



Transition paths to sustainable legume-based systems in Europe

## Transition to legume biofertilizers for sustainable agriculture

### Problem

Conventional agriculture has played a significant role in increasing plant productivity to meet the food demands of a growing human population. However, this intensive farming has also led to an increasing dependence on chemical fertilizers, pesticides, herbicides, fungicides, and insecticides, which are expensive and harmful to human health and the environment. Considering the adverse effects of agrichemicals and the problems raised in the agriculture sector by climate change, modern agriculture needs to adopt eco-friendly approaches for food safety and sustainable crop production.

### Practical recommendations

One approach in organic farming is the use of microbial inoculants or biofertilizers. Biofertilizers are formulations containing living microorganisms which, when applied to seed, plant surfaces, or soil, colonize the interior of the plant and promote growth by increasing the availability of nutrients to the host plant or improving water uptake or acting as biocontrol agents. For field application, biofertilizers are applied either directly to the seeds (mixing seeds with carriers or stickers) or indirectly to the soil (as liquid or granular formulations). They are easy-to-use, environmentally friendly, renewable source of plant nutrients, cost-effective relative to chemical fertilizers and can increase crop yields by 20–30%.

### Author(s)

Evdoxia Efstathiadou<sup>1</sup>, Georgia Ntatsi<sup>2</sup>, Dimitrios Savvas<sup>2</sup>, Anastasia P. Tampakaki<sup>1</sup>

<sup>1</sup>Laboratory of General and Agricultural Microbiology

<sup>2</sup>Laboratory of Vegetable Crops  
Agricultural University of Athens, Iera Odos 75, 11855 Athens, Greece

### Contact

Georgia Ntatsi, ntatsi@aua.gr

### Country/Region

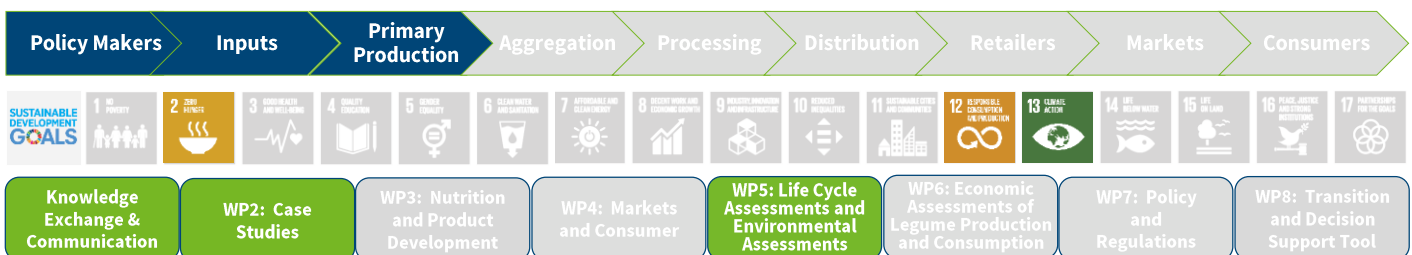
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### Keywords

Biofertilizers, inoculants, rhizobia, legumes



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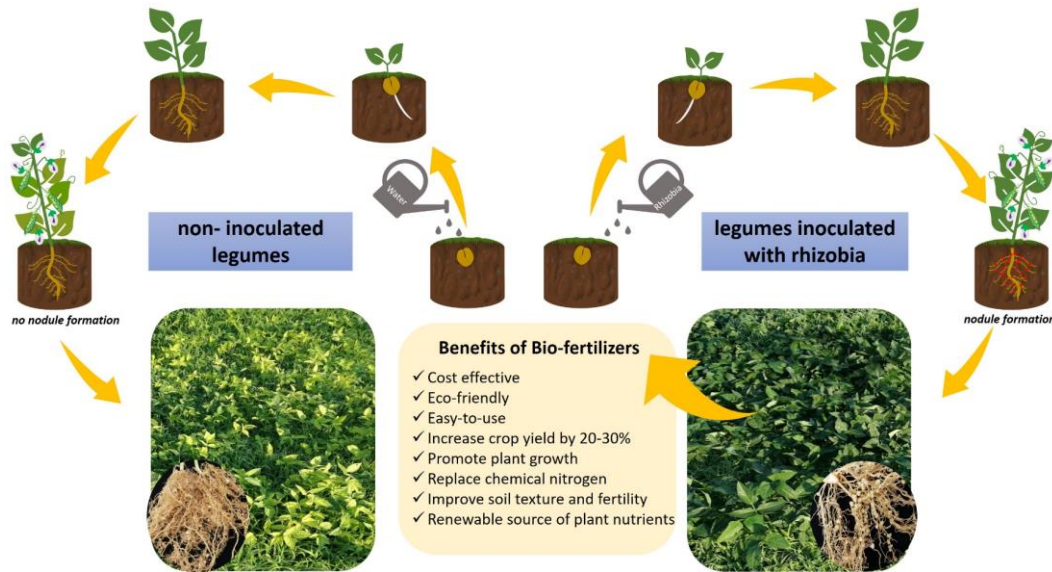




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Overall, the biofertilizers' benefits for farmers, the environment and bio-economy have led to the development of a new global market focused on the optimization of biofertilizers' effectiveness and the development of "tailor-made" inoculants addressing farmers' needs. This initiative is supported by many countries in Europe as evidenced by the increase number of existing government policies.



**Figure 1.** Effect of rhizobia-based biofertilizers on plant growth and performance.

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### About TRUE

The EU funded project "TTransition paths to sUustainable legume based systems in Europe" (TRUE) is a balanced practice-research partnership of 24 institutions, which aims to identify the best routes, or "transition paths" to **increase sustainable legume cultivation and consumption across Europe** and includes the entire legume feed and food value chains.

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