, but it also relates to the use of development funding to support research and innovation as well as trade laws and deals. An example of regulation impacting fertiliser trade is the new EU Fertilising Products Regulation. On the 16th of July 2022, this new regulation changed the landscape of the marketing of fertilising materials in the European Union. As a replacement for EC Regulation 2003/2003 and in addition to current national rules, EU Regulation 2019/1009 (FPR, Fertilising Products Regulation) lays down a list of materials, properties and processes allowed for in fertiliser and plant bio-stimulant products.

4.4.3. Problems encountered

National authorities in the EU member states need to implement the Fertilizer Products Regulation. Misinterpretation of this regulation as well as a different focus on certain regional peculiarities could lead to inconsistencies in the implementation of the guidelines and rules. Regulation should allow for fair competition between member states as well as non-EU countries. Similarly, it is hard to guarantee a level playing field between products produced in the EU and imported products. Discrepancies in regulations around the globe can make international trade and cooperation more difficult.

When it comes to circular bio-based fertilizers, the creation of a level playing field is complicated by the regional differences in soil requirements and residue availability. Exporting final products means exporting nutrients. There are nutrient excessive hotspots across regions, as well as within regions. However, regional nutrient requirements are different as well. It is not only a waste issue; it's also a soil issue. As such, some regions have a competitive advantage when it comes to the production and use of circular bio-based fertilisers. Different regions can also complement each other in their needs, availabilities, and expertise, making international cooperation beneficial. In addition, regional advantages related to energy availability have become increasingly important, particularly in the current scenario where this poses a significant challenge in most countries. Some nations are less affected, naturally, depending on their possession of independent and reliable energy sources.

In the Global South, food prices are what matters most. Circular bio-based fertilisers may work if they tackle the waste issue at a profitable price. The first major requirement is the separate collection of waste, but these lags behind. Small-scale solutions are often very expensive as well. Nevertheless, since transport of biomass often seems to be a big hurdle, it will be important to develop local solutions.

4.4.4. Recommendations to policy makers

In first instance, especially in the Global South, solutions must be developed locally. These solutions must take the size and the location of the system into account. To achieve this, there must be a focus on developing cost-efficient solutions for different needs. However, the local food system's needs might not match its residue availability and expertise. Therefore, regulation should ensure a level playing field to encourage international cooperation and trade of bio-based building blocks and fertiliser blends. Europe should acknowledge the tension between promoting international trade and cooperation on the one hand and promoting and protecting local food systems on the other hand.

Four recommendations are identified:

- 1. Develop local solutions:**
Prioritise the development of locally tailored solutions, especially in regions like the Global South where food prices are critical. Consider the size and location of the system to ensure cost-efficiency and effectiveness.
- 2. Focus on cost-efficient solutions:**
Direct efforts towards developing cost-efficient solutions that address diverse needs. Recognise that small-scale solutions may be expensive and prioritise initiatives that are economically viable and scalable.
- 3. Ensure regulatory fairness:**
Implement regulations that promote a level playing field to encourage international cooperation and trade of bio-based building blocks and fertiliser blends. Ensure that regulations support both local and international stakeholders while maintaining fairness and transparency.
- 4. Acknowledge trade and local needs:**
Recognise the tension between promoting international trade and cooperation while also supporting and protecting local food systems. Balance efforts to facilitate international collaboration with measures to safeguard local food security and sustainability.

4.5. Policy Brief strategy for next project phase

The project's final year plan consists of two distinct phases. From January to June 2024, the focus will be on advancing the drafting of policy briefs, with the goal of finalising their main content by June 2024. Partner Wiedemann is expected to contribute valuable insights and expertise during this period. In June, RUSTICA plans to host a brief workshop in Brussels, featuring a select group of EU Commission DG AGRI experts, with potential invitations extended to MEPs. The primary objective of the workshop is to elaborate on RUSTICA's work on regional business models and provide an opportunity for in-depth discussions on the policy briefs.

In the second half of the year, from July to December 2024, the emphasis shifts to the preparation of communication and dissemination materials. Translation of the final policy briefs into various languages spoken across the RUSTICA regions will ensure that the key findings and recommendations reach a diverse audience.

5. Proposal on the definition of “Bio-Based Fertiliser”

European Sustainable Phosphorus Platform ([ESPP](#)), in collaboration with the RUSTICA project, among others, has developed a proposal for the definition of "Bio-Based Fertiliser." This initiative aims to enhance market clarity in product communication to users and consumers, emphasising the significance of terms like "Bio-Based Fertiliser" and "nutrient of solely biological origin." The overarching goal includes the establishment of a potential European Standard for defining and measuring the "Bio-Based nutrient" content to support environmental claims and certification under the EU Fertilising Products Regulation.

The full proposal is available on the ESPP website through the following [LINK](#).