Fig. 1.—Trees can be held safely in “heeling in” trenches for weeks if supplied with water every few days. (Photo by U. S. Forest Service.)

Trees which are planted for the control of erosion, for windbreaks, as protection and a source of food for wild life, for Christmas trees, or for timber products are small in size—usually less than 18 inches in height—and they can, therefore, be handled differently than larger trees. Care in the handling of the trees upon arrival and correct planting are of prime importance. Poor sur-
vival and growth are often traceable to carelessness with the trees after they are received from the nursery.

**CARE OF TREES ON ARRIVAL**

Assuming that the trees have been shipped from a nursery within the State or from an adjacent state and that the trees were well packed at the nursery, the packing material should contain enough moisture to keep the tree roots in good condition for at least 48 hours. If the trees are to be held in this condition, they should be put in a cool moist storage place. There is some danger of molding if the trees are stored under too high temperatures. If there is any suspicion that the roots may need additional moisture or if the trees are not to be planted for a few days, they should be unpacked and “heeled in.” Preferably the “heeling in” site should be shady and moist and if possible near to the planting site and to an available water supply so that the tree roots can be supplied with ample moisture. The latter consideration is particularly important if some of the trees may not be planted for a week or more.

“Heeling in” trees consists of spreading the unpacked trees in a previously dug trench, then covering the roots with soil well packed down (Fig. 1). The trench should be dug about one foot wide and one foot deep. Its length will depend on the number of trees to be heeled in. A trench will hold approximately 200 seedlings per foot and correspondingly smaller numbers of larger trees. One side of the trench should be sloped at an angle of approximately 45 degrees. Trees are usually packed in bundles of 50 to 100. The individual bundles should be opened and the trees spread in a thin layer against the sloped surface, with the tops of the trees above the ground line. After the trees are in place, the roots should be covered with soil, care being taken to work the soil well between the roots. The soil should finally be tamped so that it will rest firmly against the roots. Finally water should be applied to insure an adequate supply of moisture for the trees. Water should be applied every few days subsequently. If natural shade is not available, an artificial screen of canvas or burlap may be constructed a foot or two above the trees. This will allow ample ventilation and yet protect the trees from the hot rays of the sun.

The trees can be held in this manner without damage for several weeks. However they should be held no longer than is absolutely necessary because early planting is advantageous. If held too long, growth will begin, after which the trees will be damaged in planting.
SITE PREPARATION

Preparation of the site in advance of planting is desirable on sites occupied by a rank growth of grass. It is particularly advantageous where a fairly large area is to be planted inasmuch as more rapid planting is possible where the preliminary work has been done previously. Plowing of shallow furrows at intervals equal to the distance at which the trees are to be set is an economical and effective means of site preparation. The furrows should be shallow—only deep enough to turn the sod effectively. If the furrows are too deep the tree when planted in the bottom will have most of its roots in the less fertile subsoil. The furrowing destroys the grass temporarily on a narrow strip and thereby the tree is relieved of vegetative competition during the most critical period—while it is small and not well established. It also makes the work of planting easier. Plowing of the furrows during the fall prior to the next spring’s planting is advantageous in that it allows the soil to settle during the winter. If the planting area is on a slope, the furrows should follow the contour to avoid the development of soil erosion.

If the planting area is small, irregular in shape, or too rough for plowing, it will be more practical to prepare the site by “scalping.” This process involves the removal of the vegetation on an area at least 18 inches in diameter at the point at which each tree is to be planted. The scalping need not be done in advance of planting although advance scalping will save time in planting. If the planting job is small, scalping can be made a part of the planting operation. The shovel, spade, and grub-hoe are satisfactory tools for scalping.

PLANTING METHODS AND TOOLS

When the planting is to begin, the trees should be removed from the heeling-in trench. If the trench is near the planting site, a supply of trees sufficient to last an hour or two can be taken. If the planting site is far removed from the trench, a day’s supply of trees may be taken to the planting site and part of them again heeled in temporarily. During the process of planting, the trees may be carried in a pail or tray. The tree roots should be well protected at all times to prevent their drying out. Wet moss or burlap is satisfactory for this purpose.
Fig. 2.—Careful planting is essential to success. (Drawings by U. S. Forest Service.)
The shovel and grub-hoe are the tools preferred by the majority of planters, although some planters prefer the spade. Either of these tools should be used to dig a hole large enough to accommodate in its natural position the entire root system of the tree. The hole should be sufficiently large in diameter so that the roots will not be compressed and it should be deep enough to prevent “folding over” of the ends of the longer roots. Crowding of the roots may seem unimportant, but experience has shown that trees with badly crowded roots either die within a year or two or make inferior growth, often for many years.

After the hole has been dug, the tree should be held in a vertical position in the hole at approximately the same depth as it grew in the nursery. (The ground line will show on the stem of the tree.) The tree may be planted one-half inch or so deeper than it grew in the nursery. Too deep or too shallow planting is harmful.

After the tree is in its proper position, the soil should be scooped into the hole, preferably by hand and packed firmly around the roots. The final operation in planting the tree is to compact the soil around the tree by tamping two or three times with the foot. A compact soil will prevent drying out around the roots and will carry moisture to the roots satisfactorily. Careful planting will mean much to the future welfare of the tree.

REPLANTING

If weather conditions are favorable during the first year or two after the trees are planted, a large percentage of the trees should survive if they were well planted. Unfavorable weather in later years is not so likely to prove fatal. If less than 85 per cent of the trees survive, it is generally advisable to replant the fail spots. For windbreak plantings it is desirable to have a 100 per cent stand of trees. The replanting should be done the first or second year following the original planting in order to take advantage of the areas cleared of vegetation and in order that the trees of the original planting will not have a distinct advantage in size over the newly set trees.

PLANTING SEASON

Broad-leaved (deciduous) trees can be planted either in late fall or early spring. Conifers succeed best if planted in spring.
Planting should begin as early in spring as the condition of the soil will permit. This will usually be early in March. Early planting is advantageous in that the tree is then thoroughly dormant and, therefore, not easily damaged in planting and it will have the advantage of the spring rains and be in a position to start early growth. It is not safe to plant conifers after new growth has started. Fall planting of conifers is not generally recommended, although during especially favorable seasons it may not be objectionable.