



Coop Research Program | Call 6

Optimizing organic bean production through agroecosystem diversification

Background

Agroecosystem diversification is frequently named as one of the most promising methods for sustainable intensification of agricultural food production. Intercropping can benefit from reduced competition through complementary resource use and facilitative interactions, especially if legumes make atmospherically fixed nitrogen available to the other intercropped species. Common bean (*Phaseolus* sp.) is an important grain legume and protein source for human consumption worldwide and, therefore, a high nutritious premium commodity.

Objective

The main project objective is to quantify the impact of different agroecosystem diversification strategies and irrigation intensities on ecosystem function and services. The transdisciplinary research project will allow the identification of a suitable diversification strategy for a socio-economically viable, sustainable intensification of organic *Phaseolus* bean production in North Macedonia by involving local key stakeholders.

Research Approach

The project will be initiated by a stakeholder workshop in North Macedonia to identify local, critical knowledge. Greenhouse experiments will then be conducted to test the potential diversification measures for increased productivity. After consultation with the stakeholder community, the most promising bean-based mixtures will be tested in a participatory farm trial. The outcome of the study will be communicated to the local and wider stakeholder community.

Relevance and Expected Outcomes

This project expects to provide recommendations to the stakeholder community of suitable diversification and irrigation measures for a sustainable intensification of bean production. Based on the model system of *Phaseolus*, it is expected to understand the mechanisms underlying the effects of different diversification measures on productivity, such as changes in competition and facilitation intensity from monocultures to mixtures.

Food System Challenges Addressed

Crop diversification, Intercropping, Irrigation, Mixture and monoculture cropping, Sustainable food production.

<https://worldfoodsystem.ethz.ch/research/research-programs/CRP/DiverBeans.html>

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Project Duration 2019-2021

Project Cost 299'673 CHF

Funding WFSC Coop Research Program