

# FACT SHEET

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## FERTILIZING WOODY ORNAMENTALS

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Attractive trees and shrubs are important components of all well-landscaped properties. Planned maintenance and care are essential for keeping them healthy and vigorous. An adequate fertilization program is an important requirement of any good woody plant maintenance program.

Where a good lawn maintenance program is followed, supplemental fertilizer seldom is needed for trees and other woody plants within the lawn area. Occasionally additional fertilizer is needed in areas where the tree's root growth is restricted by streets, curbs or other structural features. Shrubs and vines frequently serve as screens or borders for lawn areas within the landscape. Since areas around shrubs are usually not as accessible as lawn areas, they frequently are forgotten or neglected in the normal lawn fertilization program.

Fertilizer cannot solve problems from improper planting techniques, poor soil drainage, excessive soil compaction and incorrect watering practices. Difficulties caused by species unsuited for a given environment are not overcome with fertilizers. Select trees and shrubs suited to the local climate and soil.

Signs indicating low fertility include lack of terminal growth, pale green or yellow leaves, mottled leaves, dead branches, stunted leaves and early loss of leaves.

General tree vigor is determined by comparing the length of twig growth during the past 3 to 4 years. Generally speaking young trees should have at least 9 to 12 inches of terminal growth per year. Large mature trees will usually average from 6 to 9 inches. This varies from season to season and variety to variety. Shrub vigor also can be determined in the same manner. Growth is dependent upon the shrub species and the size being examined.

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### CHECKING TREE GROWTH

To check tree growth for the current season, measure the twig from the tip to the first ring of bud scale scars. The previous year's growth is the distance between the first ring of scars and the next ring of bud scale scars. By comparing the current season's growth with that of several previous seasons, growth rate can be determined.

### COMPUTE FERTILIZER NEEDS

Tree fertilizer recommendations frequently are based on the trunk diameter with no allowance made for a root zone that may be confined to a limited area. These recommendations can result in overfertilization and tree damage.

Base fertilizer needs on the number of square feet in the growing area or the branch spread. When a root system is restricted by streets, paved areas or curbs, requirements are based on the area in which roots are confined.

Preferably, base fertilizer recommendations on a soil test; however, in the absence of such tests the general lawn fertilizer recommendation of 6 pounds of actual nitrogen per 1,000 square feet per year is satisfactory for tree and shrub care. Apply this in several applications. Again, referring to the lawn care program, an application of complete fertilizer at the rate of 2 pounds of actual nitrogen per 1,000 square feet is recommended in the spring just before new growth starts.

Make a similar application in the fall about the time of the average date of the first killing frost. Apply the remaining 2 pounds of nitrogen in the form of ammonium nitrate, ammonium sulfate or other source of readily available nitrogen at the rate of  $\frac{1}{2}$  to  $\frac{3}{4}$  pound of nitrogen per 1,000 square feet at 6 to 8-week intervals. (See Table 1).

Table 1. The amount of nitrogen fertilizers needed to supply from 1/2 to 2 lbs. of actual nitrogen per 1,000 square feet.

| Material                  | Approximate pounds of fertilizer needed to supply |         |           |           |
|---------------------------|---|---------|-----------|-----------|
|                           | 2 lb. N   | 1 lb. N | 3/4 lb. N | 1/2 lb. N |
| Urea (45-0-0)             | 4   | 2       | 1 1/2     | 1         |
| Ammonium nitrate (33-0-0) | 6   | 3       | 2 1/4     | 1 1/2     |
| Ammonium sulfate (21-0-0) | 10  | 5       | 3 3/4     | 2 1/2     |
| 10-10-10                  | 20  | 10      | 7 1/2     | 5         |
| 12-12-12                  | 16  | 8       | 6         | 4         |
| 10-20-10                  | 20  | 10      | 7 1/2     | 5         |

Make no fertilizer application from July 30 until late fall about the time of the average date of the first killing frost. Late summer fertilizing can stimulate an excessive amount of new growth making plants more susceptible to winter injury. In South Texas where freeze damage is slight, late summer applications of fertilizer are beneficial and provide needed nutrients for late fall and winter growth.

When purchasing a complete fertilizer, select one containing all three major plant nutrients — nitrogen, phosphorus and potassium. The analysis of a fertilizer is shown on the bag or container and consists of three numbers, for example, 12-12-12. The first number indicates the percentage of nitrogen (N); the second gives the percentage of phosphorus as phosphoric acid ( $P_2O_5$ ); and the third is the percentage of potassium as potash ( $K_2O$ ). A 50-pound bag of a 12-12-12 fertilizer will contain 6 pounds of N, 6 pounds of  $P_2O_5$  and 6 pounds of  $K_2O$ .

Tree growth is limited by a nitrogen deficiency more often than by a lack of the other two major elements. For this reason it is recommended that a fertilizer with a 2-1-1 or 3-1-1 ratio be used for trees. Fertilizers with a 2-1-1 or similar ratio which usually are available include 10-8-6 and 12-6-6. If the desired ratio is unavailable, a 3-1-1 ratio fertilizer can be approximated by mixing 12 ounces of ammonium nitrate (33-0-0) to each pound of a 12-12-12 fertilizer used. The same type fertilizer can be used on shrubs and vines; however, fertilizer recommended for lawn use in the area also is adequate for these plants.

### STAKE OFF AREA

To figure the amount of nitrogen-containing fertilizer needed for woody plants, stake off a square or rectangular area that includes the entire branch spread of the trees and shrubs in an area.

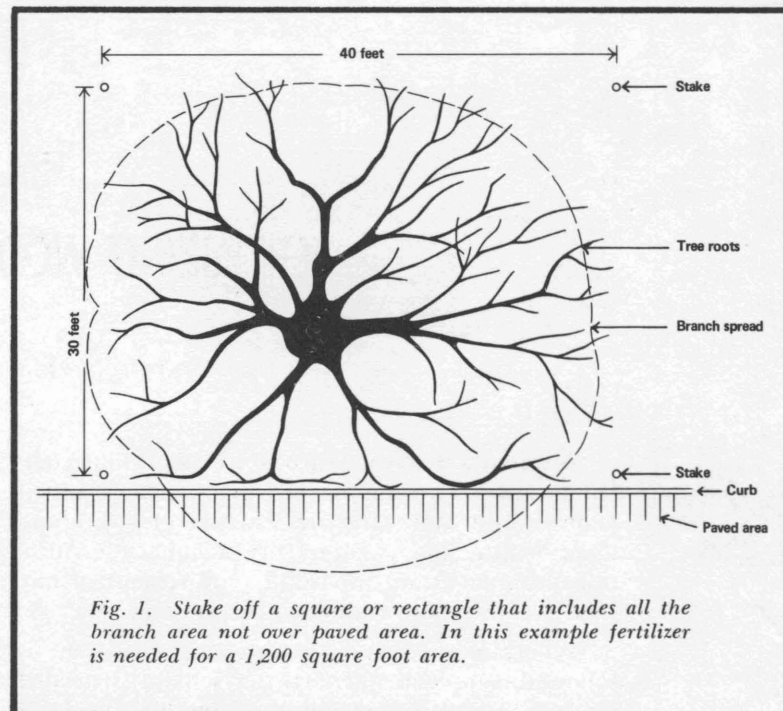


Fig. 1. Stake off a square or rectangle that includes all the branch area not over paved area. In this example fertilizer is needed for a 1,200 square foot area.

If roots are restricted by pavement, curb or building, subtract the restricted area from the total area computed. (See figure 1).

### APPLICATION METHOD

Research has shown that when fertilizing trees and shrubs, surface applications of nitrogen-containing fertilizers are just as efficient as the old method of punching holes. Fertilizer may be distributed by hand or with a fertilizer distributor. Distribute it evenly and avoid skips and overlapping. Skips and overlaps result in light and dark streaks in the grass growing beneath the trees. To obtain even distribution, divide the fertilizer into two equal lots and apply one-half lengthwise over the area and the remainder crosswise over the area.

Water the area thoroughly after fertilizing, soaking the soil to a depth of at least 6 inches. If soil tests indicate a need for either phosphorus or potassium, place needed fertilizer in holes rather than on the surface because these materials penetrate too slowly to reach tree roots in adequate amounts when surface applications are made. Phosphorus or potassium applications are needed only every 3 to 5 years. In some areas of Texas, the soil potassium-content is sufficient to adequately supply the needs of woody plants. Check with your county Extension office before applying additional potassium. See Table 2 for the amount

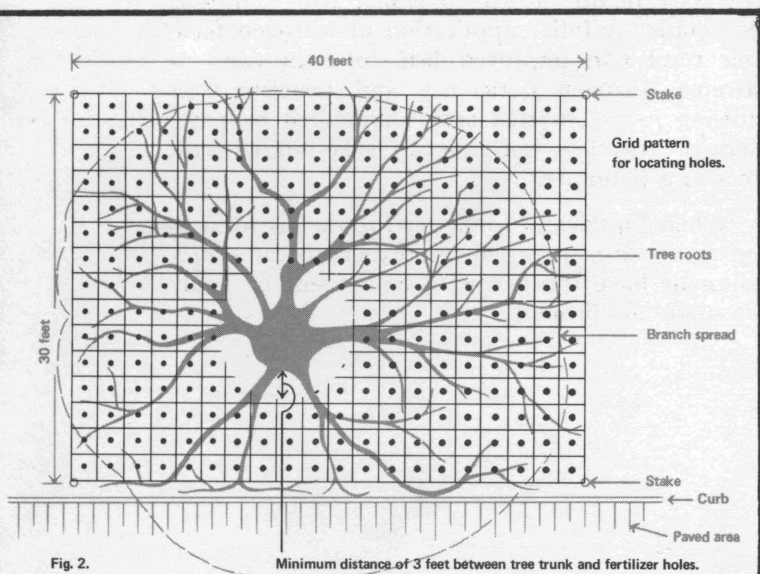


Fig. 2. Minimum distance of 3 feet between tree trunk and fertilizer holes.

Fig. 2. Drill or punch holes every 2 feet within the area to be fertilized. String or twine may be used to mark off the area; then place a hole in the center of each square.

of phosphorous and potassium-containing materials to use per 1,000 square feet of area.

Table 2. Amounts of phosphorus and potassium fertilizer materials needed to supply 3.6 pounds  $P_2O_5$  per 1,000 square feet and 6 pounds of potash ( $K_2O$ ) per 1,000 square feet.

| Material                        | Quantity needed per 1,000 sq. ft. | Amount per hole based on 250 holes per 1,000 sq. ft. |
|---------------------------------|-----------------------------------|--|
| Phosphorus (P)                  |                                   |  |
| Superphosphate (0-20-0)         | 18 lb.                            | 2 tbsp.  |
| Treble superphosphate (0-46-0)  | 8 lb.                             | 1 tbsp.  |
| Potassium                       |                                   |  |
| Muriate of potash (0-0-60)      | 10 lb.                            | 1 tbsp.  |
| Nitrogen, phosphorus, potassium |                                   |  |
| 10-20-10                        | 18 lb.                            | ¼ cup  |
| 12-12-12                        | 30 lb.                            | ½ cup  |

Apply recommended amounts of fertilizer materials in holes 8 to 15 inches deep, depending on the soil depth. If there is an impervious layer of clay below the surface, there is little need to go below it. An exception is where a shallow impervious layer or hardpan can be penetrated. Space holes 2 feet apart throughout the area to be treated. By using 2-foot spacings there will be approximately 250 holes per 1,000 square feet. Do not place holes within 3 feet of the tree trunk. Figure 2 illustrates the simplest method of arranging the holes. It is seldom practical to place the fertilizer beneath the surface when fertilizing shrubs because of their close spacing.

## FERTILIZING EVERGREENS IN ALKALINE SOILS

Research indicates that evergreens, in general, require less fertilizer than deciduous plants. Most broad-leaved evergreens (magnolia, loquat, etc.) prefer an acid soil. To maintain these conditions, use acid-type fertilizers and avoid materials including wood ashes, lime, fresh manure or bonemeal.

Organic fertilizers often are preferred for use around broad-leaved evergreens. Nutrients in these materials are released to the plant slowly and do not produce excessive growth. There is less danger of damage from overfertilization. Apply fertilizers such as cottonseed or soybean meal at 5 to 6 pounds per 100 square feet of planted area. Another organic-type fertilizer can be prepared using one part by weight of sulfate of potash or muriate of potash, two parts by weight of 20 percent superphosphate and five parts by weight of cottonseed meal. Thoroughly mix the materials and apply at the rate of 2 to 5 pounds per 100 square feet of area under the trees or shrubs. Apply fertilizer mix to the surface, in holes as described previously or work into the top few inches of soil. One application every other year usually is adequate.

In general, the procedure previously outlined for fertilizing other woody plants also is adequate for large narrow-leaved evergreen trees. Reduce by one-third on narrow-leaved evergreen shrubs and small trees and apply in early spring before growth starts.

## ALTERNATIVE METHODS OF APPLYING FERTILIZER

Heavy duty power drills with 1 or 1½-inch soil augers may be rented from many rental agencies for drilling the holes. If the soil is moist, holes can be punched into the soil with a heavy punch bar. A hand auger also can be used to drill the holes. The last two methods involve considerable hand labor.

After the required amount of fertilizer has been placed in each hole, fill the hole with good compost or two parts sand to one part peat moss. Regardless of whether the fertilizer is applied to the surface or placed in holes, thoroughly water the area to a depth of 6 to 8 inches immediately after fertilizing.

Liquid fertilizer injection is done with an injector needle or lance that is forced through the soil instead of making larger holes for dry application. Some types utilize water pressure to create the opening. Advantages of these methods over dry applications include faster uptake of the fertilizer and time saving. Disadvantages include the

need for special equipment, difficulty in probing rocky soils and the fact that organic matter or sand cannot be added at the same time. Use of sand and/or organic matter is desirable to overcome soil compaction in parks or other high traffic areas. If soil is compacted heavily, fertilizer applications seldom will be effective unless the soil is aerated.

Foliar fertilization with iron compounds, such as ferrous sulfate or chelated iron, is especially valuable in correcting lime-induced iron deficiency

in woody plants. Refer to L-435, *Iron Chlorosis* for details. A foliar application of nitrogen fertilizer results in improved leaf color in cases of extreme nitrogen deficiency and benefits trees growing in a restricted area surrounded by pavement or gravel as is frequently encountered with trees in a patio area.

When liquid and foliar fertilization is needed, contract with a qualified tree expert, because professionals have the necessary equipment to apply the materials properly.



...of change from overfertilization. Apply fertilizer ... at contained in soybean meal at 5 to 6 ... 100 square feet of planted area. ... other organic type fertilizers can be prepared using ... and parts by weight of sulfate of potash or sulfate ... of potash, two parts by weight of 30 percent super ... phosphate and five parts by weight of compound ... meal. Thoroughly mix the materials and apply ... the rate of 2 to 3 pounds per 100 square feet of ... area under the trees in spring. Apply fertilizer ... mix to the surface in holes as described previously ... or soil into the top few inches of soil. One appli ... water every other year usually is adequate. V

In general, the procedure previously outlined for fertilizing other woody plants also is adequate for these narrow-leaved evergreen trees. Reduce the amount of fertilizer applied to 1/2 to 1/3 of that recommended for broad-leaved evergreen plants and apply in early spring before growth starts. Do not fertilize in winter. Water or mulch in winter as suggested in L-435.

#### ALTERNATIVE METHODS OF APPLYING FERTILIZER

Heavy duty power drills with 1 or 1/4-inch soil augers have been rented from many rental agencies for drilling the holes. If the soil is moist, irrigation can be used to moisten the soil with a heavy pump sprayer. A hand water can can be used to drill the holes. The two methods involve considerable hand labor.

After the required amount of fertilizer has been placed in each hole, fill the hole with good compost or two parts sand to one part peat moss. The amount of water the fertilizer is applied in the holes or placed in holes throughout with the soil to a depth of 6 to 8 inches immediately after fertilizing.

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