

Hutton scientists highlight root-soil science in European crop breeding debate

08 October 2026 | News

Scientists from The James Hutton Institute will present new research on root-soil interactions at the European Parliament on October 12, highlighting how below-ground traits could help breed crops that use resources more efficiently and withstand climate stress



Scientists from The James Hutton Institute will take their latest findings on crop roots, soil interactions and breeding to the European Parliament on October 12, as policymakers, researchers, breeders, farmers and industry representatives examine how scientific advances can be translated into practical agricultural solutions.

The policy session is being organised through the Horizon Europe projects Root2Res and BarleyMicroBreed. The discussions will focus on the role of root systems and soil biodiversity in developing crops capable of maintaining productivity under drought, nutrient constraints and other environmental stresses.

Professor Tim George, Director of the International Barley Hub hosted by the Hutton and Deputy Coordinator of Root2Res, will introduce the projects and contribute to discussions linking food security with soil biodiversity.

“As climate change places increasing pressure on agricultural systems, it is important that we discuss with policymakers the need for crops that can maintain productivity while using resources more efficiently,” George said. “Understanding how roots interact with soils and beneficial soil organisms gives us new opportunities to breed crops that are more resilient to drought, nutrient limitations and other environmental stresses.”

He added that evidence generated through Root2Res and BarleyMicroBreed shows how investment in root-focused research and breeding could deliver practical benefits for farmers, food security and environmental sustainability.

Crop breeding has traditionally placed greater emphasis on above-ground characteristics such as yield and disease resistance, partly because root systems are considerably more difficult to study. Researchers are increasingly looking below ground, however, as roots influence how efficiently crops access water and nutrients, tolerate environmental stress and contribute to soil carbon storage.

The two projects have developed policy recommendations aimed at accelerating the development and adoption of crop varieties that can use natural resources more efficiently without compromising productivity. Their recommendations are aligned with the European Commission's Strategic Approach to Research and Innovation and broader ambitions outlined in its Vision for Agriculture and Food.

Root2Res involves 22 partners across the European Union, United Kingdom, Switzerland, Morocco and South Africa. The project is developing tools and breeding approaches to improve crop tolerance to abiotic stresses while increasing the potential for carbon sequestration.

Its research covers barley, potatoes, faba bean and sweet potato, with scientists developing advanced root phenotyping technologies, genetic tools and modelling approaches to help breeders identify varieties better suited to challenging growing conditions.

BarleyMicroBreed complements this work by examining how barley interacts with naturally occurring soil microbiomes. The project is investigating breeding strategies that can harness beneficial soil microbial communities to improve drought resilience and resource-use efficiency.

Together, the initiatives are building a case for giving below-ground traits and soil biodiversity a more prominent role in crop improvement and agricultural policy. The European Parliament session will bring the research directly into discussions with Members of the European Parliament and European Commission representatives on how research and innovation can contribute to a more resilient and sustainable European food system.