



## From plant to plants: 100% plant-based solutions for plant nutrition

### INTRODUCTION

Plant nutrition and protection are at the heart of **growers'** requirements, to ensure optimal growth of their crops and meet the global food demand. Fertilizer use is essential, with estimates suggesting that global food crops would be around half their current levels without the addition of synthetic nitrogen<sup>1</sup>. It is crucial to ensure that plants have all the essential nutrients they need for their growth. That's why plant fertilization and soil nutrition are key components.

### Raising the challenge of sustainability with no compromise on yield

Moving towards more sustainability in agriculture, **growers** need to find alternative solutions to conventional fossil fuel-based fertilizers, to lower their environmental impact and respond to consumers' consciousness of how their food is cultivated. Yet, **growers** still expect optimum plant growth and crop yield results.

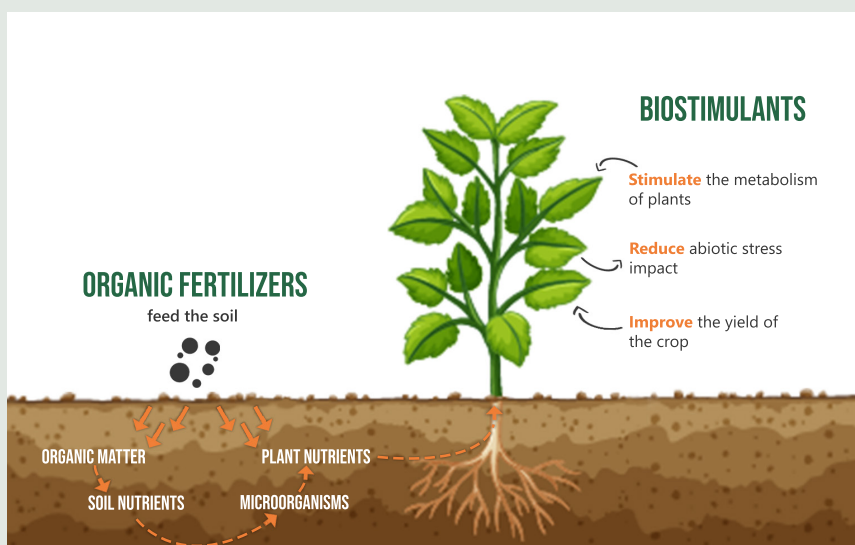
### A DEDICATED RANGE OF SOLUTIONS DEVOTED TO SOIL REPLENISHMENT AND PLANT NUTRITION

Roquette has developed a range of plant-based ingredients, specifically answering the need of **growers** for more environmentally friendly solutions for the nutrition of their crops.

This range of ingredients, refined for specific applications, conditions, and crops, helps **growers** substitute mineral and synthetic fertilizers for natural alternatives that offer:

- Balanced and optimized NPK (nitrogen, phosphorus, potassium)
- A combination of organic acids, vitamins, and other trace minerals
- And many other functionalities

Our range of plant nutrition ingredients are **used in foliar and soil applications and act as organic fertilizers or biostimulants** for fruits, vegetables, row crops, hydroponics, and in a wide range of other domains like gardening, for example.



### OUR PRODUCT RANGE

- [SOLULYS® Soluble corn protein](#)
- [NUTRALYS® Pea protein](#)
- [TUBERMINE® Potato protein](#)
- [GLUTALYS™ Corn protein](#)
- [NEOSORB® Sorbitol](#)
- [PEARLITOL® Mannitol](#)
- [Organic acids](#)

### THEIR FUNCTIONALITIES

- Provide key nutrients and growth factors
- Enable reduction of synthetic fertilizers
- Increase nutrient absorption
- Promote stress tolerance
- Improve germination
- Stimulate growth of plants

1. H. Ritchie and M. Roser. "Fertilizers." Our World in Data.org. Available at: <https://ourworldindata.org/fertilizers>



**PLANT -BASED ORGANIC FERTILIZERS**

Organic fertilizers nourish the soil and the plants and sustain their fertility without influencing characteristics. They come in a variety of natural origin products, as opposed to synthetic products. The Roquette range of plant-based ingredients dedicated to soil and plant nutrition has been refined for specific applications, conditions, and crops.

**Promotion of aerial plant parts and root growth, encouragement of dense root systems**

In comparative studies, our plant-based products have demonstrated to enable **growers** to reduce the use of mineral and synthetic fertilizers and offer balanced, optimized NPK (nitrogen, phosphorus, potassium) in combination with organic acids, vitamins and other trace minerals.

Lettuce on potting soil	Roots		Aerial part	
	Fresh matter	Dry matter	Fresh matter	Dry matter
Synthetic fertilizer	+267%	+295%	+351%	+411%
SOLULYS® 048 soluble corn protein	+367%	+359%	+230%	+278%

Table 1: The lettuce data illustrate plant-derived products' ability to deliver comparable performance to the standard NPK fertilizer and substantially superior growth characteristics relative to the negative control. Each product provides an equivalent amount of nitrogen. The results presented are the improvement percentage compared to the negative control.

The plant treated with SOLULYS® 048 soluble corn protein showed excellent growth. This demonstrates it benefited from all the nutrients necessary for its development. The aerial part and roots evolved in a similar way showing that the product acted as an organic fertilizer. It participated in the nutrition of the plant and therefore in its development as a whole.

**BIOSTIMULANTS WITH MEASURABLE IMPACT**

Biostimulants stimulate the process of plant nutrition independently of the nutrients they contain, for the unique purpose of improving one or more of characteristics of plants or their rhizosphere like nutrient utilization efficiency, tolerance to abiotic stress, quality characteristics, and availability of nutrients confined to the soil.

**A consistent range with substantial potential for multiple crops**

Our range of ingredients for plant nutrition include organic biostimulants with well-controlled properties that have delivered proven benefit in trials with crops such as tomatoes, lettuce, cress and turfgrass.

Tomato plantlets on inert media	Roots		Aerial part	
	Fresh matter	Dry matter	Fresh matter	Dry matter
Synthetic fertilizer	+49%	+66%	+377%	+166%
SOLULYS® 048 soluble corn protein	+106%	+103%	+291%	+116%

Table 2 : Data for tomato plantlets illustrate the ability of plant-derived products to stimulate the plants development. They are grown on inert media with minimum nutritive elements so that plants are closed to nutritive stress. Each product provides an equivalent amount of nitrogen. The results presented are the improvement percentage compared to the negative control.

The results show that overall SOLULYS® 048 soluble corn protein performs extremely well relative to the negative control, delivering comparable growth characteristics to the commercial NPK fertilizer.

However, in terms of root development, this is markedly better with SOLULYS® 048 soluble corn protein. The plant-based treatment encourages the growth of a dense root system, with the shorter maximum root length attributable to an ability to thrive in the environment local to the root origin.

Deconvoluting fertilizer and biostimulant effects is complex, but these data are consistent with SOLULYS® 048 soluble corn protein having a beneficial effect on the soil and/or the microbial population within the rhizosphere. It is also worth noting that the high solubility of the synthetic fertilizer, though beneficial for rapid assimilation, means that much of the application is easily washed away and lost.

In contrast, the organic, plant-based product is more likely to be retained in the growing medium, increasing the chance of beneficial impact on root development. This development allows a better assimilation of the nutritive elements by the plants.

To find out more about our plant-derived products for plant nutrition and protection products and how they can help you formulate an optimized plant care solution for your needs, check our [website](#) and [contact us](#)

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