



Citrus Nutritional Program

Fruit Set Management



Changes Are Needed

Reducing production cost per box of fruit is best accomplished by increasing the amount of fruit harvested and marketed each year. High yields of top quality fruit will return more profit per box or acre than any cost saving practice a grower can implement.

Florida's Agricultural Statistics Service Citrus Summary for the production period between 1997/1998 – 2003/2004 shows a decline in estimated per tree production: for early and midseason varieties 9-13 and 14-23 years old, -0.6 boxes; and late oranges 9-13 years old, -0.1 box and 14-23 year old group -0.8 box. If the tree density is 115 per acre, then a loss of 11.5 – 92 boxes per acre is observed and profitability is lost. Growers cannot expect different results while continuing to adhere to the same practices year after year.

Growers may be perplexed when they have a healthy looking tree in August with little or no fruit. There is a subtle difference between growing leaves and the setting and production of fruit. Leaf loss can be replaced during the year but once lost, fruit will not be replaced. It is critical to set and hold fruit until harvested.

Critical Issues

The average number of flowers per tree during bloom will range between 50,000 – 200,000. Only a very small percentage of the flowers become fruit. A large number of flowers does not guarantee a large fruit set. Understanding the critical issues and employing the correct management practices during this period allows the grower to maximize fruit set and yield.

Let's Examine Some of the "Issues" Needing to be Addressed:

- 1) Flowering occurs during the cooler drier Spring season.
- 2) Since each flower, regardless of whether or not it develops into fruit, will draw

upon the nutritional supply available to the tree, it is critical to have essential nutrients available in abundant supply.

- 3) Cooler drier soil conditions reduce soil chemistry and microbial activity.
- 4) Developing flower buds are a low respiration/transpiration site.
- 5) Calcium influences pollen tube elongation (fruit set), mitosis (cell development) and abscission layer development (fruit drop).

Irrigation Must be Maintained

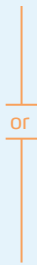
It is critical that adequate irrigation must be maintained during the flowering and early fruit developmental stages. Nutrient competition in the soil must be minimized and calcium uptake maximized. Calcium must be added in a highly soluble readily available form to be transported by the water to flower bud terminals. Additional sites (i.e. more flowers) require increased application of calcium to meet the increased demand. Failure to maintain



Yara Citrus Nutritional Program



4 Weeks
Prior to
Flowering



Bud Swell/0 Days

CN-9
10 lbs. of
N/per acre



Flowering/14 Days

CN-9
10 lbs. of
N/per acre



Fruit Set/28 Days

CN-9
10 lbs. of
N/per acre



Young Fruit/35 Days

Need 30 Mg.
of Ca per Fruitlet to
Avoid Fruit Dropping

30 mg calcium per fruitlet at five weeks increases fruit drop potential. Meeting minimal calcium requirements to prevent drop may not be enough to develop desired size of fruit. Attention also must be given to balancing the nitrogen and potassium requirements projected for the desired crop.

Nitrogen & Potassium Uptake

While the fruit takes up 70-80% of its calcium requirement in the 10-12 weeks following bloom, the uptake of nitrogen and potassium continues until maturity. Potassium uptake into the fruit averages about 18 pounds per 100 boxes. Nitrogen averages around 13 pounds per 100 boxes. It is important to maintain the nitrogen to potassium ratio in the nutritional program if maximum pound solids are to be produced. A fertilizer formulation of 1:1.6 N to K₂O meets these criteria for later applications prior to maturity.

Two Methods to Increase Set

Supplying projected calcium needs can be achieved utilizing one of the following: Apply 150 pounds of Calcinit™ per acre 3-4 weeks prior to projected flowering **or for best results** apply 10 gallons of CN-9® Solution two to three weeks prior to projected flowering followed by two additional applications spaced two weeks apart. The specific amounts are determined by projected crop load potential. This practice has seen a significant increase of calcium content in fruit, particularly in upper portions of the fruit. **Growers following this program have achieved returns of 7 times the cost of CN-9® Solution.**

Other Benefits Received

In addition to setting more fruit, earlier fruit set is also a benefit. Early set removes the potential sites (flower petals) for Post Bloom Fruit Drop since the petals drop once the flower is fertilized. Early fruit set yields larger fruit with more juice and higher pounds solids at harvest.

Increased peel calcium fortifies the fruit against pests and damage and water loss during transit to processing sites.

A fertilizer program utilizing Calcinit™ and Potassium Nitrate maximizes N, K and Ca uptake during this critical time of fruit development. Used throughout the year as nitrogen, potassium and calcium sources they promote maximum tree health, increased production and profitability and optimal fruit quality.

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