BioWerm Techno supports nitrogen (N) uptake – the key to efficient fertilization

Nitrogen (N) is one of the most important nutrients for plants and a cornerstone of modern agriculture. Its role is invaluable, as it participates in fundamental life processes without which plant growth and yield would be impossible.

The importance of nitrogen in plant development

Nitrogen is essential for the formation of:

- proteins (enzymes, cellular structures),
- nucleic acids (DNA, RNA),
- chlorophyll – the green pigment responsible for photosynthesis.

Without sufficient nitrogen, plants cannot develop properly, which directly affects their condition and productivity.

The impact of nitrogen on growth and yield

Nitrogen (N) strongly influences:

- rapid growth of green parts (leaves and stems),
- intensive tillering in cereals,
- overall yield mass.

Well-nourished plants are more vigorous, have an intense green color, and higher production potential.

Proper nitrogen fertilization:

- increases yields,
- improves quality (e.g., protein content in cereal grains),
- supports the development of yield-forming organs.

Effects of nitrogen deficiency and excess

Nitrogen deficiency causes:

- stunted growth,
- yellowing of leaves (chlorosis),
- significant yield reduction.

Excess nitrogen leads to:

- excessive development of green parts at the expense of yield,
- increased susceptibility to diseases,
- lodging in cereals,

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- environmental pollution (nitrate leaching into water).

Improper nitrogen use may additionally result in:

- water eutrophication,
- greenhouse gas emissions (e.g., nitrous oxide N_2O),
- soil degradation.

Forms of nitrogen available to plants

Plants absorb nitrogen only in specific chemical forms:

1. Nitrate form (NO_3^-)

- highly soluble in water,
- quickly available,
- easily mobile in soil (risk of leaching).
  Significance: responsible for rapid growth, especially in early stages.

2. Ammonium form (NH_4^+)

- bound by soil (lower losses),
- more slowly available,
- can be toxic in excess.
  Significance: supports root system development and stable nutrition.

3. Amide form (NH_2) – e.g., in urea

- not directly absorbed,
- requires transformation: urea → NH_4^+ → NO_3^-,
- slower acting.

4. Atmospheric nitrogen (N_2)

- makes up about 78% of the air,
- available only to leguminous plants thanks to nitrogen-fixing bacteria.

5. Organic forms

- present in organic matter,
- require mineralization by microorganisms.

The role of BioWerm Techno in efficient nitrogen use

BioWerm Techno is a solution that supports natural processes in the soil, directly influencing nitrogen availability and uptake by plants. Its action is based on activating soil microbiological life, which results in:

- improved mineralization of organic matter,
- more efficient conversion of nitrogen into plant-available forms (NH_4^+ and NO_3^-),
- reduced nitrogen losses through leaching,
- improved soil structure and nutrient retention capacity.

As a result, plants can utilize available nitrogen more effectively, increasing fertilization efficiency and reducing excessive application.

Summary

Plants mainly absorb nitrogen in two forms:

- NO_3^- (nitrates) – fast-acting,
- NH_4^+ (ammonium form) – more stable source.

Efficient nitrogen management is not only about the amount of fertilizer, but above all its availability to plants. In this context, BioWerm Techno provides valuable support by enabling better use of available nitrogen resources, improving yields, and reducing the negative environmental impact of agriculture.

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