EBIC
European Biostimulants Industry Council

Biostimulants: Opportunities and challenges to increase soil fertility

Antonis Angeletakis

SOILS: WHERE FOOD BEGINS

Global Symposium on Soils for Nutrition | 26-29 July 2022

GLOBAL SOIL PARTNERSHIP

EBIC's mission is **to ensure biostimulant technologies are valued as integral to sustainable agriculture, while securing an enabling regulatory framework for all of them**

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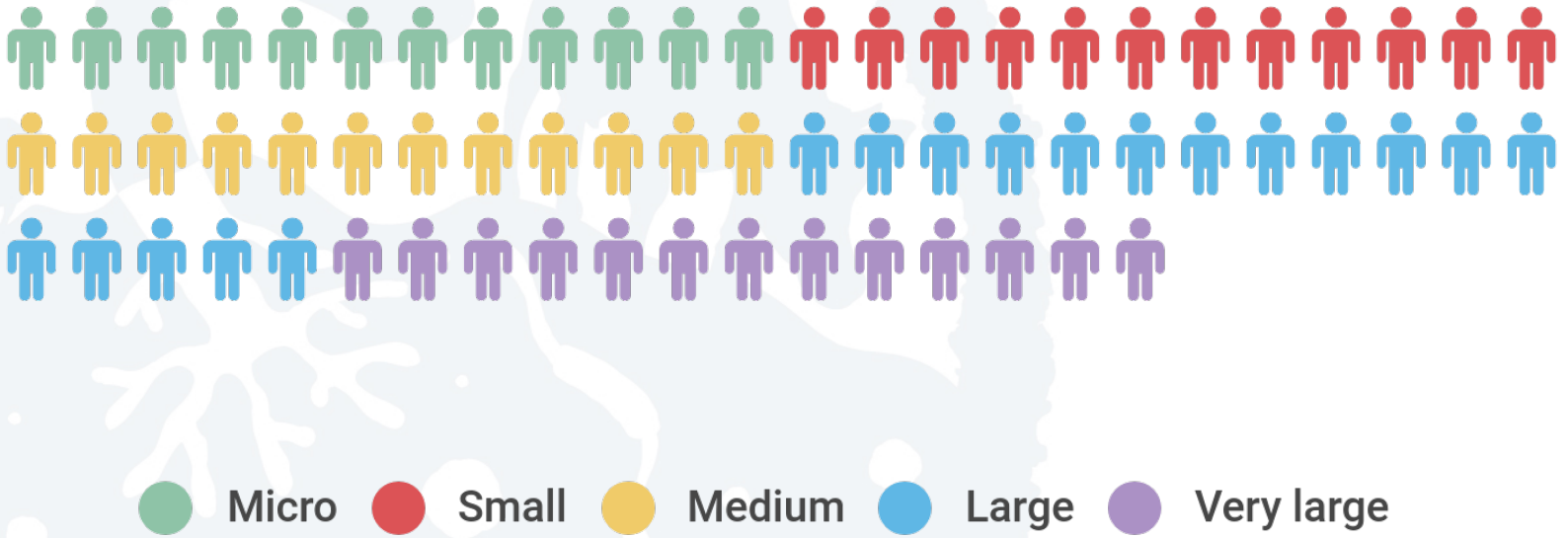
66 member companies

Breakdown by size (based on global turnover and headcount)

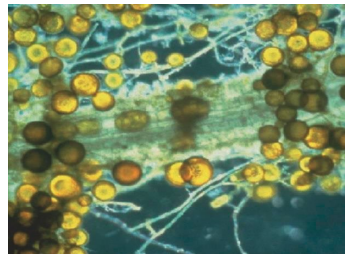


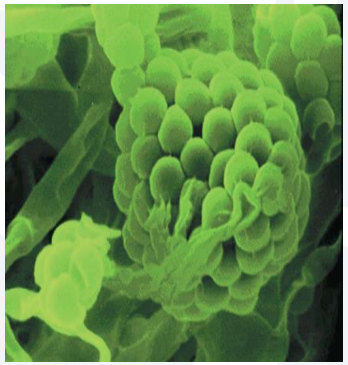
As of June 1st, 2022

Biostimulants act on natural processes in plants and the area around the roots to **enhance**:

1. nutrient uptake, nutrient efficiency
2. tolerance to abiotic stress
3. crop quality

With benefits for yield and vigor





Component materials include seaweed and plant extracts, humic and fulvic acids, hydrolysed proteins and micro-organisms, among others

We are all aware of the need to optimise nutrient use while maintaining or improving soil quality

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SOIL FERTILITY

Soil fertility is made up of **three core aspects**:
physical structure, chemical composition and biological diversity.
All of these aspects are essential for healthy and
fertile agricultural soils.

BIOLOGICAL DIVERSITY

The biological diversity of the soil can enhance soil structure and improve the availability of nutrients for plants. A fertile soil is one that has good structure, plenty of organic matter to foster biodiversity, and a balanced pH level.

CHEMICAL COMPOSITION

The acidity of the soil (pH) directly affects whether nutrients can be extracted and absorbed by plants, and can adversely affect the soil's biological diversity – which, in turn, can impact nutrient availability and soil structure.

PHYSICAL STRUCTURE

This is strongly influenced by the presence of organic matter in soil, as well as its biodiversity. Roots, insects, worms and other creatures loosen and mix the soil, improving its structure and fertility.

Soil biodiversity

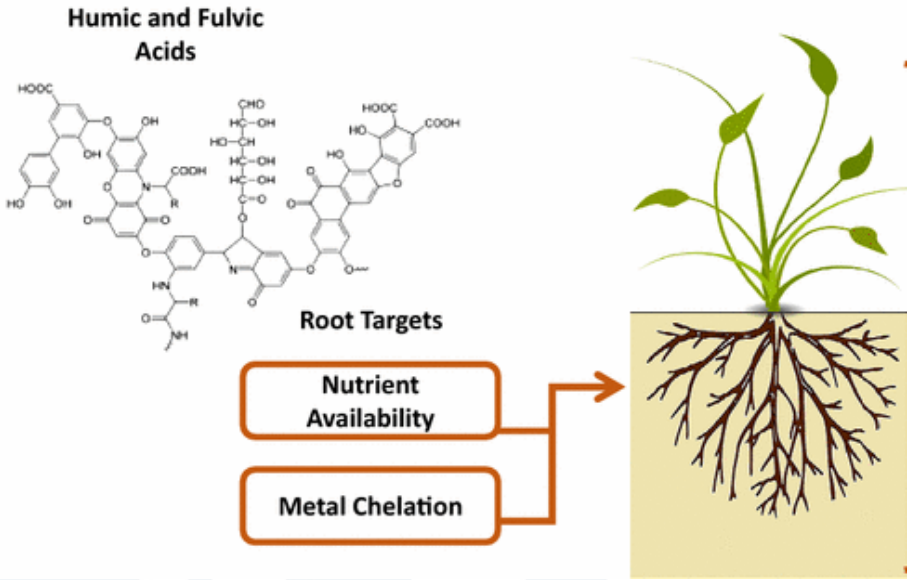
Microbial plant biostimulants help reinforce and replenish communities of beneficial microorganisms that fix nitrogen, solubilize minerals, and/or encourage plant exudates involved in nutrient exchanges, among other benefits.

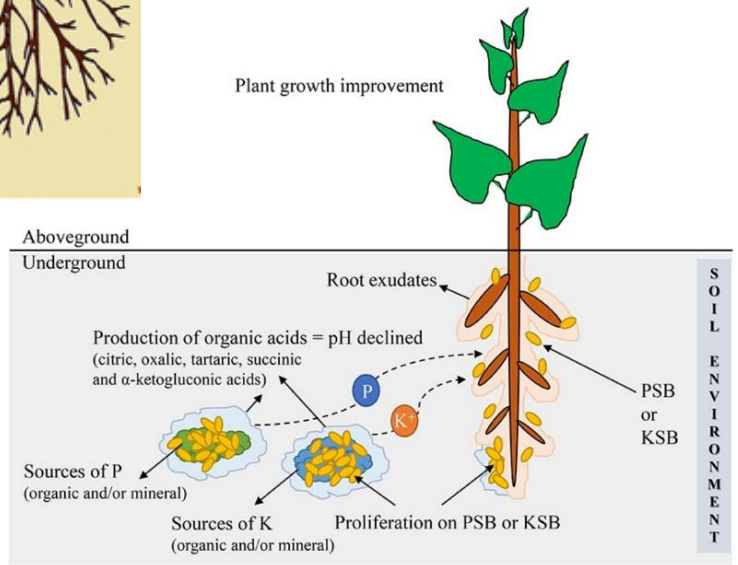
Source: ICL

Microorganisms cooperate or compete with the crop for nutrients. Increasing soil quality as a habitat for cooperative microorganisms increases productivity.

Chemical composition

Some plant biostimulants (e.g. those containing humic and fulvic acids and some microorganisms) can positively influence the chemical composition of soils around plants' roots, including soil pH.





Images: Esmaeil Bakhshandeh; Hemmatollah Pirdashti; Khadijeh Shahsavarpour Lendeh. Ecological Engineering, Vol: 103 (2017): pp 164-169. DOI: 10.1016/j.ecoleng.2017.03.008 and adapted from Van Oosten, M.J., Pepe, O., De Pascale, S. et al. Chem. Biol. Technol. Agric. (2017) 4: 5. DOI:10.1186/s40538-017-0089-5

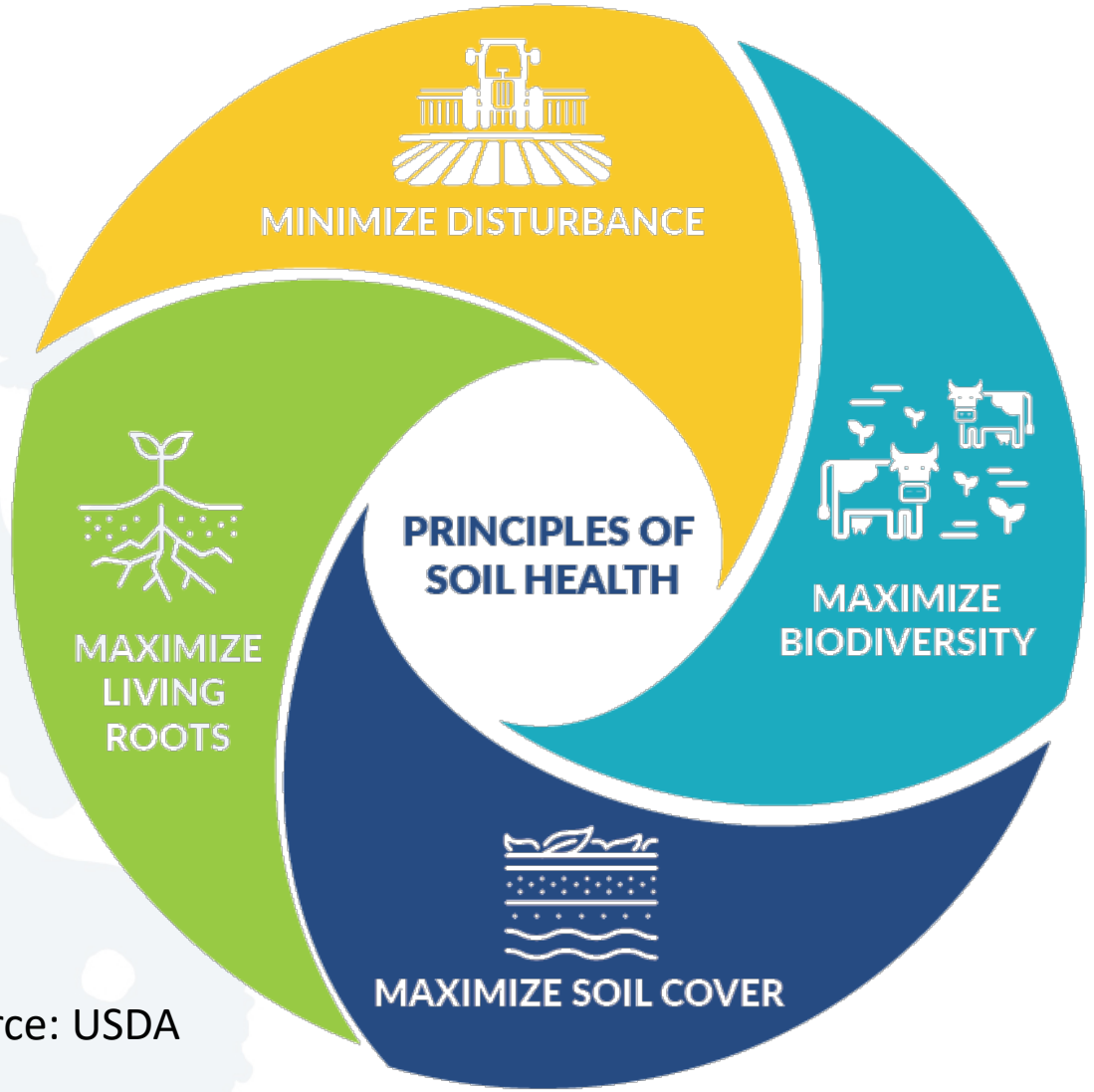
Physical structure

Plant biostimulants that foster root development improve soil structure and carbon content if the roots are left in the soil at harvest.

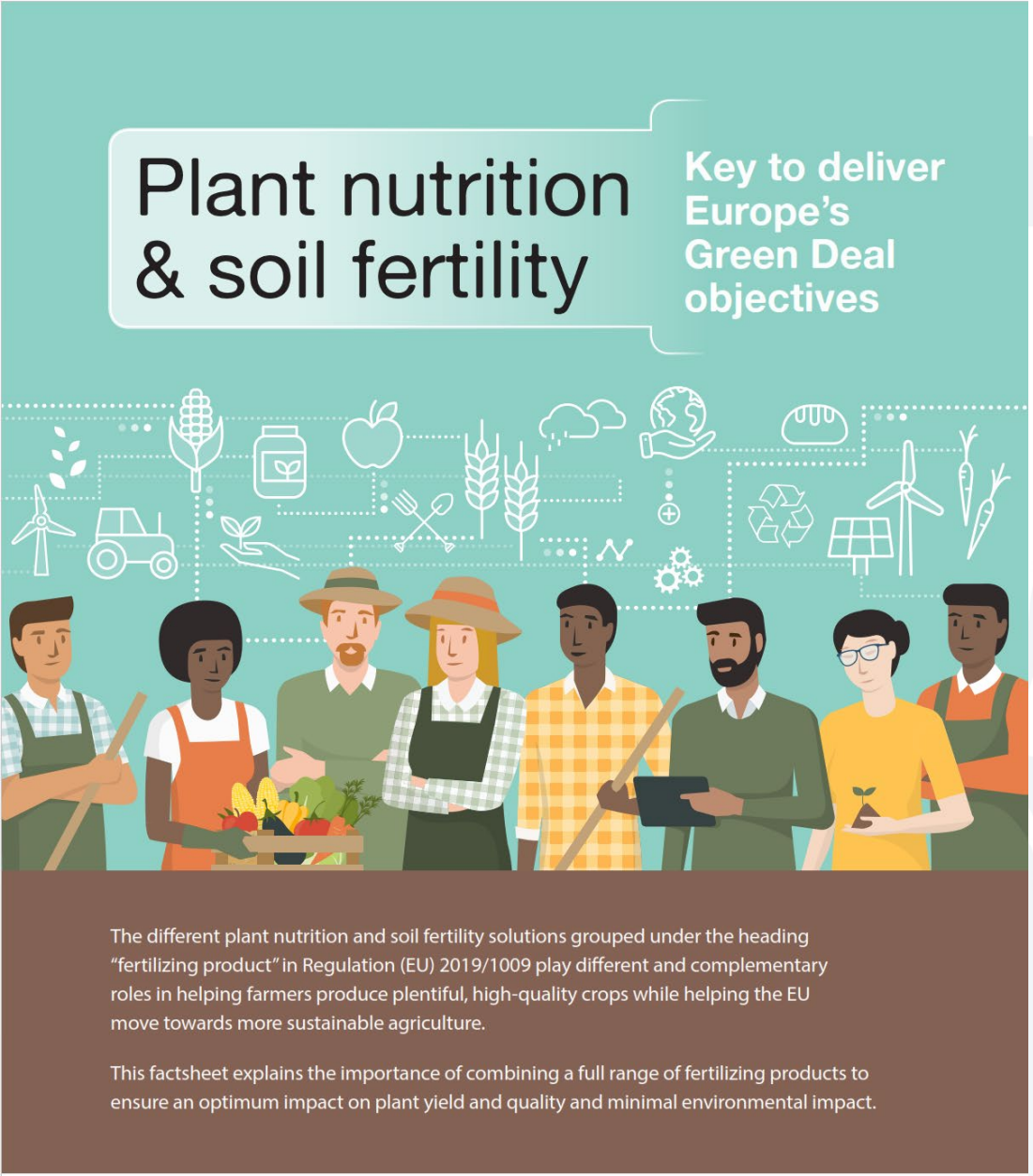
Image: ICL

Soil Health

This means that plant biostimulants contribute to all of the principles of soil health as defined by USDA, except for minimizing disturbances.



Source: USDA



Learn more about how plant biostimulants work together with mineral and organic fertiliser to optimise plant nutrition and soil fertility:

https://biostimulants.eu/wp-content/uploads/2022/02/Plant-nutrition-trifold-web-version-FINAL.pdf

Failed harvests = wasted nutrients

By helping crops cope with heat, drought, and other harsh conditions, plant biostimulants not only prevent the nutrient waste that would result if a crop is lost to bad weather, but they also and help maintain crop cover which helps prevent erosion and foster water retention.

Source: Adobe Stock

Scientific evidence about the benefits of biostimulants grows as product development and management improves

frontiers | Frontiers in Plant Science

SYSTEMATIC REVIEW
published: 14 April 2022
doi: 10.3389/fpls.2022.836702

A Meta-Analysis of Biostimulant Yield Effectiveness in Field Trials

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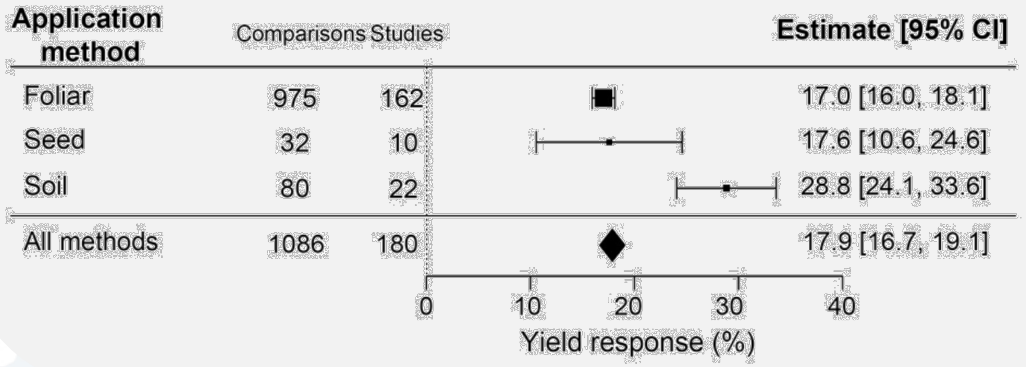
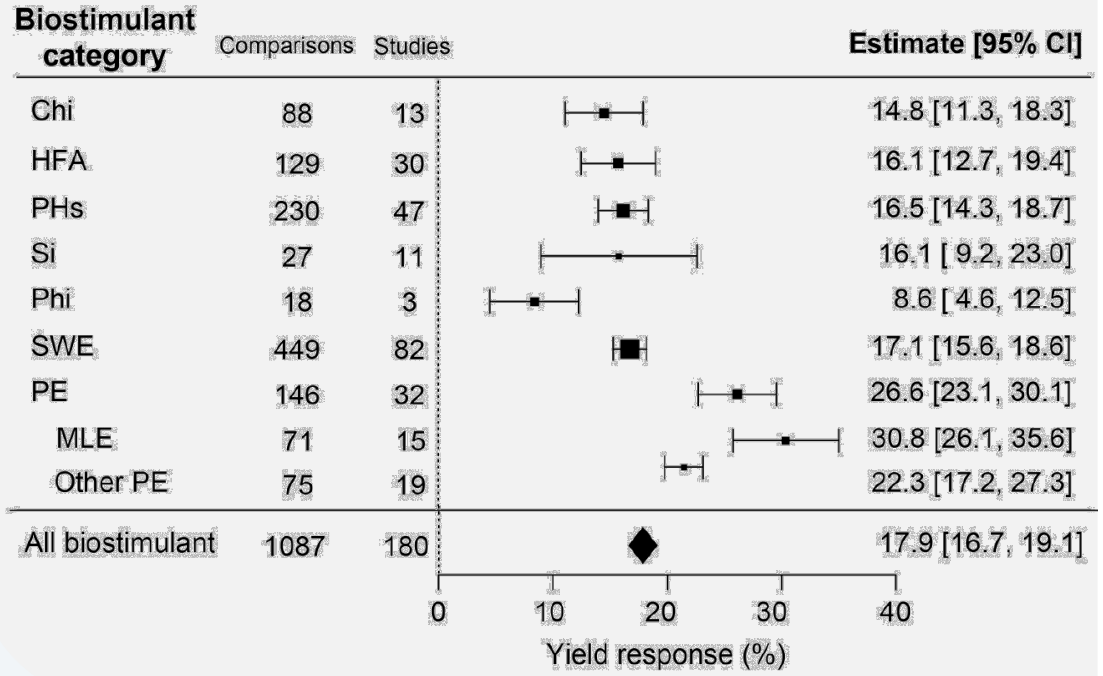
Percentage yield response to biostimulant application affected by application method



Percentage yield response to biostimulant application affected by the biostimulant category



17.9% yield increase

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The plant biostimulants sector invests significantly in research and development

Biostimulant (3-10%)

Mineral fertilizers 0.05%

3%

Percentage of annual turnover reinvested into R&D

Sources: EBIC "2011 Economic Overview of the Biostimulants Sector in Europe", USDA "Research Investments and Market Structure in the Food Processing, Agricultural Input, and Biofuel Industries Worldwide (20122), and IFA.

Photo: iStock

In conclusion

In just 10 years, plant biostimulants have moved from being viewed as “snake oil” to an essential element of efficient, regenerative farming that sees soil health and food production as intertwined goals.

Thank you !

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