Isabel Ortega-Bedoya

PhD Student at UNAV

Isabel is from Medellín, Colombia. BSc in Biological Engineer and M.Sc in Environment & Development at the National University of Colombia-UNAL.

'In my MS thesis, I worked with the residues from the wastewater treatment plant in Medellín to determine their suitability for use as soil amendments and for the potential production of fertilizers. Therefore, as soon as I read the research proposal from the BACh group within WIT, I immediately knew it was my choice to continue my resercher career.'

Isabel has joined the research group of Biological and Agricultural Chemistry (BACh) of the University of Navarra, led by Dr. José María García-Mina.

Research

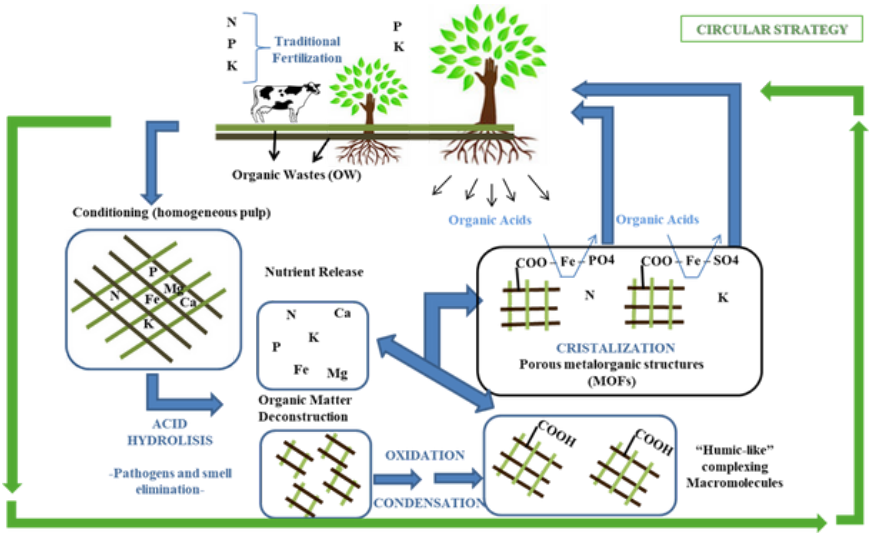
Sustainable Production of Granulated Fertilizers from Organic Waste: An Innovative Approach for Nutrient Management in Agriculture.

Research objective: To produce a functional fertilizer that addresses two current environmental problems: the management of solid organic waste and NPK runoff pollution from traditional crop fertilization. The focus is on formulating an efficient fertilizer from municipal organic waste to prevent future contamination and achieve zero-carbon fertilizer production for plant growth.

Abstract:

We aim to achieve the objetive of this project by extracting the necessary nutrients for plants from organic waste in the Pamplona area. Subsequently, we will encapsulate them within a chemical network known as a Metal Organic Framework (MOF) and assess the ease with which plants can absorb what they need from this nutrient mesh through natural oxidation-reduction reactions in the roots.

This project introduces an innovative approach that exploits the chemical transformation of organic precursors, such as lignin, cellulose, proteins, or sugars, to obtain chelating macromolecules. These macromolecules form an organometallic matrix capable of controlled nutrient release, thereby addressing the challenges of sustainable agriculture and waste management. This study will contribute to advancements in nutrient management by offering an innovative solution to enhance the efficiency and sustainability of agricultural practices.



'For as long as I can remember, I have envisioned myself as a researcher. Over the years, climate change and the environmental crisis of our planet have become some of my biggest concerns. While pursuing my MS degree, I discovered my passion for teaching, and then I realized that change can also be achieved by raising awareness in others. So, my dream evolved, and now I aspire to be both a teacher and a researcher, fulfilling my life's purpose.'