



# Editorial: Jaume Porta Casanellas - RENS Soil Science

Alberto Enrique<sup>1</sup>, Íñigo Virto<sup>1</sup>, Avelino Núñez Delgado<sup>2</sup>, Jorge Mataix-Solera<sup>3\*</sup> and Irene Ortiz-Bernad<sup>4</sup>

<sup>1</sup>Departamento de Ciencias, Universidad Pública de Navarra, Pamplona, Spain, <sup>2</sup>Departamento de Edafología y Química Agrícola, Universidade de Santiago de Compostela, Santiago de Compostela, Spain, <sup>3</sup>Departamento de Agroquímica y Medio Ambiente, Universidad Miguel Hernández de Elche, Elche, Alicante, Spain, <sup>4</sup>Departamento de Edafología y Química Agrícola, Universidad de Granada, Granada, Spain

**Keywords:** Jaume porta casanellas, RENS, SECS, soil science, tribute

## Editorial on the Special Issue

### Jaume Porta Casanellas - RENS Soil Science

This Special Issue is dedicated to the memory of the soil scientist Jaume Porta Casanellas, one of the most influential figures in Spanish soil science. He passed away shortly after the XXXII edition of one of the most emblematic congresses of the Spanish Society of Soil Science, the National Meeting of Soils (RENS2023), held in Navarre, Spain, which became his last scientific congress. Jaume Porta was a co-founder and Secretary of the Editorial Board of the Spanish Journal of Soil Science and also served as President of the Spanish Society of Soil Science, leaving a profound institutional and scientific legacy, strengthening deeply the connections between the Spanish and Latin American Soil Science Societies. As he passed away in September 2023, only a few days after his active participation in RENS2023, this Special Issue also includes a selection of contributions closely linked to that meeting and its scientific sessions, reflecting both his enduring influence and his final engagement with the soil science community. The selection of articles highlights the interdisciplinary nature of soil science.

Alcañiz et al. open this special issue with a contribution that gathers personal and professional reflections from disciples, colleagues and friends of Jaume Porta Casanellas, highlighting his scientific, educational and institutional legacy. The article reviews his leadership in Spanish soil science, his pioneering work on salt-affected and gypsum-rich soils, soil mapping, laboratory standardization, and soil education. Special emphasis is placed on his textbooks, international training initiatives, and his decisive role in strengthening scientific institutions, journals, and the dissemination of soil science knowledge.

Abbas et al. assess the effects of biochar (3%) combined with compost and animal manure (0.5%–1%) on soil carbon fractions, soil properties, and maize growth in low-fertility soil. Biochar combined with 1% compost significantly improved plant growth, soil organic matter, microbial biomass, and the carbon pool index. The findings highlight organic amendments as a sustainable strategy to restore degraded soils, enhance crop productivity, and support a circular economy under changing climate conditions.

Reyes-Sánchez examines soil science as an asset for interdisciplinary teaching approaches aimed at fostering values, scientific interest, and environmental responsibility in primary school children. Building on a previous methodological proposal, the study integrates knowledge construction with

## OPEN ACCESS

### Edited by:

Layla M. San-Emeterio,  
Swedish University of Agricultural  
Sciences, Sweden

### \*Correspondence

Jorge Mataix-Solera,  
✉ jorge.mataix@umh.es

**Received:** 28 January 2026

**Revised:** 03 March 2026

**Accepted:** 04 March 2026

**Published:** 11 March 2026

### Citation:

Enrique A, Virto Í, Delgado AN,  
Mataix-Solera J and Ortiz-Bernad I  
(2026) Editorial: Jaume Porta  
Casanellas - RENS Soil Science.  
*Span. J. Soil Sci.* 16:16319.  
doi: 10.3389/sjss.2026.16319

value formation through a playful, qualitative pedagogical strategy applied to 5th and 6th grade students. It compares children's perceptions of social, political, and environmental issues before and after the intervention, highlighting the role of science education in promoting sustainability-oriented attitudes.

Altés et al. analyse salt dynamics and drainage loads in a newly established irrigation district in the Ebro basin (NE Spain) during 2021–2023, including the severe 2023 drought. Monitoring two sub-basins showed that a 31% reduction in irrigation delivery led to a 73% decrease in drainage and a 70% reduction in salt exports. The results highlight the potential of irrigation restrictions to improve water and salt management, while also revealing associated yield losses.

Quintana-Esteras et al. evaluate the effects of prescribed burning and selective shrub clearing on subalpine soils and vegetation in the Central Pyrenees. Both treatments similarly increased soil pH and reduced several physical and chemical properties, while microbial functional diversity remained stable. Mechanical clearing enhanced soil microbial activity compared to burning. Two years after intervention, shrub cover remained low in both treatments, although prescribed burning resulted in more bare soil and reduced plant diversity than selective clearing.

Aguirre-Arcos et al. assess sap analysis as a rapid tool to diagnose the nutritional status of olive trees under integrated production in southern Spain. Trials across five farms showed clear seasonal nutrient fluxes in sap, influenced by climate and phenology. Comparisons among sap, leaf, and soil analyses highlighted potassium dominance in sap and climate-driven micronutrient variability. The results indicate that sap analysis complements traditional methods, supporting more precise and balanced fertilization strategies in olive orchards.

Usón Murillo et al. analyse initiatives to harmonize soil analytical methods in Spain through interlaboratory proficiency tests promoted by the Spanish Society of Soil Science (SECS) and partner institutions. Results from tests in 2019 and 2021 revealed significant methodological differences among laboratories, with partial improvements in performance and persistent weaknesses, particularly in organic matter and texture analyses. The study highlights the need for regular proficiency testing to improve analytical quality and ensure reliable soil data for sustainable soil management and policy implementation.

Pérez Moreira and Barral Silva in their article explore the rare but significant representation of soil in Western landscape painting. It identifies periods of naturalistic art, particularly in 17th-century Dutch painting and 19th-century European landscape schools, when artists depicted soils with unusual detail. Some works reveal recognizable soil horizons and features that can be interpreted using modern soil science. The study contextualizes these artistic representations historically and culturally, highlighting intersections between art, observation of nature, and soil knowledge.

Barreiro et al. study evaluates the influence of tree species on soil properties and microbial activity in 54 forest plantations in Galicia, NW Spain. Soils were generally acidic with high organic matter and low phosphorus

contents. Moisture varied by vegetation: the driest soils under eucalyptus and birch, and the wettest under shrublands. Microbial respiration was highest in walnut soils and lowest in eucalyptus, while  $\beta$ -glucosidase activity remained unchanged. Results highlight that forest management, particularly tree species selection, affects soil microbial function and carbon stabilization, with implications for climate-adaptive forestry planning.

The special issue concludes with the study of Tierra et al. who investigate soil salinity in the rainfed landscapes of the “Saladas of Sástago-Bujaraloz” in the Central Ebro Basin, Spain. Analyses of 319 soil samples and electromagnetic sensor readings revealed highly variable and often extreme salinity, with 73% of samples very strongly saline. Vertical and horizontal variability was observed, with best electro-magnetic sensor readings correlations at 0–100 cm depth. The authors propose incorporating soil salinity as an agronomic criterion within the EU Common Agricultural Policy, recommending the exclusion of plots with  $EC_e > 10$  dS m<sup>-1</sup>, representing more than half of their study area.

## AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

## FUNDING

The author(s) declared that financial support was not received for this work and/or its publication.

## CONFLICT OF INTEREST

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## GENERATIVE AI STATEMENT

The author(s) declared that generative AI was not used in the creation of this manuscript.

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