

Humate and Humic Substances

Humic substances and rock phosphates

The stimulatory effects of humic substances have been directly correlated with the enhanced uptake of macronutrients such as nitrogen, phosphorus and sulphur and micronutrients Fe, Zn, Cu and Mn.

Humic substances enhance the uptake of minerals through the stimulation of microbiological activity. Humic substances actually coat mineral surfaces, which aid in the solubility of otherwise insoluble compounds by dissolving, complexing, and chelating the dissolved nutrients.

Humic substances can improve the effectiveness of rock phosphate causing the release of PO₄-anions and CA₂+ cations from hardly soluble rock minerals because high total acidity and its ability to complex and chelate the resulting solution and to stimulate the microbial metabolism.

Research has also confirmed that combining rock phosphate with humate can increase the available phosphate analysis from near zero to over 10 %.

Calcium

Calcium and humic substances make a powerful combination. Many of the benefits of calcium overlap with the benefits of humic substance along with their biological stimulation and chelating capacity.

Humate and a dry lime source work as well if not better than other chelated calcium products, because the humic substances are known to complex both cations and anions, creating a synergistic effect, resulting in the combination, is greater than the individual ingredients. Humic substances

are responsible for kelation of calcium holding these in a bio-available form.

Conclusion and pathway to sustainability

The conventional tools of chemistry have not been able to explain why these materials work in the complex soil ecosystems.

They have all the qualities of humus, but are not humus, and are available as humate in dry powers or humic acids and fulvic acids in liquids. Because of their ability to improve fertiliser efficiency, humic substances are best utilised as part of a total fertiliser program blended into fertilisers.

Humates, humic acids and fulvic acids are powerful biological tools which the benefits should result in.

- Biological release of nutrients from otherwise insoluble materials
- Root growth
- Nutrient uptake from larger root mass
- Respiration
- Photosynthesis
- Mineral bioavailability and stabilisation
- Nitrogen stabilisation and fertiliser efficiency
- Disease resistance.

Humic substances are critical components of water and soil ecosystems. The vast agronomic and environmental importance of these materials is just beginning to be appreciated.

The ecological and plant-nutritional benefits provide sufficient justification for using these extraordinary complex eco-minerals.

Humic substances also chelate iron, zinc and copper and complex with many other trace elements. Elements typically found in natural phosphate minerals such as zinc and copper, are known to suppress pathogens and encourage the growth of beneficial organisms.



Don Hart standing in a wheat field that had no fungicides or insecticides applied and recieved less than 90kg N/HA, demonstrating the benefits of soil heathl.

D.L. HART 25.2.2011

HEALTHY SOILS principal objective is to offer a range of products and services that can restore the **MINERAL** and **MICROBIAL** balance in the soil, thereby reducing the need for high analysis fertilisers and chemicals.

Also to optimise fertiliser and nutrient availability is increased with all essential soil nutrients, not just NPK, with balanced solid mineral programs and specific liquid bio stimulants and microbial food.

Including - a comprehensive **SOIL** or **PLANT** **SAP** test analysis, interpretation and recommendation.

“We can not solve the problems of today using the same thinking that we used to create them”. Albert Einstein.



Healthy Soils

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