TITLE: Development of strategies for the use of rhizosphere microorganisms to reduce the input of fertilizers and to control biotic and abiotic adversities: experience of the FERTLESS Project.

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ABSTRACT:

The attention to environmental protection and soil biodiversity has driven the need to identify new tools for reducing the use of technical means by agricultural producers within the agri-food chain. The use of natural biostimulants like beneficial rhizosphere microorganisms could limit the supply of fertilizers or pesticides and the release of pollutants, improving crops resilience to water and thermal stress; as a result, the adaptation of cropping systems to the impact of climate change might be achieved, preserving and implementing safeguarding yields, quality and profitability of harvest. The FERTLESS Project, funded by Emilia Romagna Rural Developing Program (PSR 2014-2020), aims at defining a best practice model with low environmental impact applicable at farm level, which includes the use and valorization of rhizosphere microorganisms for the cultivation of economically prominent crops in Emilia Romagna Region; in fact, an agricultural system addressed to the reduction of pesticides and fertilizers is expected to obtain the recognition of an added value on the markets, operating an important function in terms of food safety and consumer awareness. As well, best practice models could allow new market opportunities linked to the ever-increasing appreciation for agricultural products made with more environmentally friendly techniques, also solving the following problems:

1. development of low-impact strategies to reduce/replace synthetic fertilizers and pesticides, ensure greater safety of workers and improve the consumers health;
2. achievement of increased yields and improved quality of food and feed products;
3. economic and environmental savings due to the lower use of technical means and water resources.

Activities are focused on the validation of new biofertilisers applied as seed coating or microgranular product. Their effects have been evaluated in terms of different agronomical parameters to assess the efficacy in ameliorating the plant resilience to abiotic stresses; investigations have been performed in laboratory conditions and experimental fields.

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