

## **Evaluating the Effect of Soil Management Practices (Tillage and Cover Crops) on Arbuscular Mycorrhizal Fungi in the Soil**

**Start Date:** Mid-February 2025

**Location:** Wiesengut, the organic agricultural teaching and experimental facility of the University of Bonn in Hennef for field work and Auf dem Hügel 6, Bonn for lab work.

### **Background:**

Arbuscular mycorrhizal (AM) fungi form symbiotic relationships with plants. They require plant carbohydrates and provide the plants with several benefits such as greater access to nutrients and tolerance to stress. AM fungi colonize plant roots and develop extensive networks of fungal filaments (hyphae) through the soil that form extraradical mycelia (ERM). ERM present an effective source of AM fungal propagules, facilitating fast root colonization of establishing plants. Agricultural practices, particularly conventional tillage, disrupt ERM. Further, the mycorrhizal status of cover crops likely affects ERM. Specifically, cover crops that associate with AM fungi, such as black oat, likely maintain ERM unlike non-mycorrhizal cover crops, such as oilseed radish. This project aims to evaluate the impact of soil management practices on AM fungal hyphal density to better understand how we may leverage the AM symbiosis for enhanced crop performance.

### **Research Question:**

Do tillage and cover crops affect AM hyphal density in organic faba bean fields?

### **Activities:**

You would join an ongoing research project examining the role of ERM in enhancing faba bean tolerance to insect pests.

#### Field work

- Soil sampling at key growth stages: baseline (before planting), two weeks after planting, during flowering, and at harvest.

#### Laboratory work

- Extracting AM fungal hyphae using the wet sieving and vacuum filtration method and quantifying under a microscope.

### **What's Required?**

- No prior knowledge or experience is needed. Training will be provided.
- A willingness to work outdoors in the field and carry out hands-on tasks is essential.
- Field work may require adjusting to weather conditions or schedule changes.

### **Contact:**

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