

BUSSINES MODEL – Pays de la Loire

Business model based on a collaborative network in France

SHORT SUMMARY FOR PRACTITIONERS

EN version

The RUSTICA project aims to develop bio-based fertiliser (BBF) technologies and business models (BM) using waste from the fruit and vegetable sectors to close regional nutrient cycles. In France, 3 theoretical BM have been designed with the focus on a collaborative network of companies. A fertiliser company plays a central role in the BM of solid fertiliser, to which a local insect producer could supply insect frass, while two anaerobic digestion facilities, which are located close to the fertiliser company, could produce and deliver microbial proteins. Remaining building blocks, such as biochar and compost, could be managed by waste management organisations operating in the region, which specialise in composting and plan to install biochar units in France. All this provided that the BM proves to be technically, economically and environmentally viable, which is not the case at the moment. The main challenges are the high costs of BBF production and low agronomic performance compared to the conventional mineral fertilisers. The BM for liquid fertiliser is also based on a fertiliser company, which could use the NPK concentrate, obtained via electrodialysis (a relatively young technology, which requires further testing, optimisation and validation) as a nutrient base supplemented by other NPK sources. Despite these barriers, continuously increasing prices of mineral fertilisers and stricter environmental regulations present opportunities for BBFs. Although not researched in the RUSTICA project, the long-term sustainability effect and improved soil health offer further potential benefits of BBFs, but financial incentives and regulatory adjustments are needed for their wider acceptance and adoption amongst farmers.

SHORT SUMMARY FOR PRACTITIONERS

NATIVE version

Le projet RUSTICA vise à développer des technologies et des modèles économiques de fertilisants biosourcés (BBF) utilisant les déchets des secteurs des fruits et légumes pour fermer les cycles régionaux des nutriments. En France, 3 modèles économiques ont été conçus et ajustés et se concentrent sur un réseau d'entreprises. Une société distribuant des fertilisants joue un rôle central dans le modèle économique des fertilisants solides, à laquelle un producteur local d'insectes pourrait fournir de la déjection d'insectes, tandis que deux installations de digestion anaérobie, situées à proximité de la société pourraient produire et fournir des protéines microbiennes. Les éléments restants, tels que le biochar et le compost, pourraient être gérés par des organismes de gestion des déchets opérant dans la région, qui sont spécialisés dans le compostage et prévoient d'installer des unités de biochar en France. Tout cela à condition que le modèle d'entreprise s'avère viable sur les plans technique, économique et environnemental, ce qui n'est pas le cas actuellement. Les principaux défis sont les coûts élevés de la production de fertilisant biosourcé et les faibles performances agronomiques par rapport aux engrais minéraux conventionnels. Le modèle économique de l'engrais liquide repose également sur une entreprise du fertilisant qui distribuerait le concentré NPK, obtenu par électrodialyse (une technologie relativement jeune qui nécessite des essais, une optimisation et une validation supplémentaires) comme base nutritive complétée par d'autres sources de NPK. Malgré ces obstacles, l'augmentation constante des prix des fertilisants minéraux et les réglementations environnementales plus strictes offrent des opportunités pour les BBF. Bien qu'ils n'aient pas fait l'objet de recherches dans le cadre du projet RUSTICA, l'effet de durabilité à long terme et l'amélioration de la santé des sols offrent d'autres avantages potentiels des BBF, mais des incitations financières et des ajustements réglementaires sont nécessaires pour qu'ils soient plus largement acceptés et adoptés par les agriculteurs.

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

RUSTICA



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BUSINESS MODEL – Pays de la Loire

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CONTEXT

In addition to providing a technical solution to convert organic residue streams from the fruit and vegetable sector into novel bio-based fertilisers (BBFs), the RUSTICA project also aims to develop economically viable and environmentally sustainable regional business models. In Pays de la Loire (France), agriculture is a cornerstone of the local economy, and the region has been proactive in fostering the bioeconomy, with a number of initiatives and collaborations between public and private stakeholders.

PROBLEM

The Pays de la Loire region faces a number of challenges: the decline in livestock farming, which provides producers with organic matter for the soil, the region's dependence on foreign synthetic fertilisers, and the need for more sustainable agriculture. On the other hand, even if there is potential competition for valorisation of certain residues, others could be better valorised.

APPROACH

Different drafts of business model were refined and adjusted with data collected from regional stakeholders during the multi-stakeholder workshops, as well as one-on-one interviews with relevant market players. Based on their input, three business models were tailored with the focus on a collaborative network involving waste management organisations, fertiliser companies, insect producer and anaerobic digestion facilities. By fostering cooperation among these companies and introducing new technologies, such as pyrolysis for biochar production, CAP Platform, and microbial biomass cultivation, the model aims to enhance the recovery of valuable nutrients from organic waste streams.

OUTCOME

1. The refined business model enables fertiliser companies to diversify their source of building blocks to increase the production of BBF blends.
2. These blends have been tested for their agronomic performance, economic viability and environmental impact.
3. While the blends deliver moderate nitrogen levels to crops, they are not cost-competitive compared to mineral fertilisers under the present market conditions (the upscaling of selected technologies could bring the cost of BBFs down)
4. The environmental performance is promising, especially if the long-term effect of BBFs on soil health are also taken into consideration.

PRACTICAL RECOMMENDATIONS

- ✓ The regional network must explore alternative solutions, building blocks or technologies that better meet economical and environmental expectations (e.g less and other source of protein, less biochar)
- ✓ The costs could decrease with larger-scale production, particularly for microbial proteins and frass.
- ✓ Farmers should be supported with training and incentives to adopt BBFs, particularly in light of stricter nitrogen regulations.
- ✓ Policymakers should consider subsidies and financial incentives to encourage investment in BBF technologies and infrastructure.