

FACT SHEET

TT: Ag Ext 98:01

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USING FERTILIZERS & MANURE IN CITRUS

1. What Are Fertilizers?

Fertilizers are soil amendments used to promote plant growth. They contain several elements which are necessary for plant growth. These elements are divided into three categories based on the amounts required by the plant, namely, major, minor and trace elements. These elements comprise the nutrients required by the plants.

2. Nutrients Required

Plants need large amounts of primary elements. These are: **Carbon (C), Hydrogen (H), Oxygen (O), Nitrogen (N), Phosphorus (P), Potassium (K)**. C, H and O are provided by the air and water. N, P and K are provided by soil or through the use of fertilizer and/or manure. Secondary elements (Calcium, Magnesium and Sulphur) are required in lesser amounts. Plants also need very small amounts of trace elements. These are **Copper, Zinc, Manganese, Boron, Chlorine, Molybdenum and Iron**.

3. Why Are Fertilizers Used?

Fertilizers are used:

- To provide the correct “balance” of nutrients to plants if needed
- To correct nutrient deficiencies in the plant
- To replace lost nutrients from the soil.

Nutrient Deficiency:

Nutrient deficiencies may occur in the plant when:

- There are insufficient nutrients in the soil
- Nutrients are lost from the soil
- Nutrients are unavailable to plants because they may be “locked up” in the soil due to the soil being very acidic.

Citrus requires a pH of 5.5 - 6.5 to allow nutrients to be taken up by the plant.

The most important elements which may become deficient in soil are Nitrogen, Phosphorus, Potassium and in some cases, Magnesium, Manganese and Copper.

4. When Should Fertilizers Be Used?

Knowing the nutrient status and pH of the soil in the orchard can enable a farmer to develop a management program that would help optimize the fertilizer applications. You can get soil and/or plant tissue analyses to determine:

- Whether the plant is lacking any of the essential elements
- How much of the deficient element is required.

In practice, the application rate of fertilizers for citrus trees varies according to the age of the tree, fruit load, soil fertility and the nutrient status of the tree. Ensure that trees are watered before and after fertilizers are added.



Figure 1: Healthy Citrus Crop

5. Too Much Fertilizer Is Harmful

Too many fertilizer applications may reduce yield, damage the tree and impact on fruit quality. Excessive use of fertilizers may cause the fruits to be smaller than usual, have a thicker peel, lower sugar content and may be late in turning colour. The overuse of fertilizers may also result in excessive amounts remaining as concentrates and this can pollute the soil and irrigation water.

6. Fertilizer Recommendations For Non-bearing Trees

The following can be used as a guide for fertilizing non-bearing citrus trees in the absence of a soil or leaf test.

Apply a granular compound fertilizer, e.g. 20:10:10 or any other NPK mixture with a 2:1:1 ratio. The following quantities are recommended for the 20:10:10 formulation.

Age of Tree	Quantity of Each Application per Plant	No. of Applications May – December	No. of Applications January – April
1 st Year	57g (2 oz)	3	2
2 nd Year	114g (4 oz)	3	1
3 rd Year	227g (1/2 lb)	2	1

Apply dolomitic limestone (this contains calcium and magnesium) at a rate of ¼ lb (114g) per tree, twice per year. Also, add ¼ lb (114g) of Epsom Salts (magnesium sulphate) per tree, once per year.

Trees begin to bear after the third year.

7. Fertilizer Recommendations For Full Bearing Trees

For a bearing tree, the amount of fertilizer required is based on the production of the tree. Use a complete granular fertilizer such as 12:12:17+2 at a rate of 1 lb (454 g) per tree, twice per year. Continue applying dolomitic limestone at a rate of ¼ lb (114g) per tree, once per year and Epsom Salts at a rate of ¼ lb (114g) per tree, once per year.

8. Trace Elements

Trace elements are easily absorbed by the leaves and can be applied as foliar sprays (on the leaves) from the third year onwards. Follow the manufacturer's recommendation on the label.

9. Animal Manure

In addition to the granular fertilizers, using animal manure can be beneficial. It is rich in nitrogen and also improves the texture of the soil.

N.B. Apply animal manure only after it is well weathered or “cured” (the “curing” may take approximately 6 months).

Use ¼ to ½ a bag of manure for trees under five years old.

For full-bearing trees, use one bag per tree for oranges and limes; two bags for grapefruits.

10. Where and How to apply Fertilizers

On flat land, apply granular fertilizers around the base of the tree using the canopy “drip circle” as a guide.

On slopes, apply fertilizers only on the upper side of the slope using that part of the “drip circle” as a guide. Using fertilizers in a timely manner would ultimately increase production and reduce cost.

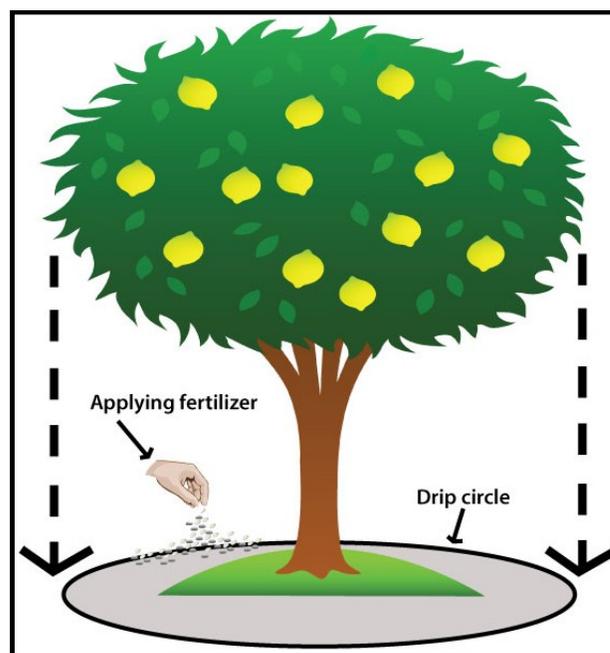


Figure 2: Fertilizer application along Drip Circle of Tree

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