LIQUI-PLEX®

Yeast extract for crop nutrition

Poor plant nutrition, depleted soils and herbicide stress can have a major impact on crop health and productivity and as a result, come at a high cost. Derived from yeast extract, LIQUI-PLEX® solutions from Alltech Crop Science use the inherent complexing nature of amino acids to optimize nutrient bioavailability to the plant. Amino acid complexing leaves no synthetic residues in the soil and foliar application allows for rapid uptake and utilization in response to soil depletion and herbicide stress.

Why yeast extract?

The yeast cell has many valuable uses when it comes to crop production. Yeast extracts—the interior contents of the cell—are rich in a wide variety of amino acids, which can complex with trace minerals for improved nutrient bioavailability.

What is mineral complexing and chelation?

These terms refer to chemical bonds between a mineral and some other molecule—in this case, the amino acid. This bond helps bypass undesirable chemical interactions in the surrounding environment, ensuring that the desired nutrient is delivered rapidly and efficiently into the plant.

What if I use a synthetic chelating agent?

Synthetic chelating agents such as EDTA can be *too* strong. Described as having "separation anxiety," they must always hold onto something. When releasing iron, for example, they may bind a different nutrient such as manganese, making it unavailable to the plant and causing a new deficiency. What's worse, because they are of no other use to the plant, these synthetic agents are discarded and accumulate in the soil over time. In contrast, amino acids may be utilized by the plant once they have delivered their mineral payload.

What kinds of amino acids are present?

Unlike most sources, which contain only a handful of amino acids, yeast extracted from *Saccharomyces cerevisiae* SP.1026 provides at least 18 of the amino acids essential for plant development.

Don't plants synthesize all of their own amino acids?

Yes, under ideal conditions, plants synthesize all the amino acids they need. However, outside factors such as herbicide stress can interfere with amino acid synthesis, negatively impacting plant development. A number of independent studies have shown that amino acid supplementation can help speed up plant recovery from herbicide stress.

How does this yeast extract integrate with my existing crop nutrition program?

LIQUI-PLEX® BONDER provides the standalone yeast extract in a concentrated liquid form, which can be included your tank mixes to improve the bioavailability and uptake of your existing nutrition program.

We also offer various LIQUI-PLEX® formulas that come pre-mixed with essential micronutrients (e.g. LIQUI-PLEX® Cu, LIQUI-PLEX® Zn, etc).

How should LIQUI-PLEX® BONDER be used?

LIQUI-PLEX® BONDER is best used between 16 – 32 oz/acre, depending on crop conditions. Consult an Alltech Crop Science specialist for recommendations on specific micronutrient blends.

When should LIQUI-PLEX® solutions be used?

LIQUI-PLEX® solutions are best used in advance of an anticipated nutrient shortfall. However, because of their excellent uptake and bioavailability, they can also provide rapid response and recovery from any unexpected deficiencies.

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Benefits of **yeast extract** in plants

1. **Protein Synthesis**
   The plant must synthesize all proteins from available amino acids. Anytime additional amino acids are supplied to the plant, it is "free food" that the plant did not have to spend energy to create.

2. **Stress Resistance**
   Stressors — such as high temperature, low humidity, frost, pests, hail and flooding — have a negative effect on a plant's metabolism with a corresponding reduction in crop quality and/or quantity. Amino acids are directly related to stress physiology, and as such, the application of amino acids before, during and after stressful events has a preventing and recovering effect on the plant.

3. **Effect on Photosynthesis**
   Glycine and glutamic acid are fundamental metabolites in the processes of chlorophyll synthesis and forming plant tissue. These amino acids help increase chlorophyll concentration in the plant, leading to more photosynthesis and making crops a darker green color.

4. **Action on the Stomas**
   The opening of the stomas is controlled by both external factors (light, humidity, temperature and salt concentration) and internal factors (amino acids concentration, abscisic acid, etc.). The stomas are closed when light and humidity are low and temperature and salt concentration are high. When stomas are closed, photosynthesis and transpiration are reduced — which means a low absorption of nutrients — and respiration is increased, leading to carbohydrate destruction. As a result, the metabolic balance of the plant is negative. Catabolism is higher than anabolism, which implies slow metabolism and stops the plant's growth. Glutamic acid acts as an osmotic agent of the "guard cell" — thus, favoring opening of the stomas and improving nutrient uptake.

5. **Chelating Effect**
   The neutral charge and plant recognition of the amino acids allows products to be introduced to the plant quickly and efficiently. They are also much better for the environment than EDTAs.

6. **Amino Acids & Phytohormones**
   Amino acids are precursors, or activators, of phytohormones and growth substances. Examples include methionine (a precursor of ethylene), tryptophan (a precursor for auxin synthesis) and arginine, which induces synthesis of flowers and fruit-related hormones.

7. **Pollination and Fruit Formation**
   Lysine, methionine and glutamic acid are essential amino acids for pollination, as they increase the pollen germination and the length of the pollen tube.

8. **General**
   Glutamic acid and aspartic acid, by transamination — that is, converting essential amino acids into nonessential amino acids — give rise to the production of other amino acids.

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