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

2021/22

RUSTICA Newsletter

RUSTICA, a European research innovation project involving university researchers, academia, consultants, scientists, businesses and farmers.

THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER GRANT AGREEMENT NO 101000527

Summary

What is in this newsletter?

This first edition of the RUSTICA newsletter provides an update on the different work packages part of the project, the main activities undertaken so far and the intermediate results obtained during the first year of the project.

RUSTICA project work packages: activities and intermediate results

The RUSTICA project is structured in 9 interrelated work packages. In the following sections you can see the main activities carried out during the first year (2021) as well as the intermediate results obtained.

Upcoming events

4th Project meeting: Ghent, Belgium, from 28 till 30 April, 2022.

1st European and global stakeholder workshop: Leuven, Belgium, on 18 May 2022.

Get involved

Interested in contributing to the RUSTICA project?

Participate in one of the workshops at regional level. Five regional networks are established: Flanders, Almeria, Friuli-Venezia Giulia, Pays de la Loire and Valle del Cauca.

There are three possible ways of involvement in the RUSTICA knowledge network:

- Actors join the workshops and are involved directly in the development of the project in a way that suits their expertise.
- Stakeholders join the workshops or other project activities related to their expertise.
- Just stay informed, to get information on the progress of the project. Opportunity to give feedback.

For more details on how getting involved in the RUSTICA project, visit the RUSTICA website and fill in your registration!

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Editorial

Key global trends and challenges, including climate change and population growth, influence food and agriculture today, and will continue to impact our food system in the coming decades. In this context, the valorisation of food waste streams can be considered as an important opportunity for the agricultural sector.

The RUSTICA project focuses on waste from fruit and vegetable production. More specifically, the RUSTICA consortium investigates the potential to develop bio-based fertilisers using fruit and vegetable waste as feedstock. The project builds on two pillars. On the one hand, the consortium investigates the technological process from waste to bio-based fertilisers. On the other, the market development opportunities are explored including organisational and logistical aspects, environmental and social assessments, legal frameworks and other socio-economic concerns.

The RUSTICA consortium bundles expertise from academic and non-academic partners all across Europe. The consortium is led by the University of Leuven. Moreover, the International Center for Tropical Agriculture (CIAT) is a full partner in the consortium, guaranteeing impact and outreach at the global level.

As the project moves forward, the consortium will be sharing its findings through regular updates and creative content. A few videos in 5 different languages have been published already. You can watch them on the RUSTICA website anytime.

If you are interested in participating in this project as one of our stakeholders, get in touch with us through our website. Together we can pave the way towards a more sustainable agriculture

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About RUSTICA

The RUSTICA project aims to provide a technical solution to convert organic residues from the fruit and vegetable sector into novel, high-quality, bio-based fertiliser (BBF) products, a solution that addresses the needs of modern (organic) agriculture. The project's ambition goes beyond the simple recovery of nutrients. It also includes the developments 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. 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 tailormade 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 it will lead to sound business models. Several non-technical aspects (environmental and social LCA, legal framework, expected market developments, etc.) will be evaluated in four European regions and in one 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 sustainable and circular fertiliser management to close nutrient cycles within and between regions.

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[N]entoTainer

Project management (WP1)

Work package 1, Project Management, is led by KU Leuven. Its overall goal is to ensure dynamic and efficient governance of the project. Taking care of the day-to-day management of the RUSTICA project, Tessa Avermaete and Margo Heremans, project managers at the Division of Bioeconomics within the Department of Earth and Environmental Sciences at KU Leuven, introduced some solid fundaments to ensure optimal management of project resources and compliance with the work plan.

During the first 12 months of the project they focused on three main domains: cooperation, communication and administration.

- Cooperation

The project kicked off in full COVID crisis with a 2-day online project meeting early February 2021. Since then, over 30 online meetings have been organised, equivalent to nearly 70 hours of online meetings or 8 full working days. Different types of meetings (Consortium meetings, General Assembly meetings, Steering Committee meetings, Work Package Lead meetings, Market Development meetings and Technological Development meetings) were held, all with one overarching objective: to ensure good collaboration among the 16 consortium partners.

Information and knowledge sharing, as well as a strong interaction between partners, work packages and tasks, are key to a successful collaboration, especially if consortium partners have no track record in working together. The project templates were developed and the procedures were set up in order to facilitate information and knowledge sharing.

After 11 months of online meetings, a first live consortium meeting was organised, hosted by Tecnova in Almeria, Spain. With COVID cases increasing all over Europe in the run up to the meeting, project management decided, after ethical considerations with many pros and cons, to stick to the live format, combining live sessions, hybrid sessions and field visits. The benefits of these first human interactions (14 out of 16 partners were represented in Almeria) will definitely impact the future collaboration.

- Communication

To promote communication and information exchange, every 3 weeks an internal news update is sent to all consortium partners. This internal news update summarises the progress of the project: status of deliverables and milestones, upcoming meetings, link to minutes of past meetings, team updates, interesting events, actions to take, etc

To promote the RUSTICA project, a short video explaining what the project is about was recorded by the KU Leuven team.

- Administration and quality management

To coordinate, monitor and structure project development, a Project Management Procedures and Quality Plan was developed at the start of the project. The plan describes how the project will be managed and defines the partner activities, the general risk management and the procedures to ensure high-level scientific quality of the results and other project outputs.

Our team

KU LEUVEN

Tessa Avermaete

Tessa Avermaete obtained a master at the Faculty of Bio-Engineering (KU Leuven). She holds a PhD at the University of Ghent (2004), where she investigated innovation in European food SMEs. She is member of the EIP focus group on new entrants in farming and the metaforum workgroup on food security and food production. Tessa shares the responsibility of project management with Margo Heremans. She ensures all RUSTICA colleagues can work in a perfect environment, deliver in time and enjoy their involvement in the project. Project management is the link between the RUSTICA consortium and the European Commission, responsible for a smooth and transparant communication between both parties.

Margo Heremans

Margo Heremans joined the division of Bioeconomics at KU Leuven in January 2021. Together with Tessa Avermaete, she is managing two Horizon 2020 projects: RUSTICA and COCOREADO.

She has extensive experience in communication and event/project management with senior roles at Seauton, a Leuven-based organizer of congresses and meetings worldwide, Vlerick Business School and Apple. She lived and worked in London, Singapore and Amsterdam. She likes travelling, loves cooking for family and friends and enjoys reading. She holds a Master in Applied Economic Sciences from KU Leuven.

Liesbet Vranken

Liesbet Vranken has a Master in Bioscience Engineering and a Phd in Economics, both from the University of Leuven. She is currently working as a professor in agricultural, resource and food economics at the division of Bioeconomics of KU Leuven. Within the division, Liesbet is head of the research group Society-Environment Interactions. Liesbet is the project coordinator of the RUSTICA project.

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KU LEUVEN

Erik Mathijs

Erik Mathijs is Professor of Agricultural and Food Economics. His research focuses on the monitoring and implementation of sustainability transitions in the agro-food sector, including the role of explorative and normative scenarios

Erika De Keyser

Erika is a PhD student at the KU Leuven division of Bioeconomics. She obtained her degree in Spatial, Transport and Environmental Economics at the VU Amsterdam in 2020. Erika contributes to RUSTICA by exploring and co-creating robust business models for the technological innovations.

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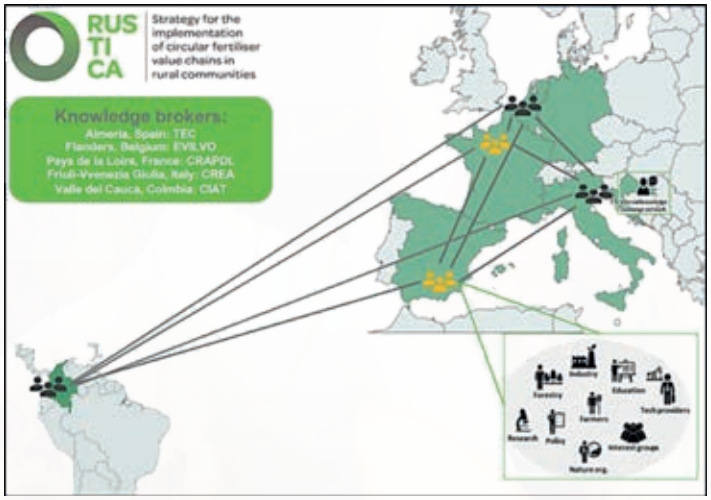
Multi-actor network (WP2)



In the frame of work package 2 led by ILVO, a first round of regional stakeholder workshops was successfully organised, in the five RUSTICA regions: Flanders, Friuli-Venezia Giulia, Almeria, Pays de la Loire and Valle del Cauca in October and November 2021. The regional knowledge brokers were trained by ILVO to organise the workshops. The knowledge brokers' main role, hence, was to moderate the workshops while transferring the knowledge obtained from the project to the local stakeholders. The aim for the organisation of these workshops was twofold: (1) to introduce the RUSTICA project to the regional stakeholders and (2) to validate, in a participatory way, the ongoing research processes to match the RUSTICA results with local needs. In this regard, stakeholders of different types such as farmers' associations, technology providers, waste-processors, fertiliser companies, policymakers and research organisations were invited and participated in the workshops.

During the regional workshops, stakeholders were asked about the ideal outcome of the RUSTICA project in the short or long term, they reviewed a summarised market analysis of their region with respect to waste streams, bio-based fertilisers potential, existing actors, competition and the agricultural sector's innovation orientation.

They also provided input on the characteristics of a possible new bio-based fertiliser blend and on the bio-based fertilisers stakeholder network drafted by RUSTICA partners. Taking it a step further, the participants discussed the factors that influence the future of bio-based fertilisers (future scenarios) in their region. Through the results of these workshops, the RUSTICA partners gain insights into the local needs in and the potential of each RUSTICA region. Moreover, the second round of regional workshops is planned to be organised around May and June of 2022.

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Our team

Alba Alonso

Alba is an Environmental Scientist from Spain with a specialization in biodiversity in agricultural landscapes and sustainable agriculture. She studied a Bachelor degree in Environmental Sciences and a Master degree in Biodiversity and Conservation Biology at Pablo de Olavide University. Alba´s broad background in environmental sciences allows her to have a global vision as well as a strong passion for sustainability.

Recently, she started working at ILVO as a PhD candidate focusing on projects such as RUSTICA, FOODLEVERS, and SOY2GROW. Her involvement in RUSTICA will concern the sustainability in a circular economy for agriculture through a participatory approach using Agent Based Models. As an environmental scientist, Alba will focus specifically on the environmental sphere of sustainability for the agricultural sector.

Fien Amery

Fien Amery (ILVO) is PhD in Bioscience engineering, with expertise in soil chemistry. After a postdoc position at KU Leuven on phosphorus availability in tropical soils, she moved to ILVO in 2012 as a senior researcher. She was involved in several projects on phosphorus in agriculture and environment related to policy. She is deputy responsible of the ILVO lab Plant, Crop and Husbandry and involved in analyses on soil, feedstocks, growing media, compost, water and plants. In RUSTICA, Fien will be involved in work package 7 "Fertiliser blending and validation". ILVO is task leader for task 7.3 regarding laboratory, pot and field validation of product fertilisers that were formulated to match local demands. Fien will coordinate the trials conducted by the several project partners and supervise the field trials with leek and cauliflower to assess the effect of the application of the newly developed fertiliser blends on crop performance and N availability and microbial activity in the soil.

Hanne Cooreman

Hanne Cooreman does research in Educational Theory, Learning Effectiveness and Efficiency, Didactics, Peer Learning and Adult Education at the Research Institute for Agriculture and fisheries (ILVO) in Flanders, Belgium. She obtained a master degree in educational sciences (UGent, 2016) and a teacher degree (2020). In March 2021, she finished her PhD thesis 'Enhancing peer learning for sustainable agriculture', related to the Horizon 2020 European project AgriDemo-F2F (2017-2020). She also wants to draw more attention to the other way around: how can we enable practice stakeholders better to inform the research agenda? Central to these methods are different kinds of (facilitated) dialogue, sharing multiple perspectives and a systemic thinking approach. In line with her interests and together with other partners and ILVO colleagues involved in work package 2, she works on the development and realisation of the multi-actor approach in RUSTICA.

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ILVO
Flanders Research Institute for Agriculture, Fisheries and Food

Siavash Farahbakhsh

Siavash is a post-doctoral researcher at the Social Sciences Unit of the Flanders Research Institute for Agriculture, Fisheries and Food (ILVO), Belgium.

In RUSTICA, his main scientific role is to contribute to task 3.5. In this task, an ABM is developed based on the collected socioeconomic data aiming to investigate the adoption of new waste valorisation technologies and new value chain creation for the RUSTICA product. Complementing this task, he also contributes to work package 2 aiming to create a multi-actor knowledge network to ensure a successful collaboration within and between each region by bringing in a wide network of relevant actors.

Jef Van Meensel

Jef Van Meensel obtained a PhD in bioscience engineering at Ghent University in 2011. As a senior researcher at the Social Sciences of ILVO, he is responsible for the research cluster "business economics". He coordinates projects and guides researchers that focus on profitability analysis, the identification of improvement strategies and business models for firms, and the development of decision support tools.

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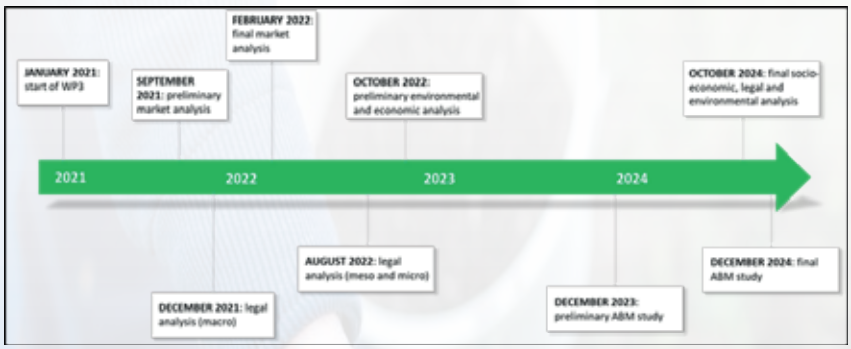
Systemic feasibility assessment (WP3)



The work in work package 3, led by the Particula Group, over the first 12 months of the RUSTICA project, focused mostly on producing descriptions of the regions and the market analyses and on the Legal analysis and (organic) farming regulatory framework. For 5 regions: Flanders, Friuli-Venezia Giulia, Almeria, Pays de la Loire and Valle del Cauca, a market and business prefeasibility study concerning the RBBFs (RUSTICA Bio-Based Fertilisers) was carried out. To carry out a regional evaluation, a questionnaire was completed by the regional RUSTICA partners and various sources were consulted, such as agricultural, economic, social, and demographic-geographic statistics; vision documents and annual reports. The information obtained was processed via a SWOT analysis, a TOWS matrix, and a DESTEP-environmental analysis. The conclusions and subsequent implications were formulated in the business profiles and the corresponding fact sheet infographics.

To identify legal challenges at the EU level for the RBBFs, an in-depth analysis of EU secondary law with a legally binding character on the value chains proposed by the RUSTICA project was carried out. The study focused on the variety of feedstocks, the spectrum of processing methods, requirements of products addressing CE marked fertilisers and those for organic production. In addition, legal sources were scrutinised on their relevance for applications concerning nutrient supply and protection of the environment in agriculture. Important EU policies were deliberated, with a particular reference to the European Green Deal as its first priority, as well as important strategies related thereto indicating possible avenues of the future for the RUSTICA concept.

Finally, the environmental and economic analysis of 6 technology solutions: CAP (Carboxylic Acid Platform), microbial cultivation, electrodialysis, insect cultivation, biochar and composting for RBBFs production started. The evaluation of RUSTICA technologies and accompanied value chains to transform the agricultural side streams into environmentally and economically viable RBBFs will continue until the end of the project.

Our team

particula group
CREATING LONG TERM VALUE

Danijela Dobrovic

Danijela's main responsibility is to support sustainability engineers by assisting in the management and implementation of sustainability strategy and environmental procedures. She also assists with the preparation and production of sustainability reports, monitoring, and reporting on project progress, as well as being responsible for project dissemination; building an online presence through the creation and dissemination of multimedia content online.

Dominik Jasinski

Dominik Jasiński received his Engineering Doctorate degree in 2019 in sustainable materials and sustainable manufacturing. Dominik is an experienced R&D engineer with a rich history of working on international projects in the area of circular economy and sustainable development. He was responsible for managing and leading work packages in many projects co-financed from the Horizon 2020, Seventh Framework, Life and Innovate UK programmes. Dominik has an extensive expertise in the development and application of sustainability assessment methods and techniques, including product Life Cycle Assessment, Life Cycle Costing and Social LCA. He will be supporting RUSTICA project by running the techno-economic analysis, as well as ecological and social impact assessment, of RUSTICA products and processes. He is also responsible for the technical coordination of tasks and activities in work package 3 (systemic feasibility assessment).

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Business model development (WP4)

Work package 3, led by CREA, will guide and monitor the work carried out in the regional networks for the development of business models. This will make the project fully operational along a participatory path that would allow various stakeholders to share the vision of the project. It will implement an action plan to attain business models suited to regional situations and introduce a shared vision for the use of residual biomass and the development of future scenarios based on market analysis.

CREA is actively participating in project general assembly and work package meetings as well as in knowledge brokers trainings. Regarding region description and market analysis, CREA participated with inputs and data processing about the regional context.

Regarding to legal analysis and (organic) farming regulatory framework, CREA participated in the first meetings about the topic. With respect to the development of future scenarios, CREA prepared and submitted a report on future scenarios. Literature (papers, European projects) was analysed, the most relevant drivers/trends were identified and a discussion with experts and RUSTICA partners was conducted during June and July 2021. In addition to this, a first regional workshop was organised in October 2021 in Friuli-Venezia Giulia. Data from the market analysis and from the description of the study areas of the project (work package 3) were used as inputs for building up regional scenarios. Data coming from regional reports are being used as well to define trends and scenarios.

Finaly, CREA is also partticipating in business model development, CREA prepared and submitted two deliverables: one on preliminary and potential business models and a draft for the 5 regional business models.

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Our team

Claudio Mondini

Claudio is a researcher in soil and environmental sciences at the Branch of Gorizia (Italy) of the Research Centre for Viticulture and Enology belonging to CREA. His major expertise is in the area of sustainable recycling of organic residues, soil microbiology and assessment of soil fertility and quality. In the last years, he has specialised in the study of GHG emissions and C sequestration potential in soils treated with exogenous organic matter. Claudio developed a version of the RothC soil organic C model specifically suited for amended soils.

In RUSTICA, Claudio will be the person in charge of the project for CREA, involved in the activities of work package 7 dealing with the characterisation of the innovative fertilisers and in the laboratory and field trials aimed to the agronomical and environmental evaluation of the fertilisers and their mixtures. He will also collaborate on the activities of work package 5 and work package 6 providing useful information for the implementation, integration and demonstration of the new technologies for crop waste valorisation.

Federica Cisilino

Federica Cisilino is a researcher and the coordinator of the Friuli-Venezia Giulia headquarter at CREA-PB. She is an experienced agricultural economist, specialised in statistical-economic analysis of micro-economic data (FADN), with a special interest in the relations between farming and the environment, organic farming, innovation and training. Expert of Research and Innovation for the Italian Ministry of Agriculture and University Lecturer at the University of Udine. She is involved in several research projects both at national and regional level, in charge of some related to specific agricultural sectors, agri-environmental/climate and sustainability issues, CAP reform and rural development policies. During the last years, she has worked on rural development measures' impact assessment using both quantitative and qualitative methods in the context of the Italian Rural Network activities and research projects. Thematic experience relates to agri-food chains, agri-environmental collaborative projects and participatory approaches for sustainable innovations.

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Carla Abitabile

Carla Abitabile is senior researcher at CREA–PB. Trained in agricultural economics and policy, during the first part of her career she worked in the context of the Agricultural Accounting Information Network (FADN), of which she has been responsible for about ten years. In this context, she participated in national and international projects for the exploitation of micro-economic data for the evaluation of agricultural policy and for macroeconomic purposes. Currently, her areas of interest and research are related to the sustainability of agro-food, to organic agriculture, to the processes of farms internationalisation, to the evolution of policy related to these issues. Among others, she has also been involved in research projects on green chemistry.

Andrea Arzeni

Andrea is a researcher in agricultural economics at CREA-PB. His main fields of research are regional analysis of agriculture and agricultural policies, assessment of the efficiency and effectiveness of rural development measures, regional planning with reference to rural territories and environmentally sensitive areas, and farm and co-operative management.

He is the project reference of the business system area of CREA-PB and he is involved in the Italian Rural Network coordinating two work package tasks, on organic farming (RDP M11) and training actions (RDP M1).

In RUSTICA Claudio is particularly interested in developing business models and in evaluating innovation adoption to support entrepreneurial strategies and territorial development. Claudio can also contribute to the multi-actor approach, analysing stakeholders' issues and needs, especially for dissemination of innovations and training of management skills.

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Technology optimization (WP5)

TNO is a technical partner within the project whose main task is to provide good quality biochar made from ligno-cellulosic bio-residues (dry and fairly 'woody' biomass residues). The biochar is one of the ingredients for the circular bio-based fertiliser to be developed within RUSTICA.

Biochar is a charcoal-type product, with a porosity very similar to the original biomass feedstock and most of the nutrients were contained in the plant-residue. Especially, K, Ca and P are present as well as nearly all micronutrients. Of the main fertiliser elements only the nitrogen has been greatly reduced and the carbon content significantly increased, whereby the carbon also has become more stable. The functionality of the internal porosity is diverse but encompasses water-holding capacity and shelter for soil life. The stability of the carbon allows it to be used as a carbon storage option while still playing a role in improving the soil texture and functionality while holding (slow-release) nutrients.

TNO has various facilities for making biochar. Within RUSTICA, a small-scale screw-feeder pyrolysis/gasification unit is used for an elaborate program of using many different plant-residues as feedstock materials in work package 5. The materials used range from many fruit-tree clippings (apple, pear, grape-vine, pistachios, almonds and olive trees) to greenhouse residues (sweet pepper and egg-plant stems and leaves) to more exotic residues from our Colombian partner (cocoa-shells, cacao-pods and coconut-residues). For the larger volumes available locally in the Netherlands we look at wood residues from, for example, willow and the sieving residue from the composting process.

A larger scale installation at TNO (20-40 kg/h input) will be used to provide sufficient volumes for the tasks in work package 6 and work package 7 as part of the fertiliser to be used in the pot trails and regional testing.

This larger scale installation is a grate-type gasifier which is envisaged to go to the market in the next few years. All biochars, both from the small and larger-scale installations, are extensively analysed to make sure they are of excellent quality and easily pass the criteria required for application in agriculture.

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Our team

Rianne Visser

Rianne Visser has 25 years of experience in bio-energy from biomass and residues and the production of biochar. The early experience was on the inorganic problems that arise in thermal installations such as condensation of salts, formation of melts and fouling in general which lead to corrosion, downtime and failure in thermal installations. From this knowledge and a decade of experience came the realisation that the elements causing the problems in energy generation would be valuable fertilising elements in agriculture.

Within the RUSTICA project she can optimise smaller batches of biochar to both a high quality and optimised functionality, depending on the aimed use and provide larger quantities of biochar for the pilot work. The use of biochar in agriculture serves more functions than that of a slow-release fertiliser. When optimised, it can partially replace the role of soil organic matter in water holding capacity and adsorbing nutrients to prevent them from leaching to the groundwater.

Integration and demonstration (WP6)

Work package 6 is led by DRANCO. The goal of the RUSTICA project is to develop and test bio-based fertilisers. This fertiliser will consist of 5 specialised building blocks (microbial biomass, nutrient concentrate, insect biomass, insect frass and biochar) and compost. These building blocks will be developed by 5 different technologies: carboxylic acid platform (CAP), microbial protein (MP) production, electrodialysis, insect cultivation and pyrolysis.

To demonstrate the technologies and produce the required amount of building blocks, 4 pilot plants in 4 different regions will be designed and built. For the production of insect biomass and insect frass, two pilots will be built: one at Tecnova in Almeria (Spain) and one at CIAT in Colombia. The first designs for these pilots have already been made by Entomo, keeping in mind the different environmental conditions within these regions. They will be able to start building the plants in early 2022.

TNO, a company specialised in biochar production located in the Netherlands, already built a pilot plant in the past. This plant has been modified, addressing the needs of the RUSTICA project. Hence, its design is already finished and the site is ready for production.

The fourth pilot plant will be at DRANCO in Ghent, Belgium. This plant will consist of 3 technologies: carboxilic acid platform, microbial protein production and electrodialysis. The carboxilic acid platform solution is the starting material for both the microbial protein production and the electrodialysis. Adaptations, such as the removal of calcium-rich substances, have been made so that the carboxilic acid platform production process suits the needs of the other technologies. Experiments are being scaled up successfully and lab experiments in which the technologies are cascaded show promising results. Based on these experiments an integration strategy will be devised.

Our team

Jef Van de Poel

Jef Van de Poel is Master of Science in Bioscience Engineering with a specialisation in Chemistry and Bioprocess technology at Ghent University. Jef is project engineer in the Biogas Consulting and Support team of DRANCO, where he is responsible for research projects related to the carboxylic platform with a focus on downstream processing. For the RUSTICA project, he will mainly participate in work package 5 and work package 6, in addition to assisting Nathan Deman in his role as project technical manager. Specific for work package 5, he will develop the carboxylic acid platform with focus on maximal nutrient recovery next to a high carbon recovery efficiency. For work package 6, he will work on the integration and demonstration of the innovative RUSTICA technologies for the pilot plant in Ghent.

Nathan Deman

Nathan Deman graduated as a Master of Science in Biochemistry and Biotechnology at the Ghent University, with a major in the Plant Biotechnology and a minor in the Microbial Biotechnology. In August 2021 he joined the Biogas Consulting and Support (BCS) team of DRANCO-nv, where he will participate in R&D projects concerning the Carboxylic platform. For the RUSTICA project, he will mainly be involved in work package 5 and 6. For WP5, he will optimise the carboxylic acid platform to maximise nutrient recovery while maintaining a high carbon recovery efficiency. For work package 6, he will work on the development of the pilot plant in Ghent to demonstrate the RUSTICA technologies.

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Fertiliser blending and validation (WP7)

Work package 7 concerns the making, the verification and the practice validation of the so-called RUSTICA bio-based fertilisers. Looking at the value-circle of organic matter, work package 7 has the responsibility from the moment the building blocks are produced and up to and including the moment of application of the bio-based fertiliser (combination of at least two building blocks) in the field, including the resulting crop performance.

The essence of circular fertilisers is that organic waste from fresh and food chains is converted to a high standard. We have opted for vegetable waste streams, i.e., no animal material because this is difficult in terms of legislation, but also, because it is more pleasant for market positioning and contributes to a sharper product profile.

The building blocks obtained as outcome of the key technologies in work package 5 and work package 6 will be analysed for their composition and characteristics and categorised for hypothetical agricultural and environmental value (nutritional, plant protection, soil quality) and combined to hypothetical blends which will be benchmarked against current blends. The building blocks will be characterised for a couple of the following parameters: humidity, ashes, organic matter content, pH, conductivity, total organic C, total N, water soluble C and N, NO3-, NH4+, P2O5, Ca, Mn, Mg, micronutrients and other relevant parameters. Laboratory incubation of soil treated with separate fertiliser products will be performed for characterisation in terms of degree of degradability (CO2 emissions) and nutrient availability (NO3-, NH4+, available P). In an iterative process at the level of work package 7 a final selection of parameters to be analysed was made. Additionally, the building blocks will also be screened for potential contaminants (heavy metals, pesticide residues, pathogens, etc.) and a risk assessment and mitigation strategy will be developed.

RUSTICA bio-based fertilisers design is based on the customer wishes from the regions where the desired soil functionalities of the RUSTICA bio-based fertilisers are formulated in combination with target crops, properties of the receptor soil and agricultural management such as crop rotation. With this aim in mind, a questionnaire was created to assist the regions in formulating the customer's desires.

Based on the regional customer wish and the analysed characteristics of the building blocks, blends/RUSTICA bio-based fertilisers are composed with hypothetical properties. In standard experiments the assumed properties will be verified.

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Our team

Daan Kuiper

RUSTICA brings everything together Daan experienced and learned before. Being a PhD biologist focussed on plant physiology, Daan worked as a teacher for two years followed by positions at the Research Station for Floriculture and the Centre for Agrobiological Research (Wageningen). After 10 years horti/agri he switched to the business as R&D Head of Grodan (stonewool substrates) on the cutting edge of sales and product development; getting skilled in proces- and project management and predictive innovating under pressure. Five years later Wageningen called on him to become business unit manager Greenhouse Horticulture: an energetic time bringing the unit in the modern time (change management). After ca. another 5 years Daan quitted and became head of the Nutrient Management Institute and at the same time he started his own company CropEye; core activities are project initiation, project direction in the agribusiness, bridging the gap between business and knowledge providers.

RUSTICA, a European research innovation project involving university researchers, academia, consultants, scientists, businesses and farmers.

Communication, dissemination and exploitation (WP8)

Work package 8 is led by IDConsortium. The main goals of this work package are:

- Increasing the visibility of the application of RUSTICA project technology at full-scale in the agri-food industry, research organisations, end-users like farmers and farmers associations, small rural businesses, technology providers and policymakers, among others.
- Sharing the knowledge and results through internal and external communications with consortium partners, the European Commission and stakeholders.
- Managing the expected wealth of information generated in the project in a fair and transparent manner for the consortium and supporting an adequate knowledge transfer to the stakeholders.

Among the tasks that will be undertaken in work package 8 are:

- providing a set of communication and dissemination activities to sustain a long-lasting visibility of the project,
- implementing a strategic plan and
- collaborating with other global partners and consortiums with similar interests.

All activities, plans and actions taken will be actively monitored and assessed for their effectiveness to ensure that internal and external stakeholders are well informed about the status of the project. A final conference will be held at the end of the project to communicate and disseminate the project's results.

During 2021 several activities have been undertaken. Regarding the communication and dissemination activities:

- A strategic plan for communication and dissemination of project results has been delivered.
- The RUSTICA project website was designed during the first quarter of 2021 and launched in March. Thanks to the close collaboration with RUSTICA partners, the RUSTICA website is becoming a large repository containing the main information and activities of the project.
- Social media profiles have been created on YouTube, LinkedIn, Facebook, Twitter and Instagram to inform the different audiences about the ongoing activities and events, the development of the project
- The first project video was produced in October and it is available in English with subtitles in English, Dutch, French, Italian, German and Spanish.

With respect to Exploitation and IPR management of project results, the following tasks and activities have been done/delivered during 2021:

- An Exploitation and IPR plan has been delivered.
- Meetings with partners on IP management are ongoing.
- Furthermore, ID Consortium is facilitating the collaboration with other EU projects and EIP-AGRI activities.

Our team

Macarena Sanz

Macarena Sanz received her Agricultural Engineer degree from University Politécnica in Madrid and her Executive Master in Business Administration from IESE in Madrid.

Her working life began at Accenture where she worked as a consultant. After almost 5 years of working in international consulting on projects for clients such as EADS and BP, she joined the IDAction team and founded IDConsortium. The main motivation to take this leap was to bring interesting international projects like the ones she had experienced in Accenture to Andalusia (her homeland). Within the first 3 years, she won 2 relevant European projects for the region, Fertiplus, and Fuel4ME. Now, Macarena is the managing director of IDConsortium.

She is a mother of two amazing children of 4 and 6 years old and her family is her passion and number one priority in her spare time. She also has several hobbies such as swimming, Easter week in Seville, skiing, gardening, flamenco dancing, reading, traveling, photography, playing guitar, and going to the cinema.

Álvaro Tamayo

Alvaro Tamayo is Project Manager at IDConsortium. He graduated as a geologist at the Complutense University of Madrid. After extensive experience leading fieldwork campaigns as geologist with international experiences in France, Chile and Tanzania he has been working as grant proposal writer. He has been involved in the management of several EU projects in H2020 over the last years. His deep background in coordinating several collaborative projects under the framework of the Fast Track to Innovation call, provided him with important skills to coordinate multidisciplinary projects.

Belén Benito

Belén is Communication manager at ID Consortium. She holds a BA in Philosophy at Complutense University and finished the two last years at Humboldt University zu Berlin. She holds a MA in Political Philosophy at Complutense University and a MA in Teaching Spanish as a Foreign Language at Alcalá de Henares University.

She has worked in different EU institutions: DG EMPL and EUIPO. At DG EMPL she did audit work in the European Social Fund Audit Unit dealing with the evaluation of projects related to ESF and ERDF. In EUIPO she worked for 7 years in the Business Communication Service, dealing with a wide range of tasks related to publications, translation workflow management, project management, coordination, translation revision and IP tasks. She was author of Spanish teaching materials for the websites: Babbel and Dalango and she worked as a Spanish teacher at Carlos III University.

She has a C1 certified level of English, French, German and she is expert in Spanish.

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RUSTICA

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

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https://www.linkedin.com/company/rustica-eu-project/

YouTube

https://www.youtube.com/channel/UC94-gXXGHNEBDxkjnVMe4Cw

RUSTICA Consortium

KU LEUVEN

AGRICULTURES & TERRITOIRES
CHAMBRE D'AGRICULTURE PAYS DE LA LOIRE

DRANCO

crea
Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria

Wiedemann GmbH
Bio-based Advancement

Avecom
Bioproducts & Apps

Alliance
Bioversity International
CIAT
International Center for Tropical Agriculture
Since 1967 Science to cultivate change

crop eye
Dare to share

particula group
CREATING LONG TERM VALUE

ID consortium
Just research it!

ILVO
Instituut voor Landbouw-, Visserij- en Voedingsonderzoek

Bio Sabor

TNO innovation for life

UNIVERSITEIT GENT

tecnova
CENTRO TECNOLÓGICO

entomo
agroindustrial

RUSTICA

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

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