

Exploring the role of roots in sustainable agriculture and land management



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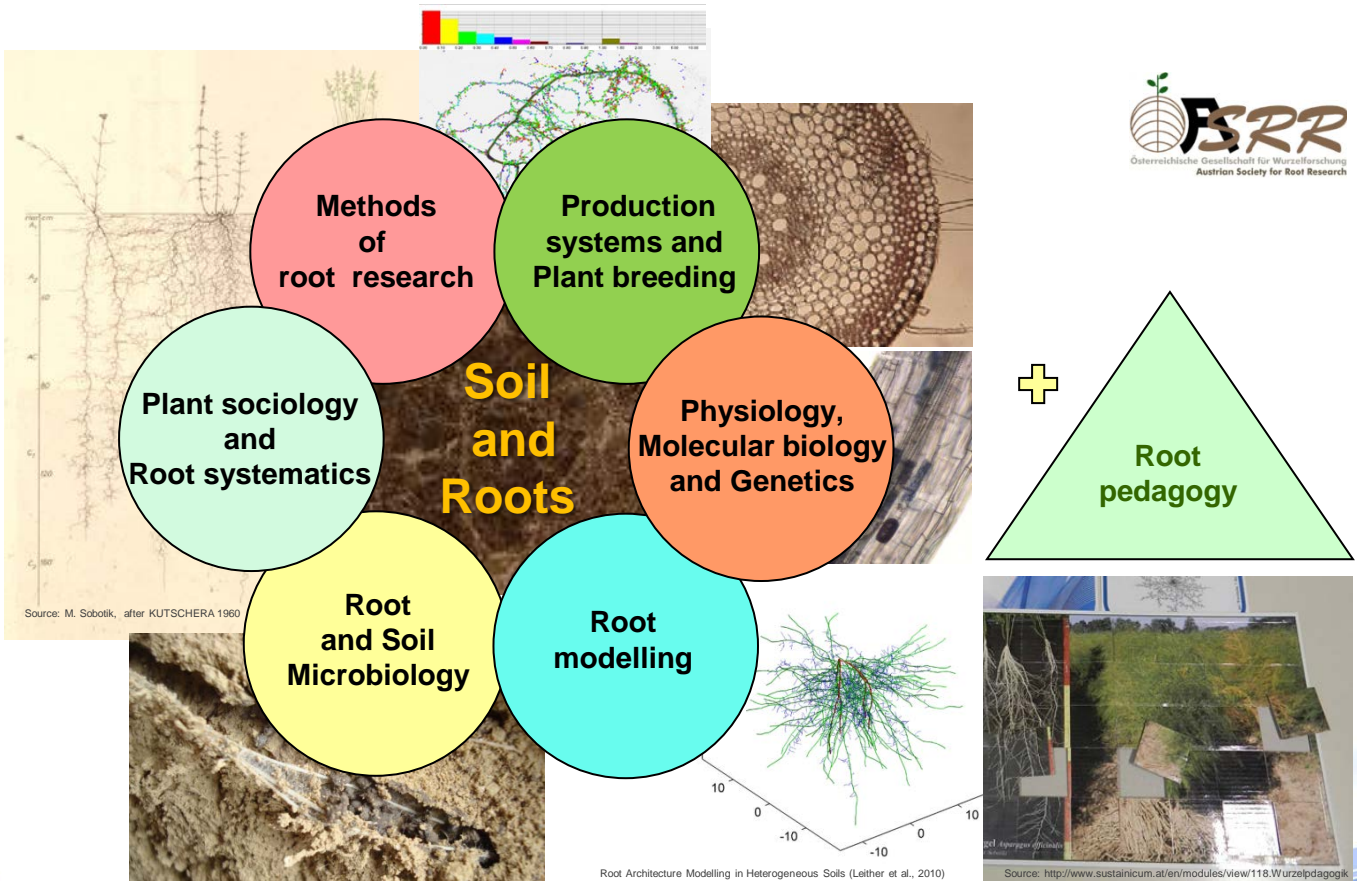
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Roots as an interface between the soil and plants

Roots form dynamic biological interfaces between soil and plant that essentially determine water and nutrient flow in the soil-plant-atmosphere continuum. As important modifiers of the soil pore system, plant roots also influence soil hydraulic properties controlling water and solute movement in the field. Due to their hidden but highly heterogeneous and dynamic nature, plant roots are still a research challenge for sustainable agriculture and land management.

Root management for sustainable land use and water quality

The interlinked aspects of root management in modern agriculture for sustainable land use and water quality depend on process understanding and descriptions. Specific farming practices such as crop rotations, conservation tillage, etc. addresses the role of roots in promoting an eco-balance approach for enhanced system productivity, valuable adaptation to stress-prone sites and environments, and sustainable use of natural resources.



➡ **Final users:** agriculture, landscaping and risk assessment, ecosystem services, schools, etc.

Fig. Working groups of the Austrian Society of Root Research (ASRR) and the provided interdisciplinary research

Based on the current actions, we define **key tasks of root research for increasing water and nutrient use efficiency:**

- ▶ gaining a **clear scientific view on the up-to-date state of knowledge on root hydraulic traits;**
- ▶ **identification the existing knowledge gaps and setting the research priorities;**
- ▶ **development of advanced measurement and modeling approaches to bridge these gaps;**
- ▶ **outlining the expected outcomes**

for better agricultural land management and risk assessment, as well as sustainable use of natural resources.