BIOMIN™

WHAT ARE BIOMINS?

Biomins are plant trace elements, which have been developed by JH Biotech of California USA, a leading company in mineral nutrition research. Biomins are specially formulated chelates. The chelating agent or rather enveloping substance used in their formulation is Glycine: the smallest of all Amino Acids – the building blocks of Proteins.

Through the chelation process, the micronutrients are made more available to plants, and are safer to use than inorganic minerals or synthetic chelates. Biomins are available in individual minerals and in multi-nutrient formulas called "Boosters". Biomins are for both soil and foliar applications; they are completely organic and suitable for use in both conventional and organic farming preventing and correcting mineral deficiencies.

WHAT ARE CHELATES?

The idea of chelation is basically to isolate the Trace Element from hostile surroundings that would interfere with its availability. Many chelating agents are in use. Not all of them however are effective as far as plant nutrition is concerned. The problems of synthetic chelates such as EDTA, DTPA, EDDHA and complex chelates, such as lignosulfonates are many:

1. **Size:** Such chelating agents have gigantic molecules. They cannot be absorbed intact. Even when used as foliar sprays, they have to release their chelated mineral before the mineral can be absorbed, and thus losing their chelating structure.
2. **Mineral Preference:** Some chelating agents prefer to chelate certain minerals more than others. If Zinc – EDTA for example is used to correct Zinc deficiency in a medium containing Calcium, the EDTA molecule will almost immediately release the Zinc and replace it with Calcium and thus fails to deliver the Zinc and at the same time it creates other problems by locking up Calcium.
3. **Bio-Availability:** Gigantic chelate molecules can in fact penetrate through the leaves' vent (the stomates) only when those stomates are open. Even then, the plant will have to transform this chelate into a natural Bio-available chelate that it can utilize. Such a transformation requires both time and energy. Energy consumption requires expenditure of Phosphorus, a mineral already rare during cold winter days when its availability is next to nil.
4. **Toxicity:** Many synthetic and complex organic chelating agents are phytotoxic especially when used in high amounts and on long term.
5. **Stability:** Chelates vary in their stability constants. In this regard, the best chelates are those that are assimilated immediately after they are applied and before, they get the chance to break down.

SOIL HEALTH · PLANT HEALTH · YOUR HEALTH

WWW.RD2.CO.NZ

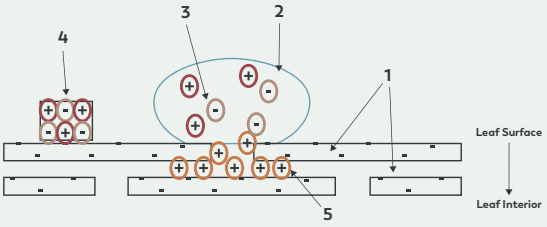
Phone 09 372 9155 or email rsf@rd2.co.nz for any enquiries.

WHAT ARE THE ADVANTAGES OF USING BIOMINS?

Chelates were introduced into the world of agriculture some 40 years ago.

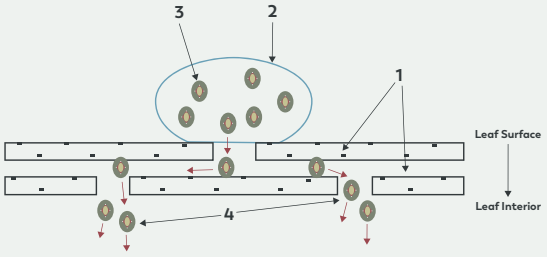
Relentless research has developed many newer and better chelates ever since attempting to achieve better performance and higher crop yields. BIOMINS so far are the newest and most advanced of them all. Their advantages are numerous:

1. **Size:** BIOMINS have the smallest molecular size that a chelate can ever have. With an average molecular weight of nearly 200 (compared to 1500 in the case of other chelates), they can easily penetrate through the waxy epidermis of the foliage of many field crops and ornamentals even at night when the stomates are totally closed.
2. **Ease of Assimilation:** Owing to their extremely small size, Biomins are assimilated very promptly. When used as foliar sprays, overhead sprinklers can safely be turned on only four hours after spraying.
3. **Excellent Rate of Assimilation:** Unlike applied salts and / or other forms of chelates where the rate of assimilation could be as low as 1.4%, the rate of absorption of BIOMINS is pretty close to 99%.
4. **Bio-Availability:** Plants can and do utilize Biomins as they do not require to be changed in to other forms. This will not only help reduce demand of energy, but will also save time and enhances early and balanced plant and crop maturity.
5. **Reducing Stress:** BIOMINS not only help reduce energy demands in cold winter days, but also help reduce heat and drought stress simply by maintaining a healthy plant.
6. **Stability:** Because Biomins are made of units of amino acid, they are not rendered easy victims for microbial hydrolysis.
7. **Safety:** BIOMINS are totally harmless to plants even when recommended rates are exceeded. Exceeding recommended rates is however unnecessary.
8. **Environmental Safety:** Biomins are totally harmless to both human and wild life and are totally free of pollutants and toxins.
9. **Higher Yields and Earlier Crops:** When Biomins are used according to the crops' needs they will provide balanced nutrition, which will ultimately mean earlier crop maturity as well as higher yields. By pushing towards this early maturity, crop yields do not suffer at the expense of useless vegetative growth as in the case of improper pushing with nitrogenous fertilizers. For crops that pick over a long period of time (e.g. Cucumbers, Roses Carnations, Tomatoes, etc.) the picking season starts earlier and finishes later than normal. Seasonal crops mature considerably quicker enabling the grower to benefit from good market prices.
10. **Nitrogen Sparing Effect:** Because BIOMINS are Glycinates; they do contain a small percentage of Organic Nitrogen (2.0 –2.5%). Though low, this percentage can be of significance in times of stress.



TRADITIONAL MINERAL FERTILISER APPLIED TO LEAVES

1. **Cuticle layer of leaf with negatively charged fatty acids (so are the pores on the root surface).**
2. **Water droplet containing ionic solution of mineral.**
3. **Free, electrically charged ions (+= nutrient, -=counterion e.g. sulphate).**
4. **Undissolved mineral not available to plant.**
5. **Positively charged mineral bound to fatty acids: unavailable for plant use.**



AMINO ACID CHELATES APPLIED TO LEAVES

1. **Cuticle layer of leaf with negatively charged fatty acids.**
2. **Water droplet containing dissolved chelate.**
3. **Electrically neutral amino acid chelate.**
4. **Electrically neutral amino acid chelate, relatively unaffected by the charged environment, rapidly penetrates into the leaf.**

Phone 09 372 9155 or email rsf@rd2.co.nz for any enquiries.