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EXTENSION

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## Your Florida Dooryard Citrus Guide - Bearing Trees (Years 3 to 5+)<sup>1</sup>

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After about 2 to 5 years young trees begin to bear fruit. The quality of fruit produced on young trees is usually poor compared with that produced by the same tree when mature, so don't get discouraged.

The goal of the fertilizer program for young, bearing trees is to continue to stimulate vigorous growth of leaves and branches that may compete with early fruit production. After the tree has become established, the goal will be to replace nutrients removed with the fruit and to provide enough nutrients to sustain continued tree growth.

Many different fertilizer formulations are available for use on dooryard citrus trees. In general, the numbers on a fertilizer bag refer to the percent of nitrogen, phosphorus, as  $P_2O_5$ , and potassium, as  $K_2O$ , plus other secondary and micronutrients.

For example, if the numbers 8-8-8 were listed on a fertilizer bag, it would contain 8% nitrogen (N), 8% phosphoric acid ( $P_2O_5$ ), and 8% potassium expressed as potash or potassium oxide ( $K_2O$ ). Other nutrients like magnesium (Mg), copper (Cu) and boron (B) may also be listed. If there are any numbers after the first three numbers, read the information on the

fertilizer bag to determine the percentage of other nutrients that are included.

This type of fertilizer would be ideal for a nonbearing young citrus tree. Higher analysis, mixed formulations such a 12-0-12 or 15-0-14 are used on mature trees. Controlled-release fertilizers that slowly release nutrients over a 6- to 9-month period can also be used.

Composted or processed animal manure may also be used. However, nutrients from these materials become available for plant use more slowly than from synthetic, granular, or liquid fertilizers. Composted cow manure usually has less than 1% nitrogen with composted chicken manure ranging from 2 to 3% nitrogen, with both materials containing other nutrients.

For example, to obtain the suggested 0.15 lbs. N using cow manure containing 0.5% nitrogen, you would have to apply 30 lbs. of cow manure (30 lbs. cow manure x .005 or 0.5% N = 0.15 lbs. N). To obtain the suggested 0.15 lbs. N using chicken manure containing 3% nitrogen, you would have to apply 5 lbs of chicken manure (5 lbs. chicken manure

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x .03 or 3% N = 0.15 lbs. N). Adding composted manure at these suggested fertilizer rates will supply needed nutrients over time but will not increase soil organic matter because of rapid organic matter decomposition under Florida conditions of high temperatures and rainfall.

The amount of fertilizer applied depends on the analysis of the fertilizer you are using.

*Question: How much 6-6-6 fertilizer does it take to provide 0.15 lbs of nitrogen applied in 6 applications during year one? Solution: Divide lbs nitrogen by % nitrogen. Result:  $0.15/.06=2.5$  lbs of a 6-6-6 fertilizer. Apply .4 lb in each of 6 applications.*

Table 1 provides a range of fertilizer rates (amounts per tree per year) you can use.

Fertilizer nutrients leaching into groundwater are becoming a major problem in Florida. Dooryard enthusiasts, like commercial growers, can help maintain water quality by following recommended fertilization practices.

Notice in Table 1 how the amount of fertilizer needed decreases when the percent nitrogen increases. No amounts are given for years 1-3 for the 10-10-10 fertilizer because only lower analysis fertilizers should be used during this time to avoid damaging young citrus trees with fertilizer burn. If controlled-release fertilizers are used, fertilizers can be applied once every 6-9 months, according to recommendations on the fertilizer bag.

For young trees, apply fertilizer uniformly in a 3-ft. diameter circle around the tree. As the tree becomes older, the area fertilized should be enlarged as the root system expands. As a rule of thumb, fertilize an area twice the diameter of the tree canopy. Care should be taken to avoid root or trunk damage by uneven placement or mounding the fertilizer against the trunk.

For mature bearing trees on well-drained soils, three applications of fertilizer per year are sufficient, one application in the fall or winter followed by a second application in the late spring or early summer and a third in late summer.

Avoid or minimize applications of soluble nitrogen fertilizers during the summer rainy period to reduce nitrogen leaching and potential groundwater contamination. For trees planted on coarse, shallow soils and where the root system is limited, more frequent applications (3-4 times per year) will result in better utilization of nutrients and reduce leaching. Apply nutritional sprays when deficiency symptoms appear.

To summarize these fertilizer recommendations: apply up to 0.3, 0.6 and 0.9 lbs. nitrogen per tree during years 1, 2, and 3 respectively. Thereafter, increase the amount of nitrogen applied according to tree growth, up to but not more than 1.5 lbs. nitrogen per tree per year. Fertilization rates can also be reduced if your citrus tree is planted in a landscape where turf and shrubs are well fertilized.

## Soil pH

Soil pH is an important factor in the nutritional program, as it affects the availability of soil nutrients. The pH of most native Florida soils ranges from 4.0 to 5.0. Soil pH units are exponential; i.e., for each whole-unit change in pH there is a tenfold increase or decrease in soil alkalinity or acidity. Macronutrients like nitrogen, phosphorus, potassium, calcium, magnesium and sulfur are more available to the plant in the pH range of 6.0 to 7.0. Micronutrients like iron, manganese, boron, zinc, copper, and molybdenum are more available when the soil is more acidic.

Adding lime to the soil usually increases soil pH and calcium levels. Two common sources of lime are dolomite and calcitic limestone. Dolomite is the preferred material because it supplies both calcium and magnesium in addition to adjusting soil pH. For best results, apply lime to the soil surface, and then incorporate it well into the soil.

**Table 1.** Suggested fertilization schedule for citrus trees from planting to maturity.

Tree Age*	Lbs Nitrogen/tree/yr range	Lbs Nitrogen/tree/yr range** Fertilizer analysis			Applications/year
		6-6-6	8-8-8	10-10-10	
1	0.15-0.30	2.0-5.0	1.8-3.8		6
2	0.30-0.60	5.0-10.0	3.8-7.5		5
3	0.45-0.90	7.5-15.0	5.6-11.3		4
4	0.80-1.0	13.5-17.0	10.0-12.5	8.0-10.0	3
5+	1.1-1.4	18.0-23.5	13.8-17.5	11.0-14.0	3

\*Tree age = years planted, with year 1 beginning right after planting.  
\*\*Do not use a fertilizer with higher than an 8-8-8 analysis on young trees during years 1-3.  
Divide "Lbs Fertilizer/tree/yr" by "Applications/year" to determine how many lbs fertilizer to apply for each application.