

GUIDE TO TREE FRUIT NUTRITION

Global competition is increasing the pressure on agriculture to produce higher-quality, affordable food products. The grower who prospers in the future must use his resources productively, manage his risks wisely, and maximize his returns on the investments in his crops.

Fertilizers are an important investment each grower makes in his crops. In order to maximize his returns on this investment, he must balance the needs for N, P, and K with the crop's requirements for the secondary and micronutrients. Without adequate amounts of each element available at each growth stage, the maximum potential of the crop cannot be achieved.

Amino Acid Chelates

Chelation is the process of attaching a specific organic molecule to a mineral in two places to form a molecular ring. The molecular ring holds the mineral like a lobster's claw, surrounding and protecting it from adverse interactions. Albion Plant Nutrition produces mineral nutrients chelated with amino acids. Amino acids are the basic building blocks of protein and are found in all living things. The chelation of minerals with amino acids provides a tremendous advantage because they increase the efficiency of absorption and translocation of the minerals within plants.

Only ALBION[®] has developed the technology to make true amino acid chelates.

Metalosate[®] Products are the most Effective Foliar Nutrients Available

In 1956 Dr. Harvey Ashmead created Albion Laboratories, Inc. After years of research, Albion's scientists began making landmark discoveries in mineral chelation. For these discoveries Albion would eventually receive over 150 patents worldwide in human, plant and animal nutrition. Albion remains the world leader in chelated mineral nutrition and the source for the highest quality, true amino acid chelated minerals on the market today. These chelated minerals

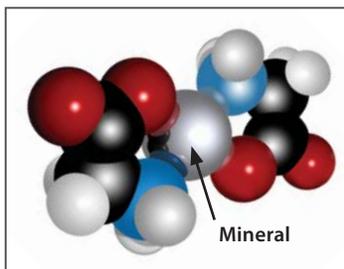
marketed by Albion Plant Nutrition are known as the Metalosate products.

Rapid Assimilation

Metalosate products are formulated for application directly onto plants as a foliar spray. This bypasses reactions in the soil, which can make the elements unavailable. Field and laboratory research studies have shown that Metalosate chelated minerals go to work within hours of application. This means there is less chance of nutrient loss resulting from rain or overhead irrigation. Visual responses are frequently observed within a few days of treatment where severe deficiencies exist.

Safe and Effective

Metalosate products can be applied to crops with less concern of phytotoxicity. Because the absorption of the amino acid chelates is so efficient, much lower rates of the mineral can be used to achieve measurable responses. Effective rates of Metalosate products can be used on sensitive crops without such problems as burning of leaves or marking of fruit or flowers.



Easy to Use

Metalosate products can be included in a total spray program on any crop. They can be tank mixed with most crop-protection chemicals. All of the Metalosate liquids are easy to measure and pour. Since there are no solubility problems, they will not settle to the bottom of tanks or clog screens and nozzles. They are not abrasive and will not cause wear on spray equipment.

Superior Value

ALBION brings high technology down to earth with cost-effective products. Calcium, magnesium, zinc, copper, iron, manganese, potassium, and boron are each formulated as separate Metalosate liquid products. This allows you to

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mix only the nutrients needed for your specific application without paying for unnecessary products. Broad-spectrum nutrient blends are also available for convenience.

Quality Support

As a service to the grower, ALBION operates a complete laboratory which performs mineral analyses of plant tissue. Through our unique **T.E.A.M.**[®] program, we will make recommendations for Metalosate products to fit your individual needs.

What and When

The following is a general fertility program formulated for use on mature, full-sized trees. This is not a complete program but one that takes into consideration the secondary and micronutrient needs of trees. These recommendations should be used as a guide for tree-crop nutrition. Adjustments can and may be made by you, your fieldman, and your local Albion representative to be in line with the cultural practices and conditions in your area.

Metalosate Zinc—16.0 to 48 fl. oz./ acre (1.2 to 3.5 L/hectare) per application.

- Zinc is important in the new growth of leaves and in activating many enzymatic systems.
- Zinc is slowly mobile within the plant.
- Zinc-deficiency symptoms include decreased stem length, reduced number of buds, rosetting of terminal leaves, small misshapen leaves, and often chlorosis. Reduced crop load and fruit size frequently results from the lack of adequate zinc in the tree.

Metalosate Boron—16.0 to 32 fl. oz. /acre (1.2 to 2.3 L/hectare) per application.

- Boron influences calcium utilization and cell membrane integrity which regulates the flow of nutrients into the cells.
- Boron is important in regulating how the plant uses energy for growth.
- Boron-deficiency symptoms include death of terminal growth, improper flowering and pollination, and reduced fruit quality.

Metalosate Iron—16.0 to 48 fl. oz./ acre (1.2 to 3.5 L/hectare) per application.

- Iron is essential in activating the enzyme system that builds chlorophyll.
- Iron is not mobile within the plant.
- Deficiency of iron often results in chlorosis of new growth. Symptoms are often very localized in an orchard.

Metalosate Manganese—16.0 to 48 fl. oz./acre (1.2 to 3.5 L/hectare) per application.

- Manganese is very closely related to iron in its functions within the plant. Deficiency symptoms often appear similar to iron deficiencies.
- Manganese is required for integrity of the chloroplast membrane and oxygen release during photosynthesis.

Metalosate Copper—8.0 to 16.0 fl. oz./ acre (0.6 to 1.2 L/hectare) per application.

- Copper is essential in the activation of many enzyme systems that are essential for carbohydrate metabolism, protein synthesis, and seed formation.
- Copper-deficiency symptoms include chlorosis and dieback of terminal shoots.

Metalosate Magnesium—32.0 to 64 fl. oz./acre (2.3 to 4.7 L/hectare) per application.

- Magnesium is the central core element of the chlorophyll molecule. It is mobile within the plant.
- Chlorosis of the older leaves is often the most common visible deficiency symptom of magnesium.

Metalosate Calcium—32.0 to 64 fl. oz./acre (2.3 to 4.7 L/hectare) per application.

- Calcium is an important component of cell walls. It is essential to cell wall integrity. It is not mobile within the plant.
- Calcium is the key in maintaining stem strength, fruit firmness, and regulating how cells absorb materials including nutrients across their membranes.
- Calcium-deficiency symptoms include bitterpit in apples, cork spot in pears, blossom end rot in tomatoes, and death of growing points.

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Metalosate Potassium—32.0 to 64 fl. oz./acre (2.3 to 4.7 L/hectare) per application.

- Potassium is involved in osmosis and ionic balance. It regulates the opening and closing of the stomata.
- Potassium is an activator of many enzyme systems and is freely mobile in the plant tissue. Within the plant, potassium functions in the manufacture of carbohydrates and translocation of sugars, promotes root growth, aids in the prevention of disease and increases fruit quality, color, and flavor.

Below are the basic programs that Albion Plant Nutrition recommends for applying Metalosate products to pome and stone fruit crops. These are general guidelines. You will want to fine-tune this program to fit your specific needs with the aid of your fieldman and local Albion representative.

Pome Fruit

Including apples and pears:

Metalosate Zinc—32.0 fl. oz./acre (2.3 L/hectare) at first cover spray.

- Albion strongly recommends a zinc maintenance program of 16.0 fl. oz. /acre (1.2 L/hectare) applied up to 8 times during the early stages of vegetative growth.

Metalosate Boron—16.0 fl. oz./acre (1.2 L/hectare) at 5% bloom and again at full bloom. Can be combined with calcium applications.

Metalosate Calcium—32.0 fl. oz./acre (2.3 L/hectare) at 5% bloom and again at full bloom. The full-bloom application is the most critical.

- Metalosate Calcium applications should continue throughout the growing season in at least 4 applications of 32.0 to 64 fl. oz./acre (2.3 to 4.7 L/hectare) per application. Six or more applications are recommended on varieties that are more susceptible to calcium related disorders.
- Depending on the results of Albion T.E.A.M. analysis, other Metalosate products can be applied in the early cover sprays.

Stone Fruit

Including apricots, cherries, nectarines, peaches, and plums:

Metalosate Zinc—32.0 fl. oz. /acre (2.3 L/hectare) during early leaf growth.

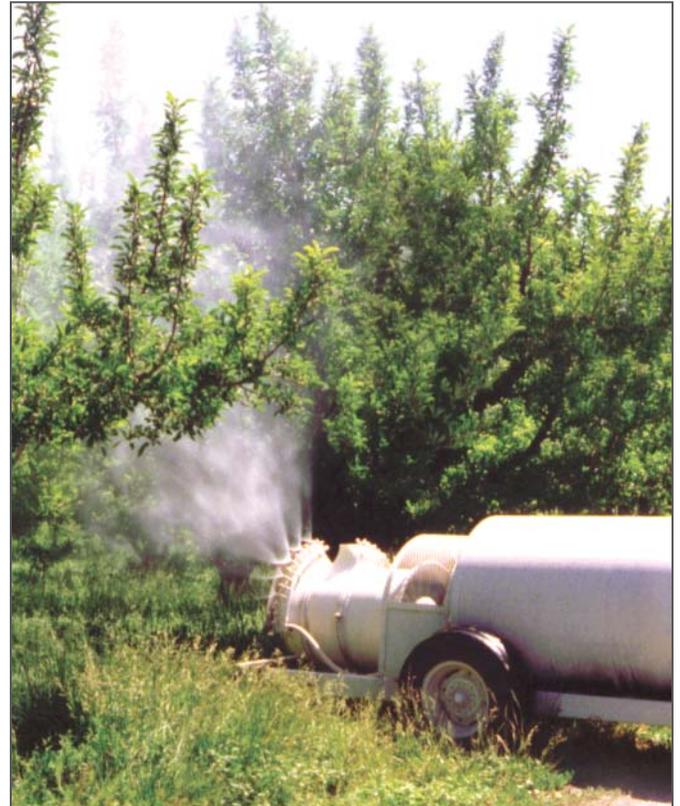
Metalosate Boron—16.0 fl. oz./acre (1.2 L/hectare) with bloom sprays.

Metalosate Calcium—32.0 fl. oz./acre (2.3 L/hectare) with bloom sprays.

- After petal fall, Metalosate Calcium at 32.0 fl. oz./ acre (2.3 L/hectare) in 3-4 applications through harvest will increase fruit firmness and reduce cracking.

Metalosate Potassium—32.0 fl. oz. /acre (2.3 L/hectare) starting at initial fruit color change. Make 2-3 applications up to harvest. This will help increase color, size, and flavor of the fruit.

- Other Metalosate nutrients as recommended by the T.E.A.M. program may be applied in the first cover sprays.



Metalosate®

Liquid Foliar Products

- » Boron
- » Calcium
- » Copper
- » Iron
- » Magnesium
- » Manganese
- » Potassium
- » Zinc
- » Crop-Up®
- » NPK
- » Multimineral™
- » MZ™
- » Tropical™
- » Zinc Plus™

Organic Foliar Products

- » Calcium
- » Calcium Boron
- » Copper
- » Iron
- » Magnesium
- » Manganese
- » Zinc
- » Crop-Up®
- » Multimineral™



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