



Solutions for improving Agroecosystem and Crop Efficiency for water and nutrient use



Addressing reduced water and nutrient availability through improved crops and agricultural management

European agriculture is challenged by the need to produce more crops whilst tackling reduced availability of fertilisers, in particular nitrogen (N) and phosphorus (P), combined with reduced or more variable rainfall, which impacts soil water availability. The SolACE project will identify and test novel solutions for improving agroecosystem and crop efficiency for water and nutrient use. These innovations aim to ensure optimum crop productivity under combined water and nutrient (N or P) limitations.



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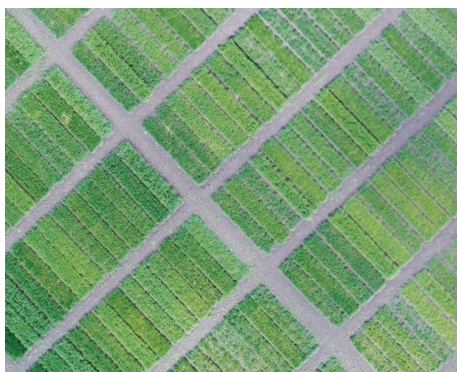
www.solace-eu.net

Project aims and work

- > Assess the present day and future scenarios of combined water and nutrient (N and P) stresses in various regions in Europe;
- > Identify above- and below-ground plant traits that improve the efficiency of water and nutrient (N and P) use;
- > Assess agroecosystem management innovations that can improve the efficiency of water and N and P use on-farm;
- > Evaluate breeding strategies that can help to respond to combined shortages in water and nutrients (N and P);
- > Evaluate proposed innovations with farmer networks to assess local solutions and barriers for their uptake;
- > Disseminate the findings of SolACE to a broad spectrum of stakeholders, including farmers, farm advisors, agri-business actors and policymakers.

Approaches

SolACE will use a wide range of approaches throughout the project, such as on-farm experiments, field trials at experimental stations and phenotyping platforms.



SolACE will test a range of crop varieties and agricultural management strategies through pilot studies and field trials at experimental stations

Testing innovations with a focus on potatoes, bread and durum wheat

The team of researchers and farmers will test innovations such as crop variety mixtures, legume-based crop rotations, cover crops, microbial inoculants¹, and improved decision support systems to help cope with combined water and nutrient stresses. Furthermore, hybrids or products from genomic selection and participatory breeding activities will be tested to create more resilient plant material. SolACE focuses its activities on three major European crops – potato, bread and durum wheat.

SolACE has access to unique phenotyping facilities to enable the assessment of below-ground traits and interactions



Farmers' networks, on-farm experiments and field demonstrations play an important role in SolACE

¹ Microbial inoculants also known as soil inoculants are agricultural amendments that use beneficial microorganisms to promote plant health or plant growth.

Innovations

- > SolACE will develop microbial inoculants with improved efficiency by innovative formulations;
- > SolACE will develop new hybrids for bread wheat and potato, focusing on combined abiotic stresses in order to go one step further than currently available varieties;
- > As the market for high-quality (organic / organo-mineral) fertilizers is growing steadily; SolACE will assess and refine the agricultural, economic and environmental benefits of the use of new organic / organo-mineral fertilizers, as well as microbial inoculants, in field trials and farmers' networks.

Durum wheat is more and more exposed to water and nitrogen deficits, as illustrated in this field experiment in the South of Italy



Potato production is sensitive to reduced inputs of nitrogen and phosphorus fertilizers.



Bread wheat represents almost 50 % of the European harvested cereal area and production

Outcomes of SolACE

- > New crop varieties, especially hybrids of bread, wheat and potato, and agronomical innovations to cope with combined water and nutrient stresses;
- > Better knowledge and use of N derived from legumes for the next crop in a rotation;
- > Better understanding of below-ground responses to water and nutrient limitations;
- > Tools for the training of farmers and farm advisors on the importance of below- and above-ground processes / traits for resource use efficiency;
- > Below-ground traits introduced as a novel concept for breeders;
- > Co-creation, and co-evaluation of plant material and agroecological innovations with small and large companies;
- > Identification of barriers / drivers for the uptake of agroecological innovations, including at regulatory / legislative levels and dialogue with relevant stakeholders.

Get involved

The SolACE stakeholder forum will be engaged in active dialogue and provide expertise to address key issues. If you wish to join the stakeholder forum please register at www.solace-eu.net/get-involved.html



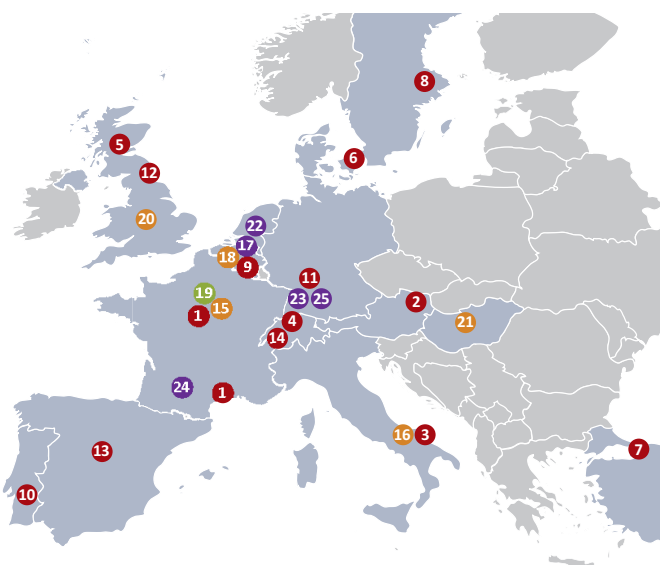
Project info

- > Project title: SolACE - Solutions for improving Agroecosystem and Crop Efficiency for water and nutrient use
- > Funding: Horizon 2020, the research and innovation programme of the European Union, and Swiss State Secretariat for Education, Research and Innovation (SERI)
- > Grant agreement No 727247; SERI contract number 17.00094
- > Project duration: 5 years (May 2017 to April 2022)
- > Number of partners: 25 from 14 European countries
- > Project Coordinator: Dr. Philippe Hinsinger, INRA, UMR Eco&Sols, France
- > Project website: www.solace-eu.net

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Research ●

- 1 INRA
- 2 AIT
- 3 CREA
- 4 FiBL
- 5 JHI
- 6 KU
- 7 SU
- 8 SLU
- 9 UCL
- 10 UE

Industry ●

- 11 UHO
- 12 UNEW
- 13 UPM
- 14 Agroscope
- 17 DCM
- 22 Solynta
- 23 SP
- 24 Syngenta
- 25 Agrobiota

Extension ●

- 15 ARVALIS
- 16 CON.CER
- 18 ECAF
- 20 LEAF
- 21 ÖMKI

Other ●

- 19 IT

Located in 14 Countries

Partners

SolACE is a multi-actor project with 25 research, industry and extension partners in 14 European countries:

- > AIT – Austrian Institute of Technology GmbH, Austria
- > Agrobiota, Germany
- > Agroscope – Federal Department of Economic Affairs, Education and Research, Switzerland
- > ARVALIS – Institut du végétal, France
- > CON.CER – Societa Cooperativa Agricola, Italy
- > CREA – Council for Agricultural Research and Economics, Italy
- > DCM – De Ceuster Meststoffen NV, Belgium
- > ECAF – European Conservation Agriculture Federation, Spain
- > FiBL – Research Institute of Organic Agriculture, Switzerland
- > INRA – French National Institute for Agricultural Research, France
- > IT – INRA Transfert, France
- > JHI – James Hutton Institute, United Kingdom
- > KU – University of Copenhagen, Denmark
- > LEAF – Linking Environment And Farming, United Kingdom
- > ÖMKI – Hungarian Research Institute of Organic Agriculture, Hungary
- > SOLYNTA – Ontwikkelingsmaatschappij Het Idee, The Netherlands
- > SP – Sourcon Padena GmbH, Germany
- > SLU – Swedish University of Agricultural Sciences, Sweden
- > SU – Sabancı University, Turkey
- > SYNGENTA, France
- > UCL – Université catholique de Louvain, France
- > UE – University of Évora, Portugal
- > UHO – University of Hohenheim, Germany
- > UNEW – University of Newcastle – United Kingdom
- > UPM – Technical University of Madrid – Universidad Politécnica de Madrid, Spain

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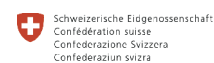
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