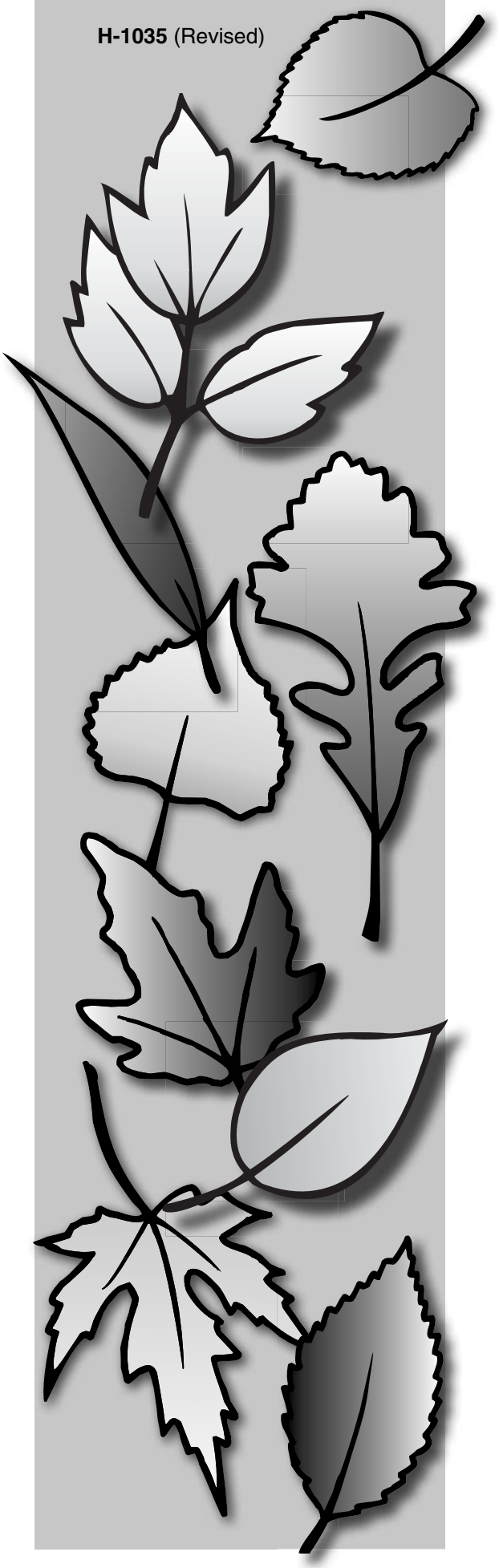
H-1035 (Revised)



Fertilizing Trees

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Fertilizer applications are used during the growing season to improve the health and appearance of trees. Most deciduous trees should be fertilized once every two to three years. Evergreens may be fertilized in the spring, but less often than deciduous trees.

Since trees have their greatest need for nutrients in the spring, fertilizer should be applied any time between leaf drop in the fall and leafing out in the spring. The health and vigor of a tree may be improved by fertilizers up to July 1. Beyond that time, new growth stimulated by the fertilizer may not have sufficient time to harden off before winter.

Trees growing in naturalized areas where little or no mowing takes place and leaves are not collected usually will not need regular fertilizing.

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Methods

Homeowners have two main methods of applying fertilizer to trees. The fertilizer can be applied directly to the soil surface or it can be applied below the soil surface via augured holes.

Spreading the fertilizer on the soil surface is the easiest and least expensive method.

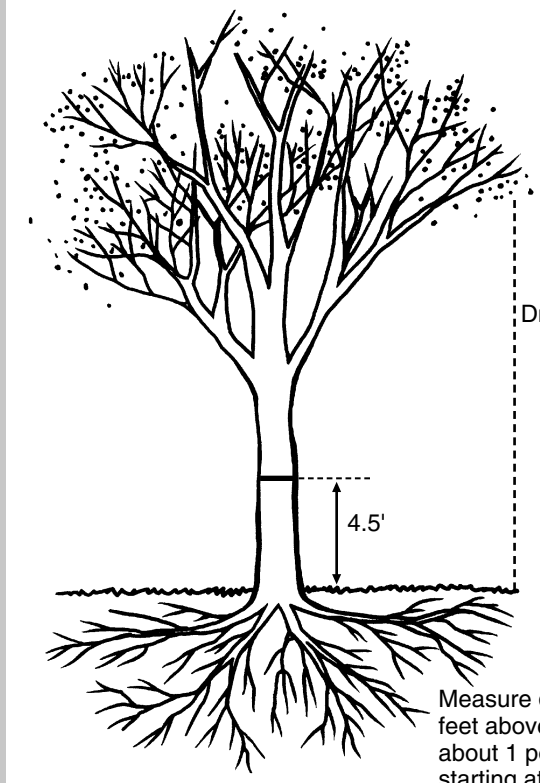
Putting fertilizer below the soil surface is more difficult but gets phosphorus and potassium into the root zone and provides the additional benefit of aeration. This can be accomplished by using a root feeder or drilling holes in the soil.

Using a hose-attached root feeder will get the material into the root zone in liquid form. Water flows past premeasured tablets in an enclosed chamber and passes through a hollow needle inserted into the soil about 8 to 12 inches deep. Follow label directions to get the calculated amount of material equally distributed to each of the insertion sites.

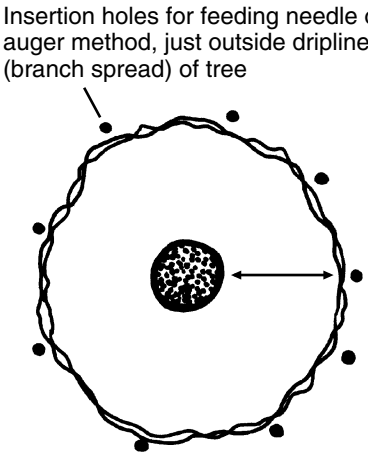
Another method of application is to make holes approximately 2 to 3 feet apart at and beyond the drip line of the tree (see sketch). Holes are drilled into the soil with a power auger 8 to 12 inches deep, slanting toward the center of the tree. The calculated amount of fertilizer for the tree then is distributed equally to the available holes, followed by a thorough watering to put the fertilizer into solution. Trees that are showing symptoms of iron chlorosis will benefit best from this method of application.

Foliar feeding of small trees is becoming more popular with homeowners. This form of fertilization is used to correct deficiencies of micronutrients such as iron or manganese. These deficiencies typically show up in soil with high pH values. Since neither of these elements stimulate excessive growth, but they do correct a chlorotic (intervienal leaf yellowing) condition, they can be applied anytime during the growing season. See Table 1 for trees tolerant to high soil pH.

Calculating Tree Fertilization Requirements



Measure diameter of trunk at 4.5 feet above ground level and apply about 1 pound of fertilizer/inch starting at dripline



Example:

$A = R^2 \times 3.14$
$A = 15' \times 15' \times 3.14$
$A = 706.5$ square feet

Apply 1 pound of actual N/1000 SF or 5 pounds of 20-10-10 fertilizer

Foliar spray also is used to help get young trees established in the landscape and help recently transplanted trees overcome the shock of being moved. As with other methods, be sure to follow label directions to avoid excessive fertilizer salt damage.

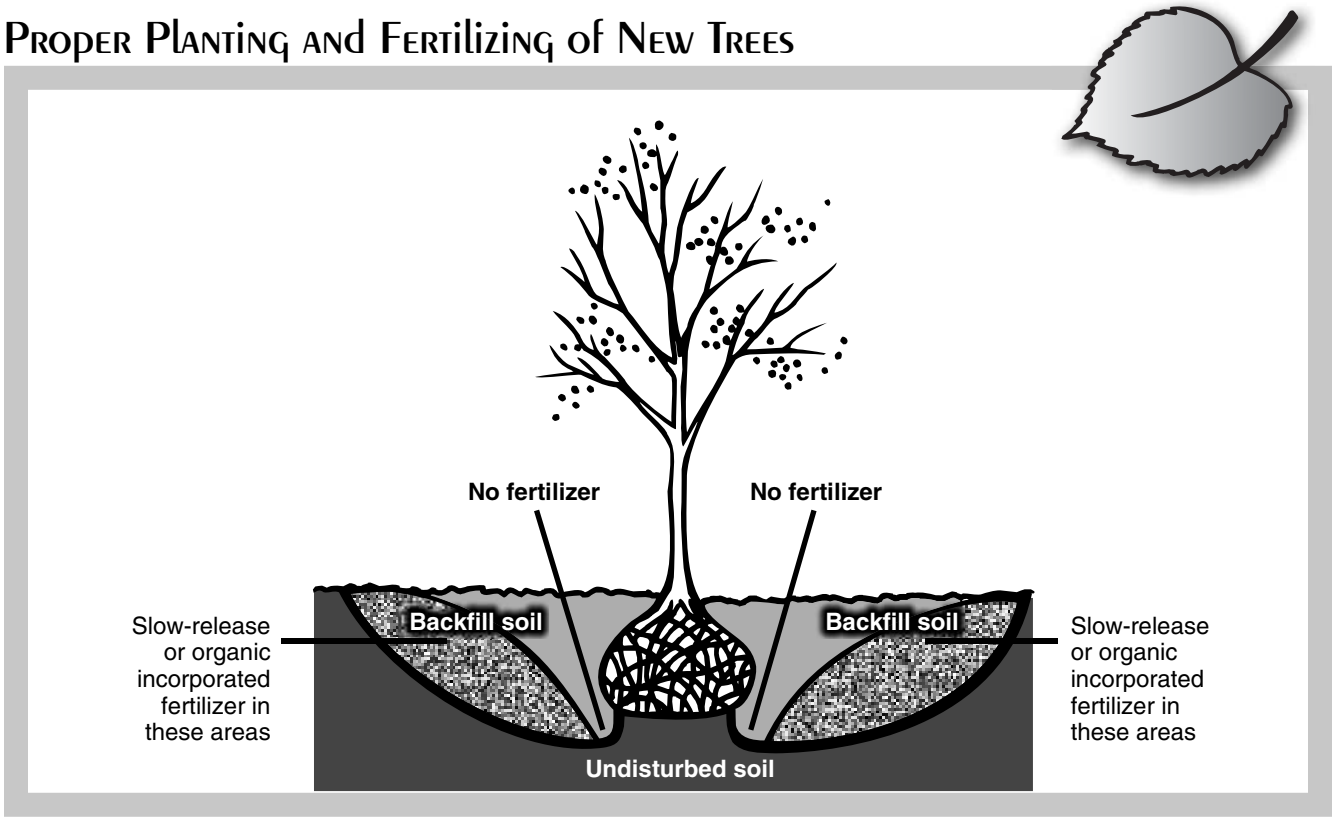
The tendency of novice homeowners is to overfertilize because estimating the amount needed in such a small volume of soil is difficult. To be safe, use slow-release and/or natural organic fertilizers mixed with the backfill soil. (see sketch: "Proper Planting and Fertilizing New Trees")

The amount of fertilizer usually is determined by the nitrogen (N) content of the material. For example, a standard recommendation is 1 pound of actual nitrogen per 1,000 square feet. This can be calculated easily by taking an example of 20-5-10 fertilizer. Multiply the weight of the fertilizer, in this case 50 pounds, by 20 percent, the amount of nitrogen (50 x 20% =10 pounds). With this knowledge, we take the amount desired, 1 pound of N, and divide it by 20 percent (1/20% = 5 pounds of 20-5-10 fertilizer needed to provide 1 pound of

Table 1. Selected woody plants better adapted to elevated soil pH (7 to 8+)

Deciduous	
Aesculus glabra	Ohio Buckeye
Alnus glutinosa	Common Alder
Betula papyrifera	Paper Birch
Celtis occidentalis	Hackberry
Gleditsia triacanthos inermis	Thornless Honeylocust
Quercus macrocarpa	Bur Oak
Tilia species	Linden – American and Littleleaf
Conifers	
Thuja occindetalis	American Arborvitae
Juniperus scopulorum	Rocky Mountain Juniper
Pinus species	Pines: Limber, Lodgepole, Mugo, Ponderosa, Scotch
Picea species	Spruce: Black Hills, Colorado Blue

Proper Planting and Fertilizing of New Trees



nitrogen to 1,000 square feet). This bag of fertilizer with this analysis of nitrogen would be able to treat a total of 10,000 square feet of area at the rate of 1 pound of actual nitrogen per 1,000 square feet (10 pounds of nitrogen in 50 pounds of fertilizer @ 1 lb/1,000 sf = 10,000 sf).

When looking at a bag of fertilizer for nutrient information, the data will note that nitrogen is available from different sources – synthetic organic, natural organic (expressed as WIN – water-insoluble nitrogen) or inorganic (expressed as WSN – water-soluble nitrogen). When selecting a fertilizer, one-third to one-half of the nitrogen source should be in one of the organic or WIN forms. Nitrogen in this form is available more slowly and is not as apt to leach through the soil as quickly as the WSN forms might. Typical slow release forms of nitrogen are urea formaldehyde (UF), isobutylidene diurea (IBDU), methylene ureas (MU) and sulfur-coated urea (SCU).

The fertilizer/herbicide products available on the homeowner market for turf areas are a potential source for damage to trees when applied to areas under the tree canopy. The active component is often Dicamba, which may cause decline and stress, and possibly contribute to the loss of established trees.

Application Calculations

The area to be fertilized under a tree canopy forms a circle. To calculate the square footage, take the radius squared x 3.14. Suppose a tree has a canopy radius of 15 feet. This would equal 706 square feet that would be considered for fertilizer application. The 50-pound bag of fertilizer that is going to be used has a nitrogen analysis of 20 percent. To get **1 pound of actual nitrogen per 1,000 square feet over that area of 706 square feet, we divide the area to be fertilized by 1,000 (706/1,000 = 0.706). Because 5 pounds of 20-5-10 is needed for 1 pound of actual nitrogen, then 0.706 square feet x 5 pounds would equal 3.53 pounds of this fertilizer needed for this area.**

Another method of fertilizer calculation is to measure the trunk diameter of the tree at about 4.5 feet above ground level. Using this method, the amount to use is 1 pound of fertilizer for each inch of trunk diameter, if the analysis is 20-5-10 or something similar. If the analysis for nitrogen is 10 percent or lower, then use 2 pounds per inch of diameter. Excessive nitrogen application should be avoided, especially on young trees, because this may cause soft, spindly growth.

Whether using the broadcast, root feeder or soil auger method of application, spread the nutrients as uniformly and evenly as possible for uniform nutrient uptake. Most of the fibrous roots are near or beyond the drip line of the tree and absorb the plant nutrients from the soil. Avoid applying fertilizer closer than 2 to 3 feet from the trunk.

For more information on this and other topics, see **www.ag.ndsu.edu**

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