VII EUROSOIL 2025
& X Congreso Ibérico
de la Ciencia del Suelo

SEVILLE-SPAIN 8-12 SEP

Advancing soil knowledge for a sustainable future

Book of abstracts

Advancing Soil Knowledge for a Sustainable Future

Book of Abstracts
of the Communications
presented to the
VII EUROSOIL Meeting
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Editors:
José A. González Pérez and **José María de la Rosa Arranz**

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PRESENTATION OF THE VII EUROSOIL CONGRESS

Dear Distinguished Colleagues and Friends of Soil Science,

It is our great pleasure to welcome you to **EUROSOIL 2025**, hosted in the historic and vibrant city of Seville. This seventh edition of the European Confederation of Soil Science Societies Congress brings together a truly global community, with well over **1,000 contributions**—oral and poster presentations—from **45 countries**.

This remarkable response reflects the growing recognition that **soil lies at the very heart of sustainable development**. Soils sustain life, regulate climate, filter water, cycle nutrients, and support biodiversity and food production. Yet, they remain among the most endangered natural resources, threatened by degradation, pollution, sealing, and unsustainable exploitation. At this critical juncture—marked by the accelerating impacts of climate change, biodiversity loss, and global food insecurity—the role of soil science has never been more essential.

EUROSOIL 2025 offers a unique platform to address these challenges through rigorous scientific exchange, policy dialogue, and interdisciplinary collaboration. The program spans a broad spectrum of themes: from soil functions and ecosystem services to digital technologies, carbon sequestration, restoration, education, and innovation. Beyond the scientific sessions, the congress also celebrates Seville's social and cultural richness, creating opportunities to interact, share experiences, and build lasting connections in a warm and inspiring atmosphere. By connecting science, society, and practice, this congress embodies the ambition to t**ranslate knowledge into action for the benefit of people and the planet.**

We are deeply grateful for the outstanding efforts of all contributors—researchers, students (our future), practitioners, and institutions—who have shaped this year's rich and diverse agenda. We also extend our heartfelt thanks to keynote speakers, session chairs, volunteers, and our partnering companies and organizations for their invaluable support and commitment to advancing soil science.

May your participation in EUROSOIL 2025 be intellectually rewarding, professionally enriching, and personally inspiring. **Together, let us reaffirm our shared commitment to protecting and understanding soils as the foundation of a resilient and just future.**

Sincerely yours,

José A. González Pérez

José M. de la Rosa Arranz

Congress Co-Chairs

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ORGANIZING COMMITTEE

To ensure the successful planning, execution, and conclusion of the event, the EUROSOIL 2025 Organizing Committee (OC) is formed by members that belong to the main groups working in Soil Sciences from Andalusia and Spain and includes members from the Spanish and Portuguese Soil Sciences Society (SECS and SPCS) and senior and young scientists from Universities and research centers with expertise in different aspects of the Soil Sciences. They assisted with various aspects of the event including planning, promoting, communicating, securing funding and sponsorships and volunteering during the congress.

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SCIENTIFIC COMMITEE

The Scientific Committee (SC) members were proposed by the European Soil Sciences Societies affiliated to the ECSSS and by the Organizing Committee from renowned scientists, technicians, and policy managers with a demonstrated interest in the development of Soil Sciences in a broad sense.

To cover a wide range of topics in Soil Sciences, seventeen General Topics (GT) were identified intended to encompass most areas of interest. Specific SC members handled these topics. For the final Program, when submitting an abstract, the authors were asked to rank their top two GT preferences for consideration. Following the review process by the SC, and based on the themes received, some GTs were eliminated and additional sub-topics were introduced. In addition, the opening of sub-topics was also considered upon request by members of the SC, individual participants or groups.

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GT 09 - 630 - P

UNCOVERING SOIL DYNAMICS: BIOLOGICAL AND PHYSICOCHEMICAL RESPONSES TO SUSTAINABLE AND CONVENTIONAL PRACTICES IN AGROECOSYSTEM MANAGEMENT

GT 09. SOIL HEALTH / GT 02. SOIL PHYSICAL CHEMISTRY

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Among today's global challenges, soil degradation demands urgent and effective solutions. Investigating soil ecological dynamics and comparing farming practices can offer critical insights into soil health and support the design of resilient agroecosystems. This study evaluated the effects of different management practices on soil biological and physicochemical properties through a two-year field experiment featuring a wheat–chickpea rotation and pollinator-friendly plant mixes aligned with EU Common Agricultural Policy eco-schemes.

The experiment was conducted in Caselle in Pittari (Salerno, Italy), using three replicates across six treatments (Fig. 1): wheat (Triticum aestivum L. cv Ardito) under sustainable management with organic amendment (P1); chickpea (Cicer arietinum L.) in rotation with P1 (P2); wheat under conventional management with mineral fertilizer (NPK) (P3); O.P. RUSTICO mix (P4); O.P. ECO-5 PLUS mix (P5); and native spontaneous vegetation (P6). Soil samples were collected before sowing (control) and at flowering (F), and analyzed in the first year for bulk physicochemical parameters and enzymatic activities in rhizosphere (MRP) and rhizosheath (MRS) compartments, following protocols of the Italian Ministry of Agriculture.

Principal Component Analysis (PCA) accounted for 59% of the total data variance, with PC1 (37%) driven by biological activity and organic matter, and PC2 (22%) reflecting soil textural and chemical traits. Sustainable management (P1) aligned with vectors of biological indicators (β-GLU, DHA, URE, organic C), whereas conventional management (P3) samples appeared more dispersed and oriented toward mineralogical variables. Control samples distinctly differed from flowering samples. Notably, F-MRP-P3 and F-MRS-P3 clustered in a PCA region opposite to enzymatic activity and organic nutrient indicators, suggesting a mineral-dominated soil with reduced biological function under conventional practices. In contrast, F-MRP-P4 and F-MRS-P4 diverged from other treatments, influenced by clay content, cation exchange capacity (CEC), magnesium, and pH, indicating an improvement in mineral nutrition.

These PCA outcomes were corroborated by cluster analysis and chi-square testing, which demonstrated a statistically significant association between treatment type and cluster grouping ($p = 0.041$). Overall, these preliminary results underscore that sustainable farming practices measurably enhance soil quality by fostering both biological activity and chemical balance.

ACKNOWLEDGEMENTS

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Figure 1 - The experimental field.

GT 09 - 637 - P

EFFECT OF THE LAND USE CHANGE FROM FOREST TO AGRICULTURE IN THE SOIL HEALTH STATUS IN ZAGORA, PILIO, GREECE

GT 09. SOIL HEALTH / GT 09. SOIL HEALTH

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In the area of Zagora, in Mount Pilio, central Greece, forests have been cleared over past decades for the cultivation of apple trees. Currently there is a gradient of land use change, including the pristine environment (forest), abundoned apple orchards currently being deforested, and fully cultivated apple orchards. We tested the status of soil health in plots selected to represent these 3 steps of land use change (Fields A and B being two fully functional apple orchards at 270 m and 850 m of altitude, respectively, Field C a partially deforested abundoned orchard, and Field D pristine forest. Soil samples were obtained at two depths, 0-30 and 30-60 cm. We found that soil pH was acidic (from 5.02 to ca. 7) in all plots except for the surface layer of Field A (slightly alkaline). The particle size distribution did not change significantly across different land uses, ranging from loamy sand to clay loam. As for micronutrnet status, Cu was found rather elevated (up to 51 mg/kg) in the cultivated areas probably due to the continuous addition of phytoprotective materials, while Zn was rather low across all land uses. The marked difference was noted for organic C (OC), with forest having a 3-fold higher content than that of the cultivated fields, which had OC in the range of 1.5 to 2.5%, as expected for typical cultivated fields of Greece. We conclude that land use change had a marked effect on the soil health status of the studied areas across a gradient of land use change, with the most marked difference being soil C storage.

ACKNOWLEDGEMENTS

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