

## Popular scientific project description for project funded by Ekhagastiftelsen

Popular scientific project description is to be submitted within 2 months of project grant.

Application number:	2025-69
Project title:	Harnessing Root System Dynamics to Unlock Cereal-Legume Intercropping Partnerships in Organic Agriculture (InterRoot)
Receiver of grant (name, address):	Jonathan Cope Sveriges lantbruksuniversitet Institutionen för växtproduktionsekologi Ulls väg 16 756 51 Uppsala
Contact / project manager:	Jonathan Cope
Project start (yyyy-mm-dd): *	2026-01-01
Project end (yyyy-mm-dd): *	2028-03-31
By Ekhagastiftelsen granted sum:	1,555,000 SEK

Project description: (200 - 300 words)

Conventional farming boosts yields with synthetic fertilisers and pesticides, but at high environmental and economic costs. Organic farming avoids most of these inputs and instead relies on natural processes. However, today’s cereal and legume varieties were mostly bred for high-input systems, so they often yield less under organic conditions – creating an “organic yield gap”.

One promising solution is **intercropping**: growing two or more crop species together so they can support each other, for example by using nutrients more efficiently or reducing pests and weeds. Most research has focused on what happens above ground, such as how plants share light. The **InterRoot** project instead looks below the surface, at how roots interact.

Roots determine how plants access water and nutrients, shape soil life, and influence soil structure. Different root systems may explore different soil layers and reduce competition. Importantly, not all varieties of the same species behave the same way. Their root shapes, angles and growth timing can vary a lot, and this hidden diversity may be key to better organic intercropping.

InterRoot will screen many modern and heritage cereal and legume varieties grown in Sweden, in both controlled experiments and organic fields near Uppsala and on Öland. We will measure root growth, nutrient uptake, yield, grain protein, and more, across different soils and climates.

By identifying the best “root partners” and the traits that make them work, InterRoot aims to give farmers and breeders concrete variety combinations that raise organic yields while reducing dependence on external inputs.

<https://www.slu.se/en/research/research-catalogue/projekt/i/interroot/>

\* Dates for project start and end should be the dates for which the grant is received (Not dates for total project if longer than period for which grant is received)