

## **ESR 8: The effectiveness of vivianite as a sustainable iron and phosphate fertilizer for agricultural crops**

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Employer: University of Sevilla, Spain

### **Project description:**

This project is part of the European H2020 Marie Skłodowska-Curie Innovative Training Network P-TRAP (Preventing Phosphorus Input to Surface Waters – New Concepts in Trapping, Recycling and Management). P-TRAP tackles two urgent interlinked global problems: Potential shortages of phosphate for producing agricultural fertilizers and the decline of surface water quality upon excess phosphate input. P-TRAP targets the P flux from artificially drained agricultural areas and the internal P load of lakes. By this, P-TRAP aims at intercepting the undesired flux of phosphate from agricultural systems into surface waters and developing a phosphate recycling strategy.

The project of ESR 8 is dedicated to study of the efficiency as P and Fe fertilizer of vivianite. This poorly soluble compound is obtained from the precipitation of P from waters, and it may be potentially useful as P and Fe source. The research will quantify the effect of application of vivianite to calcareous agricultural fields in comparison to conventional P fertilizers with regard to bioavailability, yield and crop quality (with ESR2, and 10). Also, it will establish the dosage of these Fe-P minerals required for obtaining similar P and Fe bioavailability and plant nutritional status as with conventional fertilizer (in this task, the company FERTIBERIA S.A will be involved). Establish the efficiency of vivianite as slow-release fertilizers by observing the annual time course of Fe and P bioavailability after fertilizer application in the field (with ESR7).

### **Qualifications:**

We seek an enthusiastic PhD student holding an MSc degree (at the start of the contract) that ensures appropriate background knowledge in agronomy, soil science, and with a strong passion for the study of soil fertility. You have a solid knowledge on biogeochemical cycle of nutrients in soil. Experience in the performance of experiments with plants under controlled conditions and in the field, in particular fertilizer experiments, and some lab skills (e.g. determination of nutrients in soils and plants) is helpful but not required.

You approach scientific problems with determination and eager to develop multidisciplinary skills. You must be willing to travel abroad for secondments and measurement campaigns, and to present your research to an international research community. As this project requires close collaboration within the consortium, candidates are expected to be excellent team players. You also have excellent written and spoken English skills.

According to [EU eligibility criteria](#), researchers may be of any nationality, BUT must be at their early carrier stage and may not have resided or carried out their main activity (work, studies, etc.) in Spain for more than 12 months in the 3 years immediately before the application deadline.

### **Terms of employment:**

You will be offered a full-time position at first for one year, conditions are based on the Collective Labour Agreement of the University of Sevilla. With good performance this will be extended to a total period of three years, with the specific intent that it results in a doctorate within this period. The gross monthly salary is €2,304 with a full-time appointment. It is possible an additional assistance in case of family charge till 250 € per month.

Facilities for sports and child care are available on one of the campus of the University of Sevilla. You will also profit from the training activities within P-TRAP which includes summer schools and other project-wide and local activities.

### **About the organisation:**

The University of Sevilla is one of the largest universities in Spain with more than 60000 students and 7000 staff. The ESR will perform the activities in the School of Agricultural Engineering, with more than 1000 students (BSc and MSc) and 200 staff, ascribed to 9 Departments. This is an active school, with a young teaching staff, and with many contacts and agreements with many different companies, including Fertiberia, a partner in this project.

The Department of Agroforestry Sciences conducts teaching in crop and animal sciences and production, including agronomy. The department is involved in the PhD program "Agricultural Engineering" jointly the University of Cordoba, the National Research Council (CSIC), and the Andalusian Institute of Agricultural and Fisheries Research (IFAPA). In this program more than 250 professors and 100 PhD students participate.

You will be working within the "soil fertility group", part of the agronomy research group, which focuses on soil fertility management. We study by means of lab and field experiments nutrient dynamics and availability in soil, with particular emphasis in phosphorus and iron, new fertilizer products, and interaction of organic matter and microbial activity with nutrients in soils and how this interaction affects its availability to plants.

### **How to apply:**

Please upload your application material before **April 15<sup>th</sup>, 2019**. The intended start will be September 1st of 2019

The application material should include a letter of motivation, a curriculum vitae, copies of university and high-school degrees (including grades) and either two letters of recommendation or contact information of two people that can be contacted for reference. The selection procedure will follow the [Code of Conduct for Recruitment](#). Candidates will be selected first on [EU eligibility criteria](#), second on qualifications. The candidate will be selected based on a job-interview with the direct supervisors. For more information on the P-TRAP project, including this and other vacancies, please visit the [P-TRAP website](#).

### **Contact**

Additional information about the vacancy can be obtained from Prof. Antonio Delgado via [adelgado@us.es](mailto:adelgado@us.es)