# Citrus Nutritional Program

## Young Tree Management

### Reset to Profit

A primary objective of managing young trees is to accelerate tree development to profit producing status as quickly as possible. Optimum tree vigor and health is required to achieve this goal with nutrient management as the cornerstone of all the grower's practices. The young tree is in a continual state of producing root and canopy biomass. Increasing the amount of fibrous root surface supporting the tree's upper structure enhances nutrient and water uptake. Stems are needed to support tree canopy. Leaves are needed to produce photosynthates for root and canopy development. Nutrient management entails applying nutrients - in the right combination, at the right times, at the needed rates, and in the appropriate forms with properly managed irrigation.

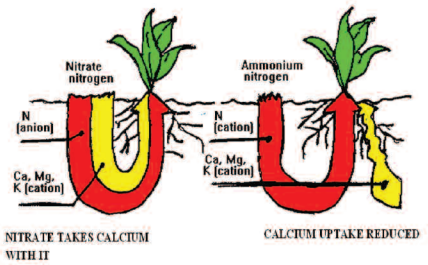
### Avoiding Failure

Failure to do one or more of the practices effectively results in diminished upper structure, smaller leaves, fewer leaves, and slower growth resulting in loss of profitability. Nitrogen, potassium and calcium, in descending order, are the major mineral constituents of shoot, root and leaf tissue. The application of these nutrients must be managed to optimize uptake as the tree needs them. Calcium is the least managed and most misunderstood of these three nutrients. Unlike nitrogen and potassium, calcium is immobilized in plant structures and becomes unavailable and is not translocated within the plant. Therefore, a continuous supply of water-soluble calcium must be available to meet production requirements. Many think if soil pH is maintained through lime application that the calcium needs of the tree are met.

### Calcium Uptake Management

Florida soils supporting citrus and limestone with an extremely low solubility are challenged to provide the available calcium that is needed to meet the desired levels of production. Management practices reducing N, K and Ca uptake must be avoided.

### Calcinit™ increases uptake




Application of ammonium forms of nitrogen reduces N, K and Ca uptake as these nutrients compete at the root surface. Nitrate sources do not compete but increase uptake of N, K, and Ca.

## Why be concerned about calcium

Optimizing the availability of calcium in the rooting zone increases uptake during mitosis and cell wall development. Maximizing the calcium concentration in the cell wall creates the greatest resistance to pathogen entry and tolerance to external stress factors such as drought and temperature.

Tree on left grown with Calcinit™ vs. Ammonium nitrogen on right.

## Avoid Ammonium

Without available calcium, root tip death will occur and tree vigor will be reduced. Root tip dieback also provides entry for fungal infection.

Fungi are the most serious plant pathogen in the root zone and prefer acidic soils. Ammonium nitrogen increases soil acidity and increases pathogen populations. Therefore, application of fertilizers containing ammonium-nitrogen increases root disease. On the other hand, fungi pathogenic activities are reduced with nitrate nitrogen and available calcium.

Calcium deficiency causes root tip death and increases potential entry of fungi.

## Calcium BMP

Calcinit supplies soluble calcium with non-acid forming nitrate-nitrogen that increases uptake of N, K and Ca. Both the calcium and nitrogen are available for immediate uptake providing the grower more control of the tree performance. Calcium may be the third most abundant element in the plant system but using Calcinit™ should be the first consideration of the grower in the young tree management program. Calcinit™ helps maintain soil pH, enhances root and upper structure growth, overall health and increases resistance to environmental factors while decreasing the amount of time it takes a young tree to become a profit generating member of the citrus grove. Calcinit™ incorporated in a good management program will provide the grower with a foundation that will support a productive and reliable future.

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