

POSTDOCTORAL POSITION OFFER FORM

1. Job Position title: Postdoctoral Research in **Enhancing the sustainability of agroecosystems: phosphorus and nitrogen use efficiency in soils.**
2. Keywords: soil reactive surfaces, soil fertility, soil erosion and conservation, critical nutrients, phosphorus, nitrogen, soil functions
3. Researcher in charge in DAUCO:
 - Title: Full Professor
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 - Research group: Soil Science Unit, AGR-165
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4. Research Group description (max. 2.000 characters)

The Soil Science Unit of the University of Córdoba (<https://scholar.google.com/citations?hl=es&user=PruPcEAAAAAJ>) is composed by V. Barrón, M.C. del Campillo, A. R. Sánchez-Rodríguez, M. Fuentes and E.V. Taguas. They lead the study of soil mineralogy and reactive soil surfaces, especially carbonates, Fe oxides and clay minerals and their influence on nutrient (P, N, Fe, Zn) dynamics in soil. They also have experience in the production of synthetic minerals and slow release fertilizers (several patents) such as vivianite $[(Fe^{2+})_3(PO_4)_2 \cdot 8H_2O]$ and siderite $[(FeCO_3)]$. Furthermore, they research on the use of innovative fertiliser products based on circular economy, greenhouse gas emissions and NOx gases in agricultural systems, soil quality and in P bioavailability in calcareous soils including its interactions with other nutrients (Fe and Zn). On the other hand, they have worked on soil erosion measurements at the different scales, modelisation with hydrological tools such as AnnAGNPS (in collaboration with the USDA) and evaluation of innovative soil conservation measures in olive groves. The main aim of the Soil Science Unit is to improve the sustainability of agriculture and to reduce its impact on the environment. This research group has published >275 manuscripts in journals included in the JCR, has been cited > 17500, has a *h*-index of 70, from Google scholar, or *h*=56 from Science Citation Index (Figure 1).

Con formato: Inglés (americano)

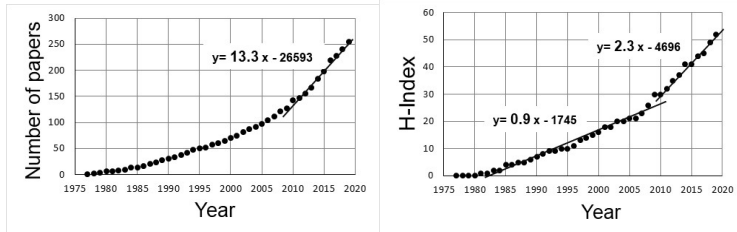


Figure 1. Evolution of JCR papers and impact, according to Science Citation Index for AGR165- Soil Science.

They collaborate with > 170 international researchers from 25 countries and with relevant companies such as Fertiberia and Fertinagro (fertilizer companies) and farmers associations (COVAP, Dehesa de Campo Alto, ELAIA-Sovena, SAT-Córdoba).

Research lines:

- 1.-Management of critical nutrients (P, N) in edaphic environments.
 - 2.-Strategies based on circular economy to enhance N and P bioavailability and soil functions in calcareous soils.
 - 3.-Interactions between critical nutrients in agriculture (P-Fe, P-Zn, N-S).
 - 4.-Abiotic photocatalytic reactions of N gases in agricultural soils. Solar fertilizers.
 - 5.-Entomopathogenic fungi as plant growth promoters and nutrient enhancers (in collaboration with the Agricultural Entomology Unit).
 - 6- Measurements, characterization and modelling of soil erosion and degradation processes in olive groves.
 - 7- Design and analysis of innovative soil conservation measures based on the topography modification and the use of pruning residues in olive groves.
5. Job position description (max. 2.000 characters)

The work will be connected with different funded projects in which the members of the Soil Science Unit participate: 1.- Abiotic reactions in agricultural soils: an unexplored input in agricultural soils (AbioNSoil; PAIDI-Junta de Andalucía.); 2.- “Soil phosphorus fertility and functionality as affected by the application of allochthonous phosphorous sources” (Ministry of Science and Innovation); 3.- “Optimising Bio-based Fertilisers in Agriculture – Knowledgebase for New Policies” (EU H2020).

The main objectives will be



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- (i) to develop sustainable strategies to reduce the use of synthetic P fertilisers in agriculture and to enhance soil health through the use of biobased fertilizers.
- (ii) to study abiotic N reactions in agricultural soils, especially those involving nitric oxide (NO).

Job description:

To manage and develop lab, pot and field experiments in collaboration with other project partners

Write scientific articles

Disseminate research (workshops, conferences)

Brief stays in other research groups

Work for the department (supervising students, occasional teaching)

Formal requirements:

Hold a PhD in agronomy, environmental sciences, biology, chemistry or related disciplines.

Good understanding about phosphorus and nitrogen dynamics in soil

Good understanding about microbial communities in soil

Technical skills and interest in conducting laboratory, greenhouse and field experiments

Have experience with chemical characterization of soils and plants.

Have experience with data management and an interest in statistics.

Have good communicative and interpersonal skills.

Have excellent English writing and speaking abilities.