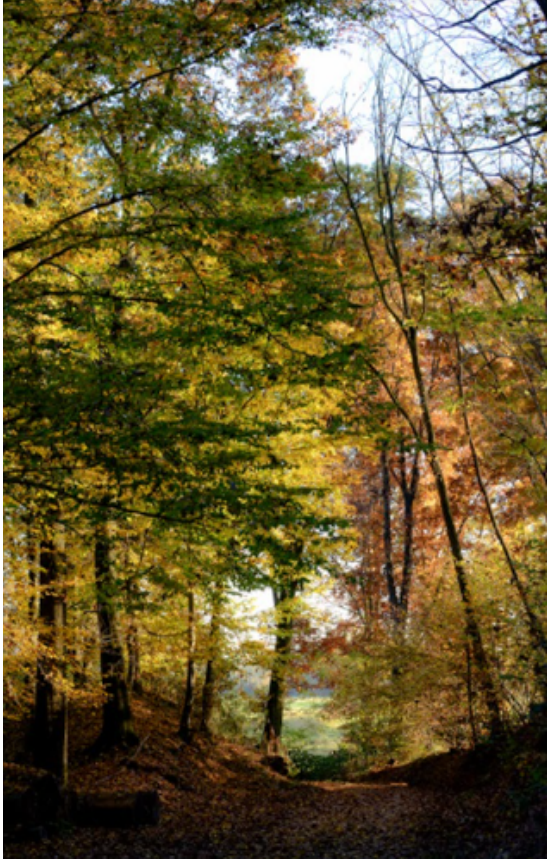



SECOND JOINT MEETING ON SOIL AND PLANT SYSTEM SCIENCES

SPSS2021

20-23 September 2021 | Online - Torino, Italy

SECOND JOINT MEETING ON SOIL AND PLANT SYSTEM SCIENCES

The soil-plant-environment nexus and emerging challenges across terrestrial ecosystems

Società Italiana di Chimica Agraria (SICA)
Società Italiana di Pedologia (SIPe)
Società Italiana della Scienza del Suolo (SISS)

20-23 September 2021 | Online - Torino, Italy

Welcome to SPSS2021

SPSS2021

On behalf of the Italian Society of Agricultural Chemistry (SICA), the Italian Society of Pedology (SIPe) and the Italian Society of Soil Science (SISS), we are delighted to invite you to the Second Joint Meeting on **Soil and Plant System Sciences (SPSS2021)**. The meeting will be held **online** on **20th-23rd September 2021**.

The title of this meeting **"The soil-plant-environment nexus and emerging challenges across terrestrial ecosystems"** sets up the ambitious goal of integrating scientific background, applied research and novel approaches to link soil, plant and environmental aspects over various ecosystems. Physical, chemical and biological properties, mechanisms and processes studied at different scales - from molecular to field - will feed the diversity of experiences, opinions and scientific knowledge.

SPSS2021 aims at bringing together academic scientists, researchers and research scholars coming from the three Societies to exchange and share their experiences and research results on all aspects dealing with soil-plant sciences. The program will provide opportunities for *open fora* and discussion sessions across a wide range of related disciplines.

The scientific program is structured into three sessions covering from forest and semi-natural ecosystems, to human-impacted areas and agricultural systems, over four days. The core program is coupled with a scientific and cultural excursion following the course of water from alpine glaciers to lowland rice paddies.

The organizing committee
Biogeochemistry & Soil Science Group
UNITO, DISAFA

Session 1

SOIL AND PLANT SCIENCES IN FOREST AND SEMI-NATURAL ECOSYSTEMS

After being abandoned for decades, the land used for non-food production are now experiencing new challenges. Forests and forest soils provide a number of ecosystem services and need to be preserved, being they used for wood production or their protecting functions. Nature-like areas range from high-elevation ecosystems to wetlands and coastal areas, from natural parks to pristine environments all over the world, and are nowadays under significant pressure, often enhanced by global change. As examples we may cite the invasion of alien species that affect soil biodiversity and soil-plant feedbacks, the changing hydrological inputs that alter the soil-water cycle and trigger soil erosion, the increase in atmospheric depositions that impact nutrient cycles and availability for plants and microorganisms and, last but not least, the increasing atmospheric CO_2 concentrations with striking consequences on plant productivity, soil organic matter turnover and soil carbon stocks.

In this session we welcome contributions that deal with: 1) soils in forest and nature-like areas, from the challenges of soil mapping in highly variable landscapes to evergreen pedogenic studies; 2) changes in physical, chemical and biological soil characteristics and processes caused by environmental non-anthropogenic stressors; 3) carbon and nutrients dynamics in plants of forest and nature-like areas, including lab simulation experiments and modelling studies dealing with plant-soil feedbacks; 4) losses of soils, nutrients and water from these areas, in whichever form: solid transport, gaseous emissions and solution export; 5) assessment of the quality of forest products and biomasses and of their environmental effects.

Session 2

SOIL AND PLANT SCIENCES IN HUMAN-IMPACTED AREAS

Humanity has been using land for a variety of purposes beside agriculture. The soils of urban and industrialized areas are frequently and sometimes greatly impacted by human activities and differ substantially from natural zonal counterparts in their physical, chemical and biological features, their performed functions, and supported services. The urban metabolism includes the rapid change of land use and causes soil removal, mixing and often sealing.
The remediation of contaminated sites implies strong modification of soil properties, often import of foreign soil materials and biomass matrices, and requires the adaptation of the soil-plant systems, e.g. in phyto- or bioremediation operations. The increasing attention towards community gardens, Nature Based Solutions for greener cities and, last but not least, the requirements of circular economy, all impinge on the use and transformation of urban and periurban land and a new paradigm for the soil-plant relationships.

The session will deal with the changes that anthropogenic activities impose on soil-plant systems within and around urban areas, in industrial settings and remediation operations, such as management and design of urban green infrastructure, waste management, water purification, reclamation and phyto-remediation of contaminated soils.

Session 3

SOIL AND PLANT SCIENCES IN SUSTAINABLE FOOD PRODUCTION AND CROPPING SYSTEMS

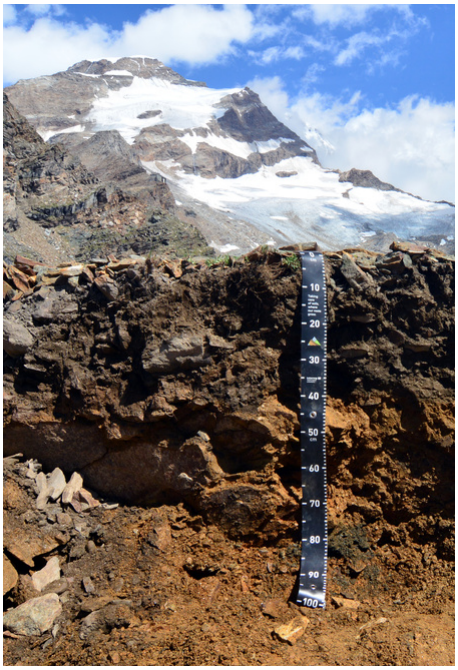
Today's agriculture is facing the intricate challenge of providing sufficient food for a rapidly growing world population in a changing environment, while sustainably managing the earth's limited resources that are under increasing pressure. It is abundantly clear that the world needs efficient and sustainable food/forage production systems that call for more efficient resource utilization, resilient cropping systems with lower environmental impact, as well as innovative solutions for increasing food security, quality and safety. These include initiatives that contribute to the definition of a circular agricultural economy as a viable model for minimizing the amount of external inputs for agricultural production, closing nutrient loops and reducing negative impacts on the environment by eliminating losses. Technological advances in agriculture can offer a multitude of opportunities, however their development will depend on a holistic understanding of agro-ecosystem functioning based on the fundamental knowledge of soil-plant-microbe processes.

This session will focus on 1) biotic and abiotic soil processes controlling element cycling in soils and their interactions; 2) the role of soil biodiversity in determining soil functions; 3) the response of plants to nutrient acquisition and stress factors, and 4) the application of novel technologies for promoting plant growth and stress tolerance, increasing soil fertility and enhancing nutrient/water use efficiency. Particular attention will also be devoted to the effects of agricultural practices on pedogenetic processes, the environmental sustainability of cropping systems, food quality and safety, and the provision of essential ecosystem services.

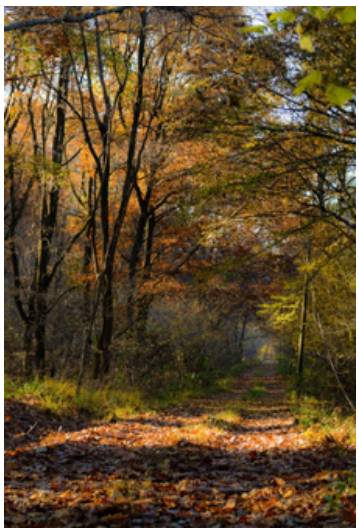
FOLLOWING WATER: FROM ALPINE GLACIERS TO RICE PADDIES

With the **virtual SPSS2021 field trip**, we aim at showing you a range of sites that could not be reached in normal field trips. We will travel more than 250 km and move from 3000 m to less than 100 m a.s.l. All sites have been the subject of various multidisciplinary studies over the last years carried out either by us or by expert colleagues from other fields of research. To better link the field trip to the topics of the scientific sessions, we divided it into four parts. By doing so we hope to keep you interested and stimulate the discussion.
The virtual field trip will follow the course of water and lead all participants through the exploration of some of the most interesting environments of North-Western Italy.

We will start from Alpine glacial lakes and ponds, high mountain vegetation and striking, hidden soils at the LTER site Istituto Mosso (**Monte Rosa Massif**). At an elevation ranging between about 2600 and 3300 m, the long seasonal snow cover and the cold air temperature shape the landscape, with the presence of periglacial landforms and snowbed ecosystems.



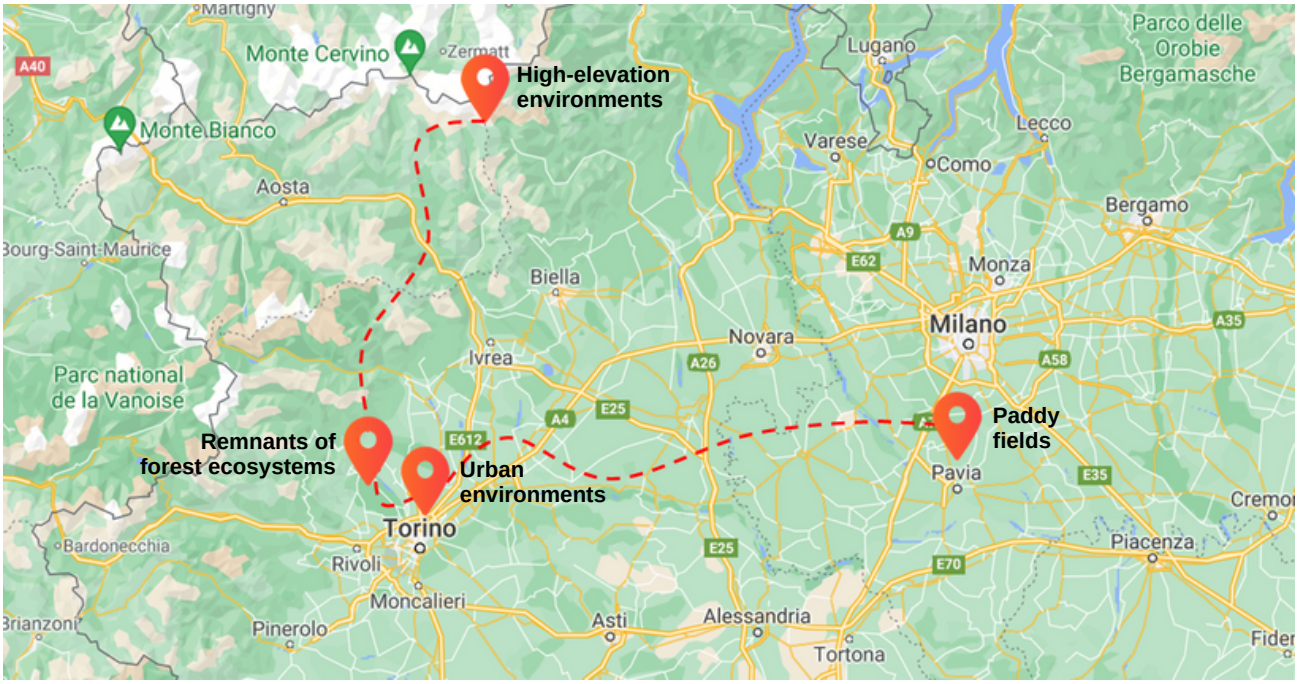
Then, following alpine rivers down to the **Stura di Lanzo floodplain** we will stop at one of few remaining forests that once covered the Po plain. We will show you soils that are more likely to be found in tropical areas than 100 km far from the Alps. However, after having escaped to changes in land use, these sites are now at risk because of the presence of non-indigenous tree species that through physiological adaptations sharply impact nutrient biogeochemical cycles.



Torino is just 10 km away, where the Stura di Lanzo merges with the Po river. Soil contamination is a problem here, as in many big cities that have been heavily industrialized. Industrial districts are now converted in urban parks where plant selection, decontamination techniques and architectural design meet to improve city life quality.

Still following the Po river, we will then leave Torino eastwards and look at how agriculture can shape the landscape. **Lowland rice fields** harbour a large biodiversity, and have been proposed to be listed among the UNESCO world heritage sites. Water management in rice paddies is the main driver of rice yield and quality, but also a key factor determining soil characteristics and processes. Sustainable agriculture in these areas is, however, now facing emerging challenges that require new approaches to combine crop production, resource management and environmental issues.

We will thus end the field trip in Lombardia, but don't worry: it's a virtual field trip, you do not have to come back to Torino by train...



Preliminary programme

Monday, September 20th, 9.00 - 16.25

Session 1

SOIL AND PLANT SCIENCES IN FOREST AND SEMI-NATURAL ECOSYSTEMS

9.00 - 9.15	Opening session
9.15 - 9.55	Keynote lecture
10.00 - 10.45	Oral presentations
11.00 - 13.00	Virtual excursion: *High-elevation environments*
14.00 - 15.00	Short communications & open forum
15.10 - 16.25	Oral presentations

Tuesday, September 21st, 9.00 - 16.30

9.00 - 11.00	Virtual excursion: *Remnants of forest ecosystems*
11.10 - 13.00	Time for meetings (boards, projects, ...)
14.00 - 15.50	SICA and SIPe plenary meetings
16.00 - 16.30	SICA and SIPe awards

Preliminary programme

Wednesday, September 22nd, 9.00 - 17.00

Session 2

SOIL AND PLANT SCIENCES IN HUMAN-IMPACTED AREAS

9.00 - 9.45	Keynote lecture
9.45 - 10.45	Oral presentations
11.00 - 12.00	Virtual excursion: *Urban environments*
12.10 - 13.10	Short communications & open forum
14.10 - 15.10	Oral presentations
15.20 - 17.00	SISS plenary meeting & award

Thursday, September 23rd, 9.00 - 16.30

Session 3

SOIL AND PLANT SCIENCES IN SUSTAINABLE FOOD PRODUCTION AND CROPPING SYSTEMS

9.00 - 9.45	Keynote lecture
9.45 - 10.45	Oral presentations
11.00 - 13.00	Virtual excursion: *Paddy fields*
14.00 - 15.00	Short communications & open forum
15.10 - 16.10	Oral presentations
16.15 - 16.30	Closing session

Info & contacts

Deadline for registration (registration fee of **70€** for regular members, **90€** for non regular members, **40€** for students) and abstract submission is **July 10 th.**

For any information you can write to: **spss2021@unito.it**

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