

# Soil Nutrient Analysis Laboratory



Soil Nutrient Analysis Laboratory; 6 Sherman Place, Unit 5102, Storrs, CT 06269-5102

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## Suggested Fertilizer Practices for Tree Fruits

Tree fruits are attractive as well as tasty additions to the home landscape. There are numerous varieties of apples, pears and stone fruits to choose from that are well suited to our climate conditions. Tree fruits are also available on dwarf and semi-dwarf rootstocks where planting space is limited.

For best production, tree fruits require a minimum of six hours of direct sunlight each day. Trees exposed to early morning sun may have less disease problems as the nighttime dew that covers the leaves will evaporate quicker. Avoid planting tree fruits in low lying areas or cold air pockets. The blossoms may be damaged by late frosts.

Ideal soils for tree fruits are deep, well-drained sandy loams, although most tree fruits can tolerate coarser or heavier soils. Good drainage is imperative, however, or root growth will be impaired and roots will be unable to support the weight of bearing trees. Tree fruits prefer soils with a pH ranging from 6.0 to 6.5, and containing moderate levels of organic matter.

Typically, a purchased fruit tree consists of two genetically different individuals that have been grafted together. The 'scion' is the aboveground part that produces the type of fruit desired. The 'rootstock' is the underground portion and the variety of rootstock used determines both the tree's ultimate size and how long it will take to bear fruit. The point where the two parts are connected is referred to as the graft union. When planting tree fruits the graft union should be 2 to 4 inches above ground. If the graft union is placed at or below ground level, the scion wood may root and trees on dwarf or semi-dwarf root stocks would grow to full size.

### Six Months To One Year Before Planting

Have the soil tested. Follow the soil test recommendations to adjust the pH into the desired range for tree fruits. Dolomitic limestone, that contains both calcium and magnesium, is the most readily available liming material and is most commonly used to raise the soil pH. If soil test magnesium levels are above optimum, however, a calcitic limestone should be selected.

It is important that calcium levels be maintained in the desired range as physiological problems like corking and bitter pit of apples may result from inadequate calcium supplies. Adequate calcium in the soil also improves the cold hardiness of peach trees.

Depending on environmental conditions, it may take 9 months or more for a substantial pH change to occur from applications of limestone. If at all possible, work the limestone into the top 8 to 12 inches of soil in areas where tree fruits are to be planted. Retest the soil before planting if a large adjustment in soil pH was necessary.

### Year Of Planting

Consider having the soil tested if you have not already done so. If limestone is recommended at this time, it is most practical to mix it with the soil that is to be placed around the roots at planting time. For every 4 pounds of limestone per 100 sq. ft. recommended, apply 1 tablespoon of limestone per cubic foot of soil. For example, if the recommendation on the computer sheet is 12 pounds of limestone per 100 sq. ft., add 3 tablespoons of limestone to each cubic foot of soil placed around tree roots.

If soil phosphorus levels are below optimum, add superphosphate (0-20-0) at the rate of 1 to 2 oz. ( $\frac{1}{8}$  to  $\frac{1}{4}$  cup) OR triple superphosphate (0-46-0) at the rate of  $\frac{1}{2}$  to 1 oz. (1 to 2 tbsp.) OR bonemeal (1-11-0) at the rate of 2 to 4 oz. ( $\frac{1}{4}$  to  $\frac{1}{2}$  cup) per cubic foot of soil used to back fill the planting hole. Mix any limestone or phosphorus thoroughly with the soil that is to be placed around the roots when planting.

Without a soil test, after the tree is planted, apply  $\frac{1}{4}$  cup of 10-10-10 or the equivalent from other sources around the plant. Spread the material evenly in an area 4 feet in diameter. Repeat the application in 4 to 6 weeks, but not later than the middle of June.

### Second And Third Year

Without a soil test, apply, per plant, 1 to  $1\frac{1}{4}$  cup 10-10-10, or the equivalent from other sources in the second year, and  $1\frac{1}{2}$  to 2 cups in the third year. Split the application applying half in mid-April and half 4 to 6 weeks later. Spread evenly in an area 5 to 6 feet in diameter.

### Fourth Year And Older

If plants have been fertilize regularly in previous years, it may not be necessary to add additional phosphorus to the soil unless a soil test indicates it is below optimum. Nitrogen and potassium, however, are generally added on a yearly basis. Any available nitrogen is used up quickly by plants, fixed by microorganisms, volatilized or leached from the soil, and therefore needs to be added each year. Adequate potassium levels have been linked to improved cold hardiness.

Amounts of nitrogen needed annually for young trees can be based on the tree's spread (canopy diameter) as shown in Table 1. For pears, reduce of the amount by 25 to 50 percent to decrease the incidence of fire blight. Apply the fertilizer within the limits of branch spread about mid-April. On very sandy soils, a split application may be more effective with one half of the fertilizer applied in early April and the rest applied 4 to 6 weeks later. When trees have grown to desired mature size, a 50 to 75 percent

reduction in amounts applied may be needed to avoid excessive vegetative growth. Table 1 values are for trees that have not grown as large as desired. In general, mature apple trees should put on between 8 and 12 inches of growth each year, pears about 8 to 15 inches and stone fruits like peaches between 12 to 18 inches. If soil test potassium is below optimum, use a 10-10-10.

**Table 1. Annual Fertilizer Rates for Vigorous Growth of Tree Fruits\***

Tree Spread (ft. diameter)	Amount of 10-6-4 or 10-10-10 or equivalent to supply desired amount of nitrogen/tree
8	1 lb. 3 oz.
10	1 lb. 14 oz.
12	2 lb. 11 oz.
14	3 lb. 10 oz.
15	4 lb. 3 oz.
16	4 lb. 14 oz.
18	6 lb. 1 oz.
20	7 lb. 8 oz.
22	9 lb. 1 oz.
24	10 lb. 13 oz.
26	12 lb. 11 oz.
28	14 lb. 11 oz.
30	16 lb. 14 oz.

Note: 8 oz. = ½ lb. = 1 cup of 10-6-4.

\*For pears, reduce rates by 25 to 50 percent. For dwarf trees, reduce rates by 50 percent. For mature trees, reduce rates by 50 to 75 percent.

For bearing apple and pear trees, a boron fertilizer can be applied to the ground every three years. Apply Borax (10 to 12% boron) as shown in Table 2. Do not exceed the indicated amounts as plant injury may result. Apply in a circle around the tree about 4 to 15 feet out from the trunk depending on the tree's size. For closely planted trees, a band application on two sides of the row is satisfactory. Plants fertilized with natural organic sources rarely need additional boron.

**Table 2. Rates of Borax to Apply Once Every Three Years.**

Tree Spread (ft. diameter)	Ounces* borax per tree (10-12% boron)
6	0.4
8	0.7
10	1.1
12	1.6
14	2.2
16	2.8
18	3.6
20	4.4
22	5.3
24	6.3
26	7.5
28	8.6
30	10.0

\*One ounce of granulated borax equals about 3 tablespoons.

**Note:**

10 lbs of 10-10-10 will supply plants with 1 lb. of Nitrogen (N), 1 lb. of Phosphate (P<sub>2</sub>O<sub>5</sub>) and 1 lb. of Potash (K<sub>2</sub>O) per 1000 sq. ft. (Phosphate is a form of phosphorus; Potash is a form of potassium)

10 lbs of 10-6-4 will supply plants with 1 lb. of Nitrogen (N), about ½ lb. of Phosphate (P<sub>2</sub>O<sub>5</sub>) and about ½ lb. of Potash (K<sub>2</sub>O) per 1000 sq. ft.

**To Supply Nutrients Using Natural/Organic Sources Use The Following Equivalents:**

1 lb. of Nitrogen can be supplied by 8.3 lbs. of bloodmeal (12-0-0) or 11 lbs. of corn gluten (9-0-0).

1 lb. of Phosphate can be supplied by 6.75 lbs. of bonemeal (3-15-0) or 33.5 lbs. of rock phosphate (0-3-0)

1 lb. of Potash can be supplied by 25 lbs. of kelp meal (1-0-4) or 4.5 lbs. of sul-po-mag\* (0-0-22)

Keep in mind that the NPK analysis of natural organic products may vary by producer and adjust your application rates accordingly.

\*Note: May need to be special or mail ordered.

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