

Fertilizing Shade and Ornamental Trees

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Some trees do not need fertilizing. Many grow normally and successfully to their mature size and remain vigorous and healthy with no special need for fertilizer. Take a look at your tree.

Has its growth been acceptable during previous years, making a foot or so of new shoot growth? Has its foliage been normal in color, size, and amount? If so, your tree is in satisfactory condition. But if growth is less than expected or if foliage is small, sparse, or of poor color, perhaps the tree needs some fertilizer.

Fertilizers commonly are used to provide a growth stimulus for young trees or to help provide the raw materials for an older tree to put on a new flush of growth. Mineral elements enhance the foliage color, and in some cases they increase the fruit set for the following year. Fertilizers also are used to correct element deficiencies, which usually show in the leaves.

What to use as a fertilizer

The greatest growth response on trees is obtained with nitrogen applications, but several additional elements usually are needed to provide a balanced growth. Nitrogen helps supply the stimulus for new growth, continue production of foliage, and maintain green color in the leaves. A lack of nitrogen results in small, yellow foliage on most trees.

Phosphorus and potassium have a less obvious role than nitrogen, but they're essential to the healthy growth of most trees. Neither of these elements, however, is used at the same rate as nitrogen—nor do they wash into (or out of) the root area as easily. Therefore, apply phosphorus and potassium less frequently, or use a complete fertilizer with a ratio showing less phosphorus

and potassium than nitrogen (e.g., 20-10-5). A soil analysis will indicate whether either of these elements is needed.

Minor elements are essential to plant growth, but ample amounts usually are present in soils. One or more of these elements may become deficient, however, and the tree will show specialized symptoms unique to the element in short supply. Minor elements likely to become deficient in Oregon soils include iron, magnesium, and boron.

Well-rotted barnyard manure is one of the best materials for young trees, for trees being transplanted, and for trees in large open spaces where applications are possible. Don't use manure extensively, though, since its effective application is limited to open spaces where it can be worked into the soil. Commercial fertilizers can be used under most conditions to supply the same elements that barnyard manure would provide.

No general agreement exists among scientists or commercial arborists as to the *best* formula for tree fertilizer, or the amount to apply. Some claim a tree cannot be over-fertilized, while others claim that severe injury may result from too much fertilizer. But all agree that a complete fertilizer mixture containing the three critical elements—nitrogen, phosphorus, and potassium—should be used.

Most of the recent research indicates that fertilizers with approximate 3-2-1 ratios of nitrogen, phosphorus, and potassium are suitable for shade trees. Complete fertilizer mixtures such as 10-6-4 and 20-10-5 also are suitable.

When to fertilize

Many trees make their spring growth, flower, and fruit set with the mineral element reserves stored from the

previous year. Nitrogen responses usually are seen the same year the element is applied, but phosphorus and potassium responses may not be evident until the following year.

Trees may be fertilized either in late fall after all possibility of growth is past or in early spring as growth begins. Often an added push may be noticed when nitrogenous fertilizers are applied just ahead of growth flushes. Minor element deficiencies may be corrected by foliar or soil applications of the necessary element in early summer.

Amount of fertilizer

Considerable variation of opinion exists on the amount of commercial fertilizers that should be applied. Recommendations range from 1 to 8 pounds of commercial fertilizer mix for each inch in diameter of the trunk at breast height. Here's one of the more common formulas now in use:

- For trees with a trunk diameter at breast height of 6 inches or more, use $\frac{1}{2}$ pound of actual nitrogen per inch of trunk diameter.
- For smaller trees, use $\frac{1}{4}$ pound of nitrogen per inch of trunk diameter.

Figure 1, based on varying amounts of nitrogen in the mix, will help determine the amount of fertilizer to use. It's impossible to correlate volume with weight for *all* fertilizer mixtures available—but roughly speaking, 2 cups of fertilizer mix equals 1 pound.

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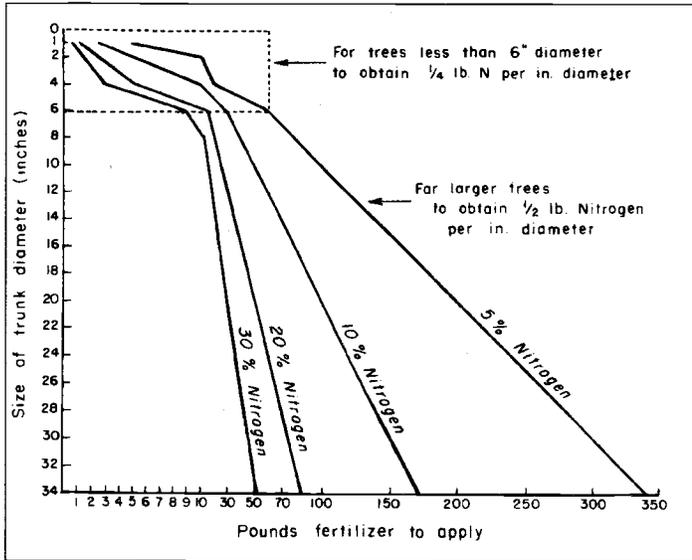


Figure 1.—Amount of fertilizer to use.

Where to fertilize

The majority of the feeder roots, which take in the nutrient elements, are in the drip line area of a shade tree. Where possible, apply fertilizer in this area (Figure 2).

Though trees differ, here's a reasonable guideline for finding the area of greatest number of feeder roots:

The radial spread of the roots in feet is equal to the diameter of the tree trunk (1 foot above the soil line) in inches. For example, a maple tree with a trunk diameter of 8 inches (1 foot above the soil line) will have most of its feeder roots in an 8-foot radius from the trunk.

Since phosphorus and potassium usually don't wash into the soil effectively, it's best to place fertilizers

containing these elements 12 to 18 inches deep to ensure their uptake by the roots. Use a punch-bar to make a number of holes in the area described above or dig fertilizers into the soil surface. Surface applications often are used up by the lawn or other ground-covering plants—and don't help the tree.

Foliar applications of nitrogen, iron, or magnesium are valuable for rapid correction of deficiencies or for use where root zones are covered by pavement. Apply these materials in soluble spray form so they can be absorbed by the plant foliage.

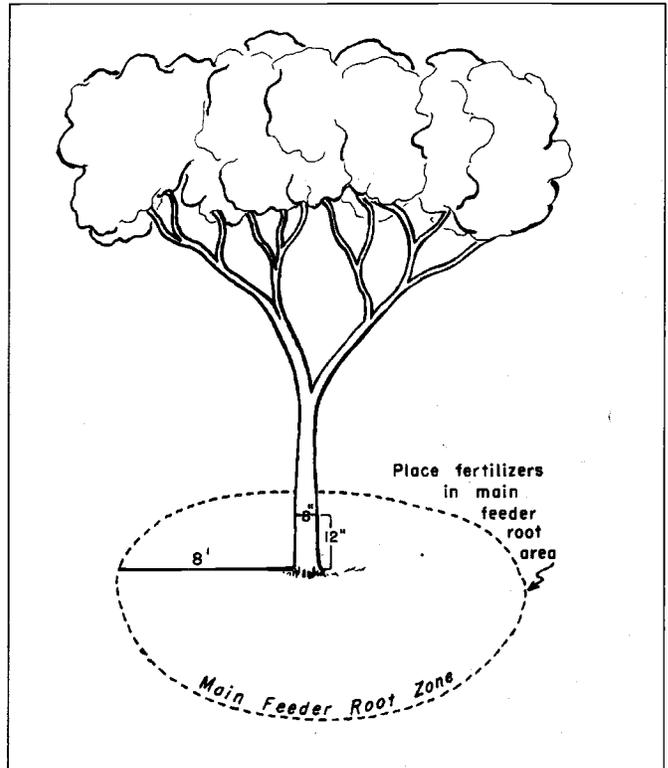


Figure 2.—Proper location of fertilizer application.

Other problems

Your trees may show symptoms that you could mistake for nutrient disorders. More often than not, causes other than nutrition contribute to poor plant appearance.

These include:

- Poor root action, caused by wet, cold, or poorly aerated soils
- Drought-associated problems
- High salt content from over-fertilizing, excessive calcium in the soil, or hard water
- Disease and insect damage, both to the roots and to the upper plant parts

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