



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

POLICY BRIEF 3

Bio-based fertilisers as a piece of the puzzle in the transition towards more sustainable food systems

Key messages

We summarise three key challenges to the adoption of sustainable farming practices as a whole, and bio-based fertilisers in particular.

- Sustainable farming requires the integration of various farming practices.
- There is a need for profitable business models related to sustainable farming systems.
- Research on the development of bio-based fertilisers should be organised in an interdisciplinary and transdisciplinary manner.

Point of departure

With the Farm to Fork strategy, Europe has articulated its ambition for a transition towards more sustainable food systems. Europe presents an integrated and comprehensive policy that covers the entire food chain: production, processing, and consumption. The strategy embodies ambition and calls for, among other things, a reduction in the use of synthetic (mineral) fertilisers and the valorisation of residual streams. The European Commission also identifies the production of bio-based fertilisers as 'a largely untapped potential for farmers and their cooperative'.

Problems encountered

Various concepts and defining principles for sustainable farming have been proposed, including organic farming, regenerative farming, and agroecology. Different approaches to sustainable agriculture are likely to mature and coexist. There is no single solution that will address all the challenges related to sustainable food systems. In reality, each farming system faces specific constraints. In this context, the polarisation between conventional farming and alternative farming practices does not contribute positively to the debate.

The use of bio-based fertilisers, among other benefits, stimulates soil biodiversity, thereby fostering natural mineralization and enhancing soil and crop resilience. In the transition towards more sustainable farming, a combination of both mineral fertilisers and circular bio-based fertilisers may offer the optimal solution at the regional or farm level.

Furthermore, robust and resilient business models are essential to motivate farmers to make investments that increase sustainability at the farm level. Sufficient effort should be directed

toward developing business models that support sustainable farming practices. In this context, it is important to recognise the regional differences across Europe. These differences apply not only to the physical environment in which farmers operate but also to the social and economic environments, such as perception of the circular economy. These differences must be taken into account when considering the potential for upscaling successful sustainable practices.

Finally, the RUSTICA project has highlighted the urgency of working both interdisciplinary and transdisciplinary to maximise the impact. Collaboration between researchers from different disciplines - is essential to address the full spectrum of sustainability and to achieve results that add value in agronomic, ecologic, economic and social terms. Additionally, the importance of transdisciplinarity should not be underestimated. To develop a marketable product, close cooperation with diverse key actors should be encouraged from the very beginning of a project.

Request to policy makers

International recognition of various sustainability approaches should encourage the coexistence of different farming practices. Bio-based fertilisers have the potential to contribute to sustainability across all farming systems. Furthermore, the economic realities of the international food system must be acknowledged. A significant opportunity lies in fostering stakeholder dialogue, which can help policy makers develop market-aligned policies and contribute setting realistic goals.