



Fertilizers
Europe



Micronutrients in food production

Essential for plant growth
and development

Did you know?

Micronutrients



Boron



Cobalt



Copper



Iron



Manganese



Molybdenum



Zinc

Boron plays an important role in the production of amino acids and the **development of flowers and fruits.**



Manganese is crucial for activating enzymes. It is also essential for **water splitting**, which is the first step of photosynthesis.



Molybdenum and cobalt help turn nitrogen into usable forms, in particular **nitrogen fixation** in legumes.



Copper, iron, and zinc are **enzyme components.** Enzymes act as catalysts for enzymatic reactions.

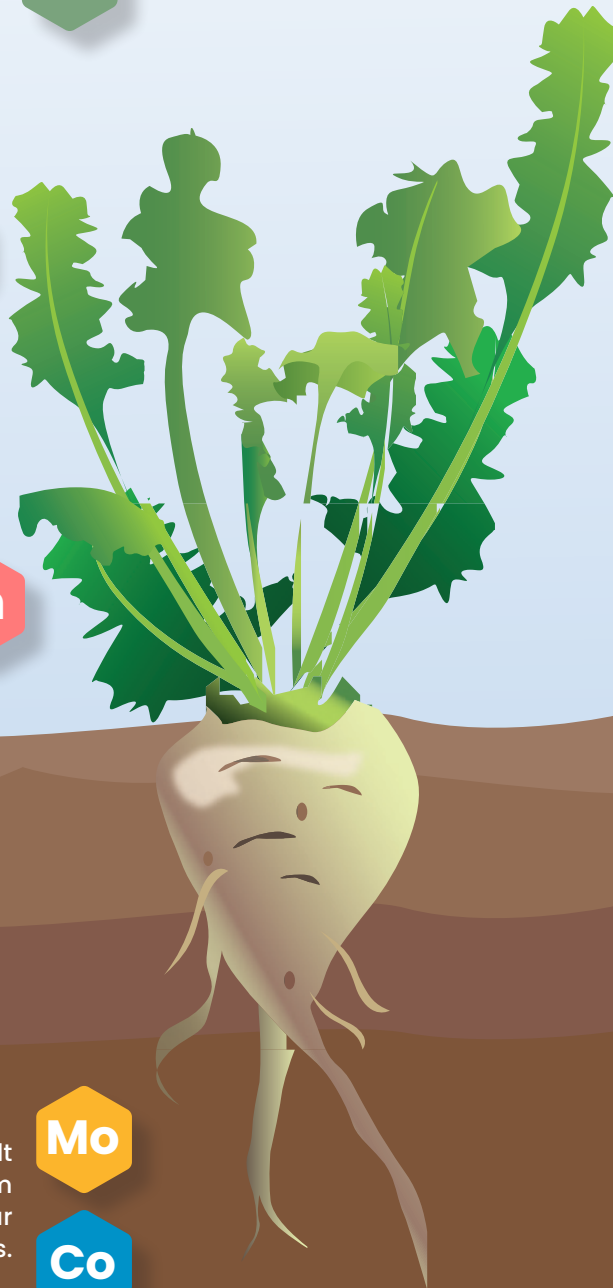
Zinc is required for **energy transfer** and **nitrogen reduction** and **fixation.**



Copper and iron play an important role in **photosynthesis.**



Molybdenum and cobalt assist in the metabolism of nitrogen, in particular **nitrogen fixation** in legumes.



Micronutrient sources available to farmers

Farmers cannot profitably grow food without micronutrients.

This publication covers micronutrients as recognized in the EU Fertilizing Product Regulation; there are additional elements* that may contribute to overall plant growth and health.

Micronutrient deficiency in soil can result from numerous causes, including, lack of the specific nutrient, soil water content inhibiting nutrient uptake, and lack of bioavailable sources. Specific soil types and soil pH levels can influence the likelihood of deficiency in plants.

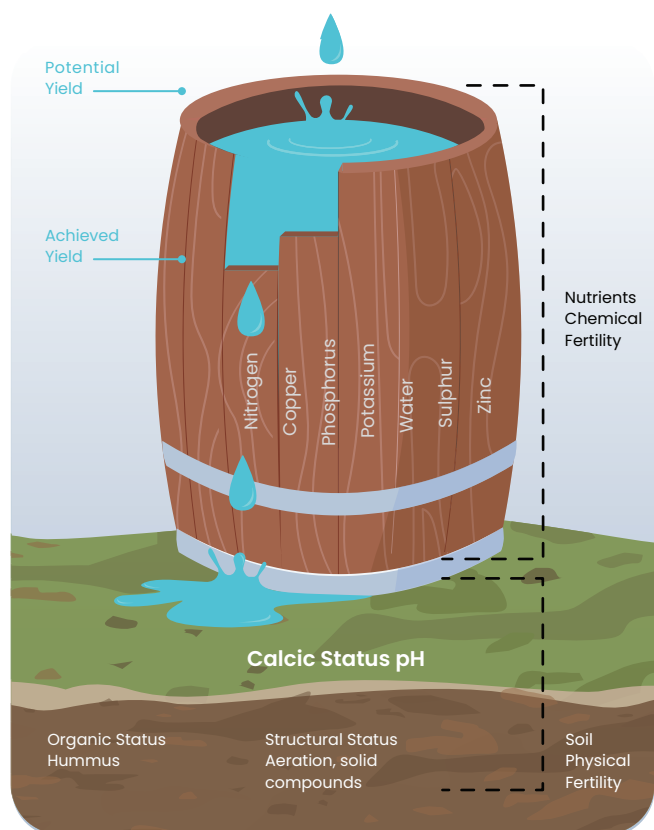
A combination of fertilizing products can be used to address a deficiency of micronutrients. The uniform application of micronutrients to soil can be difficult due to the small quantity required so foliar feeding is the primary method of fertilization. However, in the unlikely event of soil fertilization, uniform application can be improved through the use of an NPK fertilizer as a carrier of micronutrients.

The best practice for the application of foliar sprays is to use products specially formulated for foliar application. The use of foliar sprays should be done with special attention to the product directions, life stage of the plant, and the climatic conditions during and following application.

* Brown, P., Zhao, F.J., Dobermann, A. What is a plant nutrient? Changing definitions to advance science and innovation in plant nutrition. 2022.

Mineral fertilizers containing micronutrients have several advantages:

- Contain predictable amounts of micronutrients
- Provide micronutrients in plant-available forms
- Suited to precision farming technologies
- Minimize nutrient loss
- Allow for a uniform application of very small quantities over wide areas



“Filling the ‘barrel’ goes well beyond yield to achieving marketable quality standards, and to improving the nutrient content / density of crops and therefore their contribution to human and animal diets; all of which can be achieved by appropriate and balanced micronutrient fertilizer inputs!”

1 Moran, K. Micronutrients: Beyond Crossroads—on the Highway. 2007.

Balancing crop nutrition for healthy crops and fertile soils

A good crop feeding strategy at farm level can be achieved with a balanced supply of the nutrients needed. Balanced nutrition is essential to help crops reaching high yields and quality, moving towards a crop's maximum genetic potential.

Balanced plant nutrition is a vital element of sustainable crop and soil management. As the understanding of plants develops, the effects of more micronutrients are being discovered. Micronutrients are an essential part of healthy crops, yet they usually make up less than 1% of a plant's dry weight. However, even in small quantities they ensure optimal growth. Micronutrient deficiency can disrupt critical plant functions which can not only result in poor plant development, but also a reduction in growth and yield. Micronutrients are of increasing interest to farmers, as the increase in crop yields has reduced soil micronutrient content and increased the need for targeted fertilization.

Most micronutrients become unavailable in higher pH soils (>7) and become more readily available in soils with a pH between 6 and 7. Most micronutrients are added to the soil through the decomposition of organic material. However, a micronutrient deficiency can also result from increased crop yields, or due to nutrient imbalance, which can be caused by overly manured soils.

Farmers are able to detect deficiencies through symptomatic representations, soil testing, plant analysis, and through proper field monitoring. To remedy a micronutrient deficiency or imbalance, individual micronutrient fertilizers can be used to fulfill nutrient requirements for healthy crop growth and development.



Interested in knowing more about plant nutrition?

Have a look at our other publications.

<https://www.fertilizerseurope.com/fertilizers-in-europe/balanced-plant-nutrition/>

