



Healthier soils and less CO₂ through multifunctional bio-based fertilisers

Research and innovation goals

SUSFERT will develop sustainable multifunctional fertilisers. The innovations combine bio-based and biodegradable coatings, probiotics and struvite — a source of renewable phosphorus. Field trials will be conducted to test four different phosphorus (P) and iron (Fe) products with novel organic formulations, microgranules, granules and liquid fertilisers. The evaluations will include aspects related to economic potential and environmental sustainability, ensuring industrial-scale production processes.

What SUSFERT is for

Bio-based fertilisers have high potential to decrease soil contamination and greenhouse gas emissions, while for conventional fertilisers mining and transport are CO₂ intense, and raw materials are becoming scarce. SUSFERT will develop sustainable new sources to supply P and Fe to plants that fit existing production processes and EU agricultural practice. They will establish local value chains, contributing to rural communities. These highly sustainable bio-based fertilisers will replace conventional products (heavily depended on imported rock phosphate and will valorise various side streams and by-products of several industries to strengthen the European circular economy. The current dependency of the EU on mineral P may be reduced by 40% through these novel green technologies.

The stable P source provided by struvite will provide a huge benefit compared to today's P-production processes. A reduction of greenhouse gases (up to 2–4%) is aimed for, in turn leading to additional savings by fewer CO₂ costs.

Technological approach

SUSFERTs innovative concepts include: 1) probiotics based on P- and Fe-solubilising Bacilli and Actinobacteria; 2) a demonstration of a microbial siderophore (Fe chelator); 3) the enzymatic modification of the by-product lignin for cost-effective, bio-degradable controlled release coatings and product stabilisation; and 4) a demonstration of struvite, a renewable source of P found in wastewater as a partial substitute for mineral P.

The project takes account of the whole value chain, covering all steps along production lines of the new fertiliser products, ranging from the optimisation of key components to the processing of these components and to the establishment of large production processes. The project aims to attain cost effective enzymatically-modified lignin-based coatings for product stabilisation and controlled release.

TRL: 4–6 (current level); **TRL 7–8** (project goal level)

Main markets and main clients

The increase in organic agriculture coupled with rising demand for fertiliser certified for organic farming will be supported by SUSFERT in terms of efficacy and efficiency. The project will align its innovations to the latest EU fertiliser regulation framework conditions, presented in June 2019. By offering viable SUSFERT products consumers will be offered a new sustainable and bio-based alternative to current commodity products (conventional fertilisers).

Main clients include: fertiliser producers, retail agri shops, cooperatives, both organic and conventional farmers.

Commercialisation steps

SUSFERT will prepare the products for the market, and the partners in the project will follow different routes according to their position in the value-chains. Following the successful field trials of the different components and compound fertilisers, the project expects to reach the registration dossiers.

There are strategies to apply for a number of patents, and all industry partners are determined to commercialise the results. The main product(s) will be marketed by fertiliser companies. As the project covers the whole value chain, several components also present commercial value. An industry partner and an academic partner have the technology needed for coating and controlled coating release, and another industry partner will produce the fertiliser in granulate and liquid form.

The patentability and the feasibility have been studied; a customer needs analysis has been performed. Also, a project business model exists (EUR 50–60 million increase in turnover), as well as detailed project supply chain descriptions. Regulatory and entrepreneurial aspects of the commercialisation process have been taken into consideration.

What SUSFERT is looking for

- Networking and matchmaking
- Knowledge sharing opportunities with SMEs/investors/start-ups
- Assessment of market potential through KETBIO's Commercial Committee

Partners

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