

# The reduction of greenhouse gases and the increase in productivity as a driving force to achieve sustainable agriculture.

The objective is to increase the productivity of regional crops of importance in South America and Spain, while simultaneously reducing emissions of oxide through the generation of climate-smart inoculants.



The use of microorganisms for crop inoculation has historically improved the profitability of agricultural producers, and currently, genetic improvement is added to minimize environmental impact.

## The implemented initiative

In this project, we have found a way to genetically improve inoculants without using genetically modified microbes. The objectives pursued are obtaining spontaneous mutations and new microbial isolates that improve productivity, nutritional quality, and environmental quality of some of the main crops inoculated in the region. The main beneficiaries are

producers, who can obtain higher profitability in their fields without drastically affecting the environment. In addition, the technologies developed can be utilized by various companies that commercialize bio-inoculants, and can also serve as a subject of study for other researchers, technicians, and students.

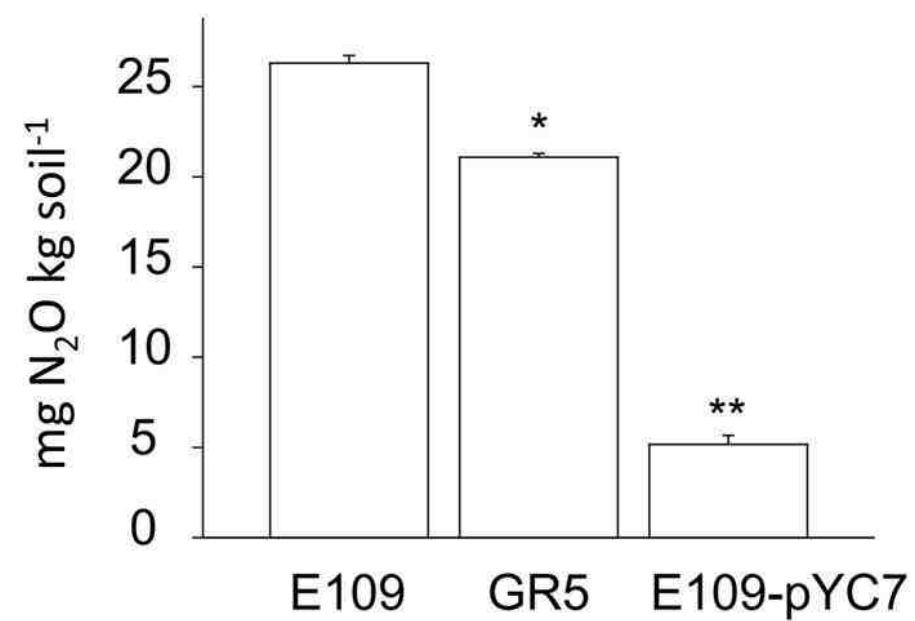
The generation of greenhouse gases by agriculture accelerates climate change, increasing temperatures and decreasing precipitation, which in turn has an effect on agriculture itself.

## The technological solution

The sequencing and genomic analysis of the 18 main inoculants used in Latin America and the Caribbean demonstrated that most of these bio-inputs can be potential nitrous oxide emitters. However, genetic variability was obtained for some of the responsible clusters in certain microorganisms, which led to the identification of 7 inoculants that reduce nitrous oxide emissions in crops. Additionally, it was confirmed that

these strategies do not have a negative economic impact; in fact, some of these microbes also improve the nitrogen content in soybean plants. On the other hand, crop productivity was improved through various mechanisms in the microorganisms, including greater herbicide tolerance, nutrient availability and pathogen tolerance.

Reduction in nitrous oxide generation by one of the genetically varied inoculants studied (GR5).



**-35%**

Reduction of greenhouse gas emissions.



**+6**

6 countries joining forces to generate a more environmentally friendly agriculture.

MÁS INFO



## Results

The project aims to increase the productivity of various regional crops while reducing nitrous oxide emissions

by over 35% through the generation of climate-smart inoculants.

Main donors

Participating Organizations

