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Planting Trees in Autumn. It is a very common and widespread idea that most planting should be deferred until spring, that autumn is a rather unsafe time to plant or transplant trees or shrubs and many other plants, and that spring is much to be preferred. In some exposures and with some kinds of plants, this is to an extent true, but much more depends upon the care taken in digging and handling the plants before resetting and the care taken in preparation of the soil and in the manipulation of the roots when making the final planting.

The transplanting or removal of plants from one nearby location to another is naturally a much simpler and safer operation than when they are transported for some distance and the actual conditions of previous handling are unknown. For, if roots are exposed to the sun or drying wind for even a few minutes when dug or during transportation, they are very likely to have the important slender, threadlike rootlets destroyed so that a new crop of these must be developed before the plant is able to become stabilized in its new environment. Conifers are especially sensitive to any exposure of roots to sun or drying winds. It must be remembered that these finer roots are the organs which take up water, etc., to carry on the functions of growth and the more and better preserved these are the more readily adapted will the new plant become when transplanted.

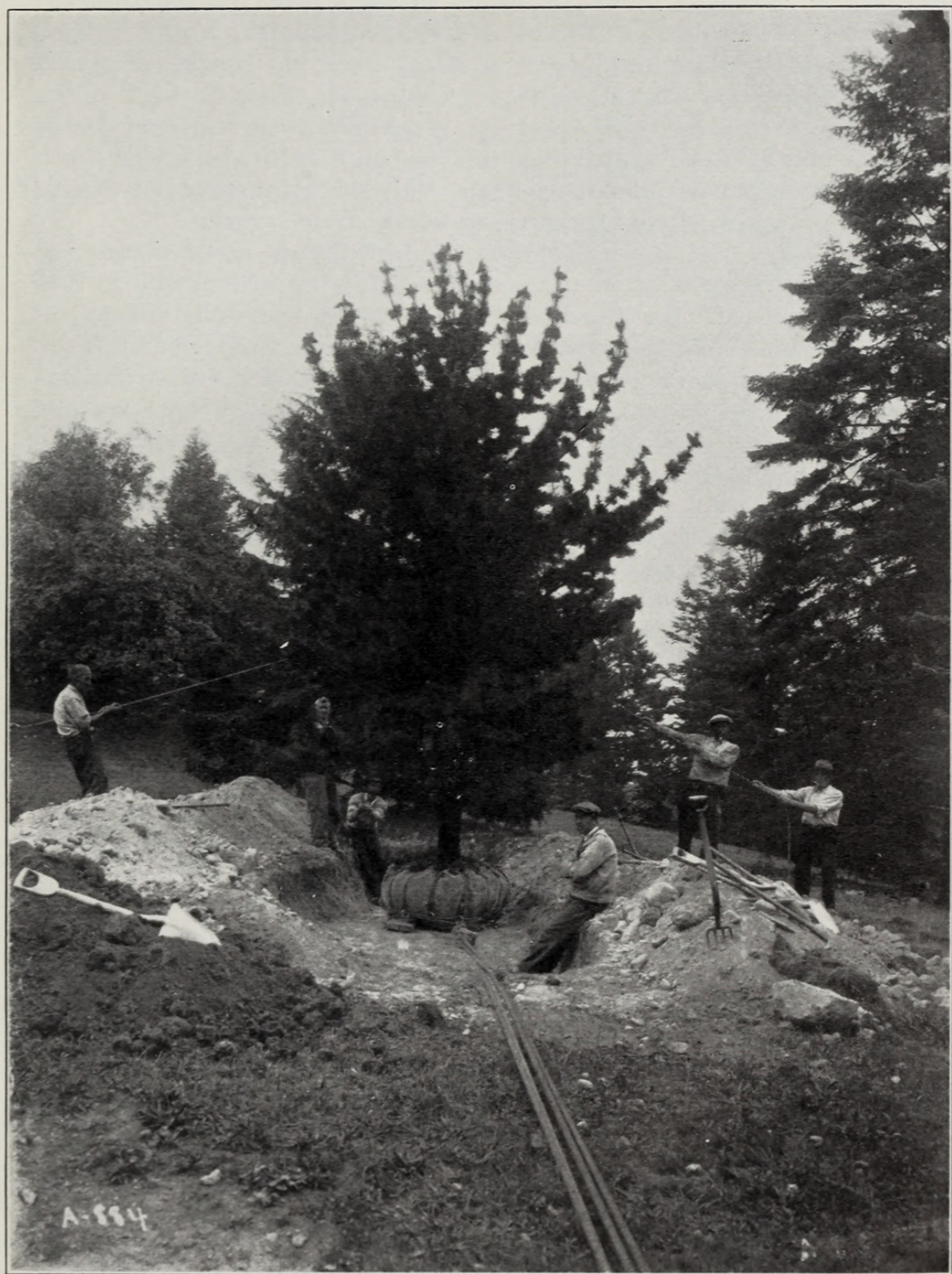
Besides actual care in digging and transplanting there are several other factors to be considered. If it can be avoided, most trees and shrubs should not be dug or planted in a really dry time unless facilities for thorough watering before and after planting are available. Wet soil causes minute earth particles to cling to the rootlets and so protects them when dug and when transplanted they should have good moist earth about them so that the rootlets may continue growth uninterruptedly. For these roots and rootlets must be able to function and supply a certain amount of moisture to the leaves, buds, branches and bark if the tree or shrub is to pass through the winter with little injury and be promptly responsive in the spring with

development of satisfactory growth. If autumn planting or transplanting is begun early in the season, before the season's growth has well matured and leaves still persist and are green, it is well to pull off a large proportion of the latter so as to prevent excessive transpiration which must be drawn from the crippled roots. As a rule the larger the root area lifted with a plant and the corresponding allowance for root spread in the new location, not crowding or bunching the roots in an inadequate hole, the more satisfactory the results will be. It should be remembered that many trees have a spread of roots exceeding the spread of branches. Thorough tamping or tramping of the soil above and about the roots is essential, allowing no holes or air pockets, but leaving some loose soil on the top. Planting loosely, that is without making the soil really firm or packed about the roots, is often a cause of poor response in the transplanted tree.

In autumn planting much depends upon the earliness or lateness of the season when the work is done in any region having generally such severe winters as our New England and northeastern states. Of course, in milder regions transplanting may be carried on all through the winter. Where frost goes deep into the soil it is always best to plant fairly early in the autumn so that plants may adjust themselves before freezing. Heaping of some soil about the stems, bringing it well up above ground level for the winter is generally a good practice and, of course, there is advantage in mulching with leaves, strawy manure, etc. Not only hardy but some half-hardy or rather tender trees and shrubs may be planted in the autumn if the soil is removed somewhat on one side of the plant and it is bent over, pegged prostrate on the ground and given a good protecting mulch of leaves or straw. Very large trees should be preferably moved with large balls of earth which may be frozen to insure adherence of the soil to the root system. In spring planting it is not so important that the soil be removed with the trees, if that the roots are not allowed to become exposed and the soil is repacked firmly about them, as it was about the roots before removal.

These suggestions refer to ordinary fruit and ornamental trees and shrubs. Apple trees may be as well planted now as in spring. Cherry, peach and plum trees, commonly known as stone fruits, have the reputation of being less adapted to autumn planting but these also may be planted with comparative safety if the planting is done early rather than late. In planting at this time, especially with small plants on exposed ground, the greatest danger arises from freezings and thawings of the ground, with the consequent expansions and contractions, thus heaving or throwing the plants out of the ground. This may be obviated by proper mulching after the first real freezing of the surface soil.

On the whole it is doubtful whether there is any more loss of plants in careful planting in autumn than there is in the average spring work of the same kind. Much spring work is carried on so late that the plants to be set out have become weakened by premature sprouting which is checked or dies, necessitating a new development of buds



Tree Moving in the Arnold Arboretum

when weather has already become unfavorably hot, causing delayed growth and general retardation of development throughout the season. While autumn planting appeals or should appeal to the orchardist, gardener and landscape architect, it may also be economically and profitably practiced by the forester. In tests made at the Harvard Forest at Petersham, when the University maintained a Forest School, students planted some thousands of White Pine, in October, on unused grassy pastures, using mattocks in making the holes or slits in the turf. The next season showed a loss of less than one per cent. Labor is also usually more available at this season than in the spring when help is in much demand to compete with the on-rushing growth of vegetation which is characteristic of our northern climate.

It is always well to keep in mind the fact that in proportion as the root system is reduced in the process of digging and handling, it is less able to care for the multitude of twigs and buds which had developed under normal conditions. If all of these twigs and buds are allowed to remain they may become more or less dry and devitalized because the few remaining abbreviated roots cannot take up and supply enough moisture or sap to keep the plant tissues and buds from drying. This danger may be guarded against or counteracted by the careful elimination of some of the branches and twigs, and the cutting back of others to a bud or crotch. The plants are then in far better condition to throw all energy into the remaining parts. This practice applies to broad leaved or deciduous trees and scarcely applies to hardy coniferous evergreens. In these pruning is hardly practicable and more careful attention must be given to having and preserving good roots in the transplanting process.

In our cold northern country autumn planting is usually better done early, as soon as the wood is fully mature. But it may be carried on until the latter part of November or the ground begins to freeze. In exceptional seasons it has been possible to plant until well into December. To move with a frozen ball of earth about the roots is good practice, but plants should never be handled when branches are frozen unless handled with great care. Whether or not planting is done in the autumn it is an excellent plan to prepare the ground in the autumn for planting which can only be done in the spring. The turning of the soil, exposing it to the action of frost causes it to become finely broken up and in better condition for planting in the spring. This is especially true in heavy or clay soils. Where dynamiting holes for tree planting is practiced it certainly should be done in the autumn so that frost may complete the breaking up or disintegration of the soil.

Our illustration represents a Limber Pine (*Pinus flexilis*) being moved in the Arnold Arboretum on September 27, 1929. The root system had been cut the year before by a narrow trench, which induced a mass of fresh rootlets at the severed ends in preparation for removal of the tree the next season. The root area was rather smaller than generally advisable but the illustration shows how carefully they were folded up and protected by burlap from injury by exposure to sun and wind.

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