

BIOMINS™100 % Soluble Powders
Single and Multi mineral Combinations**GENERAL INFORMATION**

What is Glycine technology? It is a patented process of chelation whereby every element is bonded with two Glycine (smallest amino acid) molecules creating a fully chelated product. The plant recognises this molecule as a protein like Nitrogen, allowing it to travel in the phloem quite readily to the growing points such as flowers, fruit and roots where it is required, as well as replenishing leaf levels also. This allows the element to be a mobile element in the Glycine chelated form whereas metals normally have low mobility within the plant.

This Glycine technology has been labeled as **Bioamin™**, derived from Bio-available Mineral. **Biomins™** are true chelates which were specifically designed for use on plant crops. However, the methods of delivery of these elements are not conventional, like the delivery methods of products such as oxides, sulphates and EDTA based trace elements. The latter products can marginally reduce a deficiency, but the speed by which the elements are released from these products and transported into the growing points is very slow compared to the transportation of elements in the **Bioamin™** form.

For example, **Bioamin™** are the only formulation on the market that can effectively and economically deliver elements to the growing points of the crop without the risk of phytotoxicity. This form of chelation has provided tremendous advantages because of increased absorption and translocation of the minerals within the plant.

The **Biomins™** include the following formulations, Zinc, Boron, Calcium, Magnesium, Iron, Manganese and Copper, all as single minerals which are highly systemic, non-phytotoxic, 100% soluble, economical and will deliver results. **Bioamin™** are also registered with BioGro so that

GUARANTEED ANALYSIS

Dry Weight Basis %/w/w

As amino acid Chelates:

Bioamin Calcium (Ca)	15.0 %
Bioamin Magnesium (Mg)	12.0 %
Bioamin Zinc (Zn)	20.0 %
Bioamin Iron (Fe)	18.0 %
Bioamin Manganese (Mn)	18.0 %
Bioamin Copper (Cu)	17.0 %
Bioamin Boron (B) (complexed)	15.0 %
Bioamin Molybdenum (Mo)	8.0 %
Bioamin Booster V	(multi mineral combination)
Bioamin Z.I.M	Zn 8.5%, Fe 4.25%, Mn 5.67%

organic growers can also take advantage of this technology. Multi mineral combinations also exist.

ADVANTAGES & BENEFITS

Bioamin™ products have the smallest molecular size that a chelate can ever have resulting in easy penetration of leaf surfaces. **Bioamin™** are very stable in formulation and can be used on all horticultural crops at almost any stage of growth

Bioamin™ provides balanced nutrition supplying a range of essential trace elements. **Bioamin™** are 100% soluble.

Bioamin™ are excellent products to integrate into a management program from pre-flowering, throughout the season, as well as post harvest applications to replenish lost reserves of trace elements, Calcium and / or Magnesium in all crops, particularly tree and vine crops. This will enable improved bud fertility for bud burst and / or bud movement to proceed smoothly with all the necessary nutrients.

COMPATIBILITY

ALWAYS run a compatibility test before spraying with other chemicals.

PLANT & ENVIRONMENTAL SAFETY

Bioamin™ are totally harmless to plants even when recommended rates are exceeded. Exceeding recommended rates is however unnecessary.

Bioamin™ are totally harmless to both humans and wildlife and is environmentally friendly.

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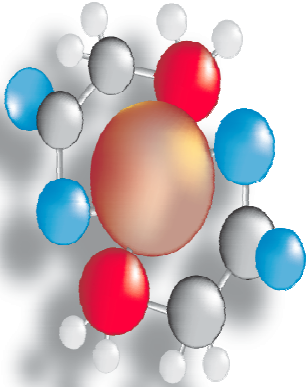
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For information on application rates and timing for crops not listed on this brochure, please contact your local distributor or visit the RSF website at www.rd2.co.nz



It is always advisable that a leaf sample be taken before applying fertilisers to best ascertain the levels of elements and the nutrient requirements of the crop.



What is chelation?

Chelation is a natural process which occurs within plants. Elements are naturally chelated by plants into amino acid form before entry into the root system. These elements can only be utilised in this amino acid form in order to prevent absorbed nutrients from precipitation.

The same principle applies to foliar applied elements. Glycine chelates (amino acid) have been proven to be the most effective in supplying minerals to plants in order to correct nutrient deficiencies.

Glycine is the simplest amino acid with a molecular weight of 75. Chelates of glycine with cations have been fully studied and the picture to the left illustrates two moles of ligand (glycine) and one mole of metal forming a true chelate.

Above all, Glycine chelates have been proven to be the most effective, stable and economical products worldwide in the supply of plant nutrients.

Why Glycine?

Glycine is generally considered the simplest amino acid. Glycine is unique among the protein amino acids in that it is symmetrical. Glycine is the simplest amino acid, and is used in crop production as a chelating agent for micronutrients and has been used as a natural nitrogen fertiliser.

Additional Technical information

When a single chelating agent binds to an element, that element is considered 'complexed.' If the element is joined with an organic compound (amino acid) at two or more exchange sites to form a ring structure, then that structure is considered a metal chelate (Meister, 1999). Two amino acids will bind to a metal to form a chelate. Chelation makes otherwise unavailable compounds plant available under normal pH conditions (between 4.5–8.5). Chelated nutrients (Biomins) are more plant available than complexed nutrients (EDTA, EDDHA, Quelant etc), and complexed nutrients are more plant available than uncomplexed nutrients (Sulphates and oxides).

All amino acids have the potential to decompose into amines that can go into solution as plant-available nitrogen. Glycine appears to be the most used as a fertilizer source. (Meister, 1999)

The setting of this limit for the molecular weight of a metal amino acid chelate at 800 does more than guarantee a certain molecule will be a true metal amino acid chelate. It makes it a nutritionally functional chelate. It is a true chelate that can be absorbed as an intact molecule. A larger chelate requires digestion prior to absorption, thus destroying the chelate structure and taking away the advantages of consuming a metal amino acid chelate.

Specific Uses of Glycine:

Chelating agents for cation nutrients, plant growth regulators, substrate for microbiological products, fertilizer source of nitrogen.

Additional uses for Glycine.

Different amino acids may serve as the base for certain pesticides. For example, glycine combined with methyl phosphonate forms the herbicide glyphosate (Meister, 1999).

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