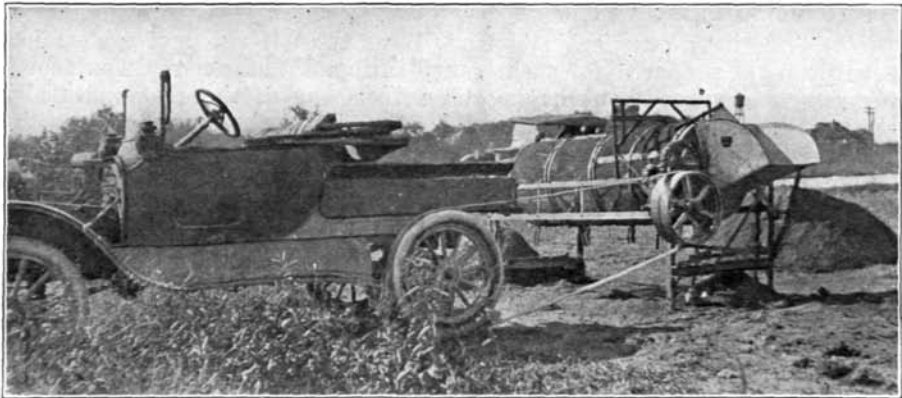


Power Transmission Direct from Automobile Wheel



Automobile Driving Revolving Screen

This illustration is furnished by Dr. J. L. McBride, Chairman of the Grounds Committee, Shannopin Country Club, Pittsburgh, Pa. It shows the method devised by the greenkeeper of the club for obtaining power from an automobile engine for driving his revolving screen. Dr. McBride writes that the back wheel of the automobile is blocked up and the transmission belt connected directly with the pneumatic tire of the automobile. The revolving screen in the illustration has been operated in this manner half a day without stopping and without the engine of the automobile heating.

Transplanting Trees

By F. L. MULFORD, *Horticulturist, U. S. Department of Agriculture*

Deciduous shrubs and trees are ordinarily moved when dormant or from a little before the leaves drop in the autumn until growth starts in the spring. With extra care they may be moved at other times. In the eastern half of the United States they may be moved either fall or spring, whenever the ground is not too wet. On the Pacific Slope fall is best, because there is a longer time for roots to form before hot, dry weather comes. In the colder parts of the intermediate region spring transplanting only should be attempted unless it is possible to water the plants thoroughly in the fall, to mulch them to prevent the ground from freezing as deep as the roots extend, and to protect the tops by wrapping or boxing so that the winter winds will not dry them out. In the warmer sections of the intermediate region, the longer before hot weather the planting is done, the better, provided ample water can be supplied. The secret of successful transplanting is getting a good root growth started before top growth makes too heavy a demand upon the roots. In cool, moist climates there is not the same care demanded as in warmer or drier ones.

Evergreen plants are moved at such times as root growth is most likely to take place rapidly. This is necessary, because these plants are constantly covered with foliage demanding moisture for evaporation, and this must be supplied or the plant dies. For this reason, too, these plants must be moved with earth about the roots or, as it is called by nurserymen, with a "ball." The time for doing this in spring is when the growth of the

evergreen is well started, and in the late summer or fall after the rains begin until about a month before it is cold enough to freeze the surface of the ground at night.

It is entirely practicable to move large trees if the root system has been properly prepared for such transplanting. Where a tree has grown for several years without having been root-pruned, the roots naturally have extended some distance in search of food and there remain near the trunk only a few of the main carrier roots, the feeding rootlets being at the ends of the growing parts. In order to transplant the trees satisfactorily it is necessary to cut off some of these feeding roots not far from the base and thus cause new ones to form near the body of the tree so that they may be moved with it. It is because this has been done with nursery-grown trees that they are better than trees taken from the wild. By digging around the tree a year or two in advance of transplanting, this change of root system can be accomplished. It is probably best to dig part way around the tree one season, say one-fourth of the way around on each of two sides of the tree, refilling the trench with well-enriched earth, and completing the operation a second season. In this way new roots will be formed which can support the tree after it has been moved. There are professional tree transplanters who move trees of great size, but it is essential that the trees be in good condition in order for the transplanting to be successful.

In favorable localities trees that form an abundance of roots quickly, such as willows, poplars, and elms, may be transplanted from open fields, in sizes up to a foot in diameter, without previous preparation, or better by digging a trench about the tree the middle of the previous summer provided constant attention can be given the following two years to supplying an abundance of water, sometimes every day if weather conditions should demand it.

At the time of transplanting, the soil must be of such a texture or sufficiently dry that there will be no danger of its packing hard or baking about the roots when it dries out. Light soils are not likely to behave in this way; and heavy soils will not, provided they are sufficiently dry.

The holes should be dug sufficiently wide to take all the roots without doubling them back, and deep enough to set the plant a little deeper than it grew before and still have two or three inches of good new soil under it. The good top soil should be saved for putting back in the hole about the roots of the plant. The sub-soil should be taken away, replaced by good top soil. Well-rotted manure and ground bone or cottonseed meal may be mixed liberally with the earth in which the tree is set, but should not come in direct contact with the roots.

The plant should be set not over an inch deeper than it grew in the nursery. The earth should be fine and well worked in among the roots. These should be placed as nearly as possible in the position in which they grew, care being taken not to leave them in layers without soil between. The plant should be gently worked up and down to be sure that there is no opening left under the place from which the roots branch. After the hole is partially filled, the soil must be well tamped to bring the roots and soil into close contact with one another. If the earth is very dry, water should be applied before the hole is finally filled. After the water has soaked away, the balance of the soil should be replaced, but without any tamping or firming of any kind. If the work is being done in the fall it is well to make a mound around the plant to prevent wind from swaying it and loosening it in the soil. This mound around the tree should be used only

in fall transplanting and should be leveled down as early as possible in the spring. If the plant is large, it should be securely staked to serve the same purpose. Mulching with coarse manure or straw will aid in cold regions by preventing frost from penetrating the ground below the roots and in dry regions by holding moisture.

The holes for evergreens must be wide enough to permit of easy placing of the ball and filling good well-enriched soil around it. The holes must be deep enough to permit of placing good soil under the ball and still having the plant at the same depth at which it was before transplanting. To accomplish this it is usually best to start with the hole two or three inches deeper than the ball of roots and then gradually to work soil under the ball until it is about one inch deeper than desired. When settling is completed it will probably be about right. Only good top soil, well enriched, as for deciduous trees, should be placed about the ball, and the soil should not be so wet as to be likely to puddle—that is, to bake into brick-like masses—upon drying. If the soil after being squeezed together in the hand springs apart on being released, it is not too wet; but if it remains in a sodden mass it should not be used.

The soil should be packed firmly about the ball of earth, and then well watered. To facilitate watering, it is best to construct a saucer-shaped depression around the plant, into which the water can be poured without its running off before it has a chance to soak into the ground. This watering must be repeated frequently until the plant becomes re-established. In dry times or climates, this will need to be daily, but in moist climates it need not be so frequent in an ordinary season. The tops should, however, be sprayed frequently in order to reduce the evaporation from the foliage as much as possible. Several times a day is best; but this, although essential in dry regions, is frequently impracticable. A burlap screen on the windward side is a great help in protecting against drying winds.

The top of the plant must be pruned somewhat in proportion to the amount of roots which was destroyed in digging. This usually means that one-half of the top should be cut away when the plant has been well dug and well handled, and three-fourths or more if it has been poorly dug or handled. As far as possible, this should be done by removing whole limbs or branches rather than by cutting back the ends, so that the general shape or character of the plant may be preserved.

Failure in transplanting is most often due to the drying out of the plant, and especially its roots, during one or more of the operations. Success depends upon keeping the roots covered with wet moss, straw, or other efficient covering at all times while moving and while in the ground when not actually being transported. If plants can not be placed in their permanent location immediately upon receipt, they should be put into the ground temporarily until the final planting can be attended to. This is usually called "heeling in." It is often a help, in protecting the roots from drying out too rapidly and assisting them in coming into immediate contact with the soil, to dip them in very dilute clay and cow manure just before planting, or even clay alone.

As a rule, evergreens are not pruned at transplanting. When pruning is however necessary, great care must be used not to mar the beauty of the plant. With many evergreens, pruning is almost or quite ruinous to their appearance. This is an additional reason for the use of great care in handling the plant so as not to loosen the contact of the roots with the soil. If the ball is roughly handled or cracked, this loosens the contact of

the roots. Likewise the plant should not be permitted to lie around after receipt. If planting can not be attended to at once, it is well to bury the ball, burlap and all, and water regularly until planted.

Evergreens are often planted without removing the inside wrapping of burlap next the ball if the soil is inclined to loosen, provided there is no straw or other packing inside the wrapping. Burlap is usually rather loosely woven, and small roots will easily find their way through it. This growth of roots through the burlap may be facilitated by cutting some gashes in the wrapping at several points on the sides and bottom, care being taken not to cut the roots. When planting is nearly completed, the burlap which might protrude above ground can be cut off just beneath the ground level. If canvas or other thick, heaving wrapping material has been used, it must be removed before planting, as it would act as a barrier to the passage of both moisture and roots, as would also a layer of straw or similar packing material.

In the landscaping of golf courses, native trees should be largely used, as they will aid materially to a course's fitting in with its immediate surroundings, and moreover they are more likely to thrive than are imported kinds.

In the South, broad-leaved and cone-bearing evergreens should be used rather liberally, largely to relieve the winter bareness that would result if too large a proportion of deciduous trees were used. In the North, a few evergreens, which of necessity will be largely cone-bearing kinds, should be used for the sake of the contrast of form and color they provide, but the proportion should be small, as otherwise the general effect would be heavy and possibly depressing.

Owing to the excessive evaporation caused by dry winds, few evergreens can be grown successfully in the dry central and western portions of the United States, especially where unprotected by buildings or other trees. There are some kinds, however, which may be grown even under rather severe conditions, such as cedars, Austrian pine, Black Hills spruce, and arbor-vitæ. For such regions, therefore, most of the plantings should be native deciduous trees.

Much can be gained in attractiveness by including some of the showy flowering trees that will add touches of color at different seasons, provided rules against the pulling of the flowers would be observed by members of the club and could be enforced against others. It would seem that golf clubs should be an example in this respect. This is a question, however, which must be decided by each club for itself.

In some locations a quick, tall growth may be desired, in which case forest and shade trees may be planted closely together, as closely as 12 or 15 feet apart; while in those locations where a spreading effect is desired, a single specimen of a broad-growing tree may be used. Often the best effects are secured by having the foliage rise directly from the turf without the trunks being visible. Many of our trees may be grown satisfactorily in this manner, while under other conditions a fringe of shrubs may be necessary for obtaining the result. Two deciduous trees which are especially good for producing this effect are Norway maple and beech. Among the cone-bearing trees, spruces, firs, and hemlock are particularly adapted for this purpose.

The editors are always glad to receive notes of interest for publication in *The Bulletin*. Contributions from greenkeepers and greencomitteemen are always welcomed.