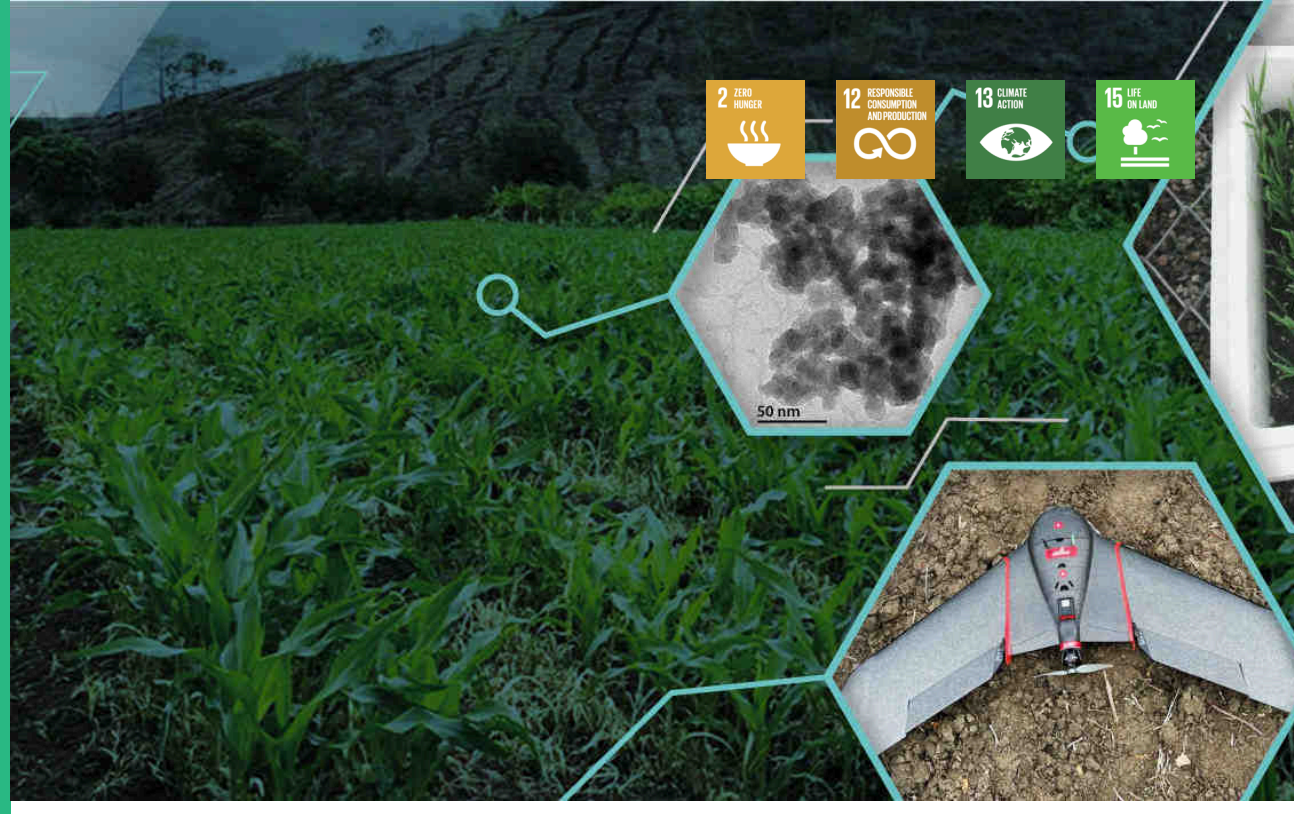
UNIVERSIDAD INDUSTRIAL DE SANTANDER, COLOMBIA

Nanofertilizers: An innovative solution to boost production and reduce environmental impact

Nanofertilizers improve fertilization efficiency and help mitigate the effects of climate change



16
Presentations and publications

15
research work

1
Proposal for the creation of the Spin-Off.

529
Trained producers

23
Trained students

10
technical support

3
Photogrammetric flights

12
Dissemination Activities

Initiative

Assess the effect of applying blends of fertilizers and nanofertilizers (zeolite, titanium dioxide, and zinc oxide) on the intensive production of crops. For this, a process of nanostructuring and characterization of TiO2, ZnO and zeolite nanofertilizers is being developed, through the high-energy mechanical grinding technique, using a planetary mill. The nanostructured material is implemented in experimental plots on corn producers' properties. The tests allow phytotoxicity tests to be carried out, evaluate the effects on productivity and estimate the impacts generated on the soil's physical, chemical, and biological characteristics.

Using balanced fertilizers and nanofertilizers in crops increases biomass production and nitrogen absorption.

Tech solution

- Manufacture of TiO2, ZnO and zeolite nanofertilizers in a high-energy mill by varying the time, speed and filling factor of the mill.
- Establishment of ryegrass crops.
- Balanced fertilizer formulations with adequate properties to improve fertilization efficiency.
- Evaluation of the effect of adding fertilizers combined with nanofertilizers on crops.
- Financial viability analysis of a Spin-Off.
- Technical support, training and socialization of the implemented technologies.

Project Impact

MORE INFO

Impacts and Results

- Manufacture of TiO2, ZnO and zeolite nanofertilizers, and analysis in crops of Avena sativa, Tithonia diversifolia, Cenchrus clandestinus, Lolium perenne, Medicago sativa, Zea mays under greenhouse conditions.
- Data on particle sizes of nanofertilizers synthesized under different grinding parameters.
- Evaluation of nutrient absorption and nitrogen use efficiency for different crops.
- Use of TiO2 nanofertilizer and balanced fertilization in Lolium perenne crops under greenhouse conditions. It was observed: an improvement in biomass production on a dry basis by 25% and in nitrogen recovery efficiency by 24%.
- Establishment of experimental plots with corn crops in Ecuador and Colombia.

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