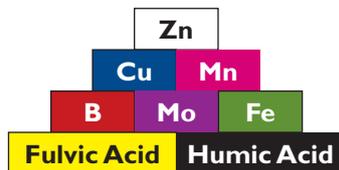


Micro Nutrient GRANULES Product Guide



The importance of micronutrients in blended fertilizer is essential. Micronutrients used correctly can supply the plant from the germination stage right through the season up to harvesting. The crop will never experience a micronutrient deficiency at any time in its life cycle. Different locations have proved time and again that it pays to fertilize with zinc sulphate and micronutrients.

MOST IMPORTANT MICRONUTRIENTS



JUSTUS VON LIEBIG'S LAW OF THE MINIMUM

Justus Freiherr von Liebig was a German chemist who made a major contribution to agriculture in the 19th century. Von Liebig's Law of the Minimum states that yield is proportional to the amount of the most limiting nutrient. Therefore, if the deficient nutrient is applied, yields may be improved to the point that some other nutrient is needed in greater quantity than the soil can provide, and the Law of the Minimum would apply in turn to that nutrient.



Due to the centuries-long use of animal dung for fertilisation, many early scientists believed that the nutrients needed by plants were organic rather than mineral. Liebig proved this theory wrong in research that showed that plants need mineral elements from the soil, carbon from carbon dioxide in the air and hydrogen and oxygen from water. Research made it clear that Liebig's Law of the Minimum also applied to micronutrients. Thus, if there is a shortage of any of the micronutrients, the farmer cannot achieve optimal production.

*Sources: Phillip Barak, University of Wisconsin, www.eurochem.ru; Wikipedia

YIELD INCREASES WITH DIFFERENT MICRONUTRIENT TREATMENTS AND LEVELS

YIELD INCREASE PERCENTAGE VERSUS CONTROL

| Composition & % Levels | Maize | Potatoes | Wheat | Cabbage | Castor Oil | Sorghum | Peas | Maize fodder |
|--|-------|----------|-------|---------|------------|---------|------|--------------|
| Zn, Fe, Mn (soil applied) 2% Fe, 0,5% Mn, 5% Zn, 0,2% Cu, 0,5% B | 29,2 | 13,6 | -5,0 | 5,0 | 27,7 | 14,8 | 17,0 | 38,3 |

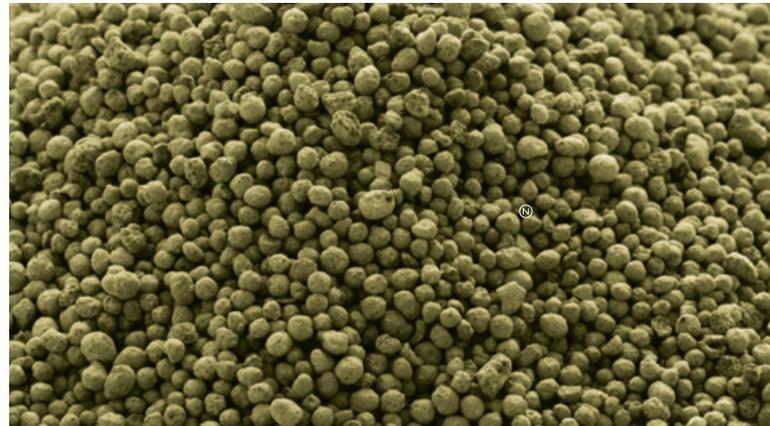
Explanation: Zn = zinc, Fe = iron, Mn - manganese, Cu = copper, b = boron
Indian Microelement Manufactures Association – Oct to Dec 2008

WHAT SOIL TYPE DO YOU HAVE?

Expected Deficiencies

| SOIL TYPE / PROPERTY | DEFICIENCY |
|--|---------------------------|
| Highly leached sandy soils | B, Cl, Cu, Fe, Mn, Mo, Zn |
| High pH soils – pH (>7) | B, Cu, Fe, Mn, Zn |
| Calcium carbonate (>15%); Calcitic soils | B, Cu, Fe, Mn, Zn |
| Soils with freshly applied lime | B, Cu, Fe, Mn, Zn |
| High salt soils | Cu, Fe, Mn, Zn |
| High organic material (>10%) | Cu, Mn, Zn |
| Acid Soils | Cu, Mn, Zn |
| Heavy clay soils | Cu, Mn, Zn |
| Gleysols – Marshy soils | Zn |

Different micronutrient products with varying water solubilities are available in the market. Farmers must try to buy the products with the highest water solubility to ensure their availability to the plant.



MAJOR BREAKTHROUGH!

Three factors control the correct application rate of micronutrients and with a soil micronutrient analysis; the correct recommendation can be made.

- The micronutrient soil level before planting.
- The rate of leaching and the speed at which it moves through the soil profile.
- The degree of micronutrient uptake by the plant

The most important factor is the micronutrient analysis of the soil. Sampling is therefore essential. The problem encountered by farmers in applying micronutrients is that most are provided in a powder or compound format. The industry came up with a solution by creating a micronutrient granule which could easily be added in a fertilizer blend. Vipa as the appointed distributor of this product, are now the preferred source of micronutrients by blenders and farmers.

