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Launching EXCALIBUR trials in strawberry fields

A major aim of EXCALIBUR Project is to test the bio-inocula under realistic agronomic conditions in field trials. At University of Copenhagen in Denmark, three different granular fungal inocula arrived in April from the partners Inoculum Plus in France and KIS in Slovenia, and these bio-inocula are prepared for application to strawberry plants in integrated and organic production systems. “It is critical to evaluate the bio-inocula developed in EXCALIBUR at field scale in different countries and under different climatic conditions to test the versatility and robustness of the beneficial microbial solutions”, says Nicolai V. Meyling, associate professor at Department of Plant and Environmental Sciences, who is responsible for carrying out the strawberry field trials in Denmark. “Fungal applications to root systems of crop plants can have profound effects on plant growth as well as on the ability of plants to cope with pests and diseases' , he adds. “We will evaluate the potential benefits of the applications on overall plant establishment, flowering, fruit production and quality of berries over the coming seasons across partner countries as well as assess impact on pests and disease incidence of the plants''. In addition, the effects of bio-inocula applications with integrated and organic management practices on the dynamics of microbial and invertebrate diversity in the soil will be assessed over time in all field trials of EXCALIBUR.

Photo 1: Mads Nielsen & Nicolai V. Meyling, University of Copenhagen, Denmark. Photo: Karen Rysbjerg Jensen

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 817946.

Photo 2 Strawberry plants
Photo: Karen Rysbjerg Jensen

Specifically, the beneficial fungi *Clonostachys rosea* and *Metarhizium brunneum* are applied to the strawberry roots for protection against root pathogens and insect pests. While having a bio-control function, these fungi may also contribute to improving plant growth and reduce establishments of foliar pests, as shown in previous research. Likewise, mycorrhizal fungi mainly work as bio-fertilizers by provision of nutrients to the plant, but these fungi may also have an impact against attack by insect pests. A granular mycorrhizal product is applied to strawberry roots in different countries in EXCALIBUR, including Denmark. "We are interested in evaluating the long-term effects on productivity and pest incidence at field conditions of the beneficial fungi. Although such dual effects are shown with these fungi in shorter term greenhouse experiments, it is rare to have the scale in space and time of EXCALIBUR to test these effects under commercial agronomical regimes", Nicolai V. Meyling explains.

In Denmark, the strawberry fields hosting the field trials were planted in April 2021 and the plants will establish over the first year to produce fruits in 2022-2023. The fungal applications are performed soon after planting for the beneficial microorganisms to establish close associations with the root systems at an early stage, while data of the effects will be collected over the entire cropping cycle. "The coming period will be busy with finalizing the set-up in the strawberry fields. We are looking very much forward to following plant responses while growing and for evaluating next season's flowering and fruit production as well as communicating the activities and results of the EXCALIBUR project to stakeholders", Nicolai V. Meyling adds. Partners in Poland, Slovenia and Italy will also evaluate bio-inocula in strawberry fields, but in these countries the planting occurs later in the season than in Denmark, as regional agronomical practices vary. It is important to assess the effects of the treatments at the conditions and practices used by growers to maximize the translation and relevance for horticultural production across Europe. The results are expected in the coming years, but the spring of 2021 marks the launching of EXCALIBUR field trials.

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About EXCALIBUR:

EXCALIBUR is an international research project financed by the EU Research and Innovation Programme Horizon 2020 led by the Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (CREA) - Italy, which started in June 2019. With the aim to initiate a biodiversity-driven change in agricultural soil management practices the project received 6.995.197,50 € in funds and brings together 16 European partners. Over a five-years timeline, the researchers will explore how crops, soil and microorganisms interact. The gained understanding will promote a more effective use of biopesticides and biofertilizers for long-term productive and sustainable practices in horticulture.
If you would like more information about this project, please contact the Coordinator Dr. Stefano Mocali at (email: stefano.mocali@crea.gov.it), or learn more on Facebook, Instagram, Twitter and the EXCALIBUR homepage.

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