

# The potential of autochthonous bacteria for use as biofertilizers

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Neiker-Tecnalia, the Basque Institute for Agricultural Research and Development, is working to select autochthonous bacteria with a biofertilizing potential as a result of the stimulating effect they have on the take-up of nutrients by plants, phytohormone production and

phytopathogen control. The research is of great interest for farmers because bacteria-based biofertilizers constitute an alternative to conventional chemical fertilizers that are expensive and less sustainable from the environmental point of view.

The final goal in selecting autochthonous bacteria with a biofertilizing potential is to create a bacterial strain bank to be subsequently used in biofertilizing formulations. These bacteria have the capacity to increase the bioavailability of nutrients present in the soil so that the crops can thus assimilate them; what is more, they produce hormones that stimulate plant growth and encourage root development. Another of their advantages is that they even combat other micro-organisms in the soil that cause plant diseases.

## **Alternative to the adding of conventional fertilizers and pesticides**

The aim of biofertilizers is to complement and, where appropriate, replace conventional [chemical fertilizers](#) so that their use can be reduced with the resulting economic and environmental benefits. In this respect, the bacteria used in biofertilizer formulations encourage plants to absorb, on their own, a greater quantity of nutrients which, even if they are naturally present in the soil, on occasions cannot be assimilated by plants because they are in an insoluble form. Conventional chemical fertilizers, however, supply the soil with chemical elements which, despite functioning as a fertilizer, can end up contaminating aquifers if they are not applied in the right dose and at the right moment.



By contrast, the bacteria containing biofertilizing formulations compete with other micro-organisms in the soil and can hamper the appearance of crop pests, thus minimizing the use of pesticides.

Neiker-Tecnalia researchers isolated autochthonous bacterial strains belonging to [soil](#) samples and plant tissue. They then selected the best candidates by means of in vitro analysis and right now they are running tests on lettuce crops (chosen for their rapid growth) in growth chambers under controlled conditions. One of the aims of this experiment is to test the capability of the [bacteria](#) with a biofertilizing potential and biofertilizers produced in an artisanal way by local farmers compared with commercial biofertilizers and conventional chemical fertilizers to increase productivity in poor soils and, specifically, to combat the

impact of the *Sclerotinia sclerotiorum* pathogen which affects roots. In the experiment the effectiveness of other [organic fertilizers](#) like the bokashi type compost of Japanese origin will also be tested. The final step will be to test the effectiveness of the biofertilizers under actual field conditions.

The Neiker-Tecnalia research is opening up a channel of great interest to cut the use of chemically-synthesised fertilizers and pesticides that entail environmental hazards and constitute a significant economic cost for farmers.

Provided by Elhuyar Fundazioa

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