

# Look to Root System, Trimming and Staking in Tree Transplanting

By MARTIN L. DAVEY\*

SOMETIME ago I visited an eastern golf club where a considerable amount of money had been spent in an attempt to beautify an almost treeless course by the planting of a large number of small elm trees.

My first impression was that this beautification effort was quite laudable. However, when my interest was aroused and I paid closer attention to the trees, I discovered that the effort was not as laudable as it might have been. A number of serious mistakes had been made in planting the trees and the results were anything but satisfactory.

A hasty check-up revealed the fact that fully a third of the trees were dead or on the verge of dying. No planting done on a wholesale scale can be expected to be 100 per cent successful, but when more than ten trees out of every hundred die something is usually wrong. In this case it was obvious that plenty was wrong.

To satisfy my curiosity I pulled up one of the trees which was dead. I found what I expected—the tree had been transplanted with the faintest possible excuse for a root system. The main roots had been cut off not more than eight inches from the base of the trunk and there were practically no root fibers, essential for supplying the tree with food or water. The tree had been robbed of a fighting chance to live.

There was no way to tell how many of the other trees had been

transplanted with such inadequate root systems. But even if this tree was a lone exception, and the others had all the roots they should have had, there were plenty of other reasons why so many died.

## Neglect Ruins Tree Chances

The trees apparently had been entirely neglected from the time they were transplanted. The ground above their roots was caked and hard—it gave no indication of ever having been cultivated, mulched, or fertilized. Beneath the hard-baked crust the earth was dry and sandy and contained little if any organic matter. None of the trees had been staked out and, as a result, a number had been knocked over or blown over. None had been properly pruned. In fact, the transplanting job had been bungled from start to finish. It was a mys-



This large, pluming tree, a landmark at Chicago G. C., was scorched during the clubhouse fire of 1912. John MacGregor, club's star greenkeeper, enlisted aid of tree experts in fighting inroads of decay that followed fire injury. The treatment was successful, the tree is thriving, and the club doesn't lament the money spent in preservation of this striking spot in the landscaping.

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tery how any of the trees survived.

The attempted beautification project probably cost at least several thousand dollars. If the trees had been properly transplanted and given proper care until they became established, they would have been worth every cent they cost. In time they would have provided magnificent adornment for the golf course. But as it was, a large part of the expenditure was wasted.

This instance is not mentioned in any spirit of criticism; it is mentioned simply to bring out the point that in many cases golf course officials pay less careful attention to their trees than they do to greens and fairways. However, inasmuch as I am deeply interested in trees, it may not be amiss to mention briefly some fundamental points which, if followed, may help to eliminate costly mistakes made in tree planting.

Before any tree planting program is launched, it is usually necessary to make a detailed survey of the golf course, paying particular attention to the types of soil encountered and the degree of moisture in the ground. Some species of trees thrive best in a moderately moist sandy loam—if they were planted in a very rich, wet soil they would probably perish. The opposite of this is, of course, likewise true.

Attention should be given to the proper spacing of the trees. In altogether too many cases trees are planted too close together. The result is that their tops are prevented from developing normally—they become mis-shapen and sometimes the health of the tree is undermined. No trees, even the smaller species, should be planted closer than 35 feet apart; elms should be planted from 50 to 60 feet apart. In all cases, they should be planted so that when the tree becomes mature the branches can have a normal spread without touching the branches of a neighbor tree.

In determining the kind of trees which should be planted, it is generally best to select trees which are native to that particular locality. Exotic species often do well when planted outside of their native environment. However, native trees can be planted with a greater degree of assurance that they will live and they always have the additional advantage of being representative of the locality.

It is next to impossible to give a list of trees which are most suitable for golf course planting in all parts of the country. There are a number of old favorites, however, which are popular in all parts of

the United States except in the extreme south, the arid and mountainous regions of the west, and the warmer parts of California.

### Names Favorite Trees

Of these old favorites, those which grow satisfactorily in almost all soil except extremely dry sandy soil or extremely wet soils, are: American elm, Norway maple, European or Oriental plane, sugar maple, red maple, pin oak, white oak, horse chestnut, white ash, and basswood. Scarlet oaks should have a well drained, gravelly soil, white oaks should have a well drained loam, and sweet gum, American linden and tulip trees should have a deep rich soil. For soils which are swampy, native willows and native poplars are usually best adapted. If the soil is not too wet, pin oaks often do quite well.

Numerous splendid species have not been mentioned in the above list. No tap-rooted trees are included, for instance, simply because they usually are hard to transplant with good results. Birches are not mentioned because they cannot resist the attack of bronze birch borers. However, if a certain tree is thriving in a certain locality and it has desirable characteristics, it can of course be used. But in case of doubt, it is always well to consult either a tree expert or the state or national agricultural department.

There is often a temptation because they can be obtained cheaply to use trees which have sprung up in the open fields or in the brush. In many cases, however, they often prove to be very expensive trees. Usually it is difficult to dig them up economically and gather them together for transporting to the point desired. They also have another drawback — their roots usually roam far and wide, and it is often extremely difficult to obtain enough of the root system to sustain the tree after it has been transplanted.

Nursery grown trees, on the other hand, usually have a quite compact and fibrous root system, due to the fact that they ordinarily are root pruned and replanted several times at various stages of their growth. Moreover, the soil in which they are grown is usually well cultivated and the growth of many fine root hairs encouraged. Because of their better root systems, nursery grown trees usually have a good chance to live when transplanted, even though much of the soil around their root fibers is lost while the trees are in transit.

Regardless of whether trees are taken from the nursery or from the brush, great care should be taken in digging them up. It is safe to say that more transplanted trees die because they have been improperly dug than from any other cause. When they are simply half dug or torn from the ground, the trees are not given a fighting chance to survive. It is essential that as many of the root fibers as possible be kept intact and uninjured.

### Care in Transplanting

When a sapling about three inches in diameter is dug up, it is usually necessary to spade in a circle about 18 inches from the trunk and then to carefully work under the root system until it is free. If possible, much of the earth around the roots should be retained, but even when this cannot be done, the proper method of digging assures an adequate root system, and when the tree is properly transplanted the numerous root fibers aid the tree immensely in its struggle to become established.

After the trees are dug, it is imperative that their roots be protected from drying out. If they are exposed even for a few minutes on a hot, windy day, they will suffer greatly. When the trees are shipped from a nursery in large lots, they should be heeled singly in trenches immediately upon receipt. They should be taken from this temporary home as needed and while they are being transplanted the same care as before should be taken to prevent the roots from drying out. Too much emphasis cannot be placed on this point—innumerable trees are killed every year because their roots are dried out and killed through carelessness.

The hole for the tree should be wider than the roots and 18 inches or more deep so that the roots will have ample room to be spread out naturally. If the soil is heavy and soggy, provision should be made so that it will not fill with water and drown the roots. In some cases it is necessary to run drain tile from the bottom of the hole to a suitable drainage point. If this is not practical, good results often can be obtained by blasting out the hole instead of digging it. After the hole is prepared it should be filled with a mixture of three-fourths top soil and one-fourth well-rotted manure up to where the bottom roots will come.

Before the tree is transplanted, all broken or injured roots should be cut off

smoothly with a sharp knife. The tree should then be set in the hole and raised or lowered enough so that when the planting is completed it will be a trifle lower than its natural depth before transplanting—in no case, however, should it be more than two inches deeper than it was originally.

When the tree is set in the hole, earth should be worked under the crown and firmly packed down. As more earth is added, the tree should be rocked so that the soil will settle firmly around the roots, leaving no air pockets. When the hole is three-fourths filled with earth, water should be poured in up to the top. When the water settles the fill-in can be completed. The top-soil should be left loose to prevent rapid evaporation of the water. In no case should the earth be mounded up around the trunk.

In every tree there is a definite balance between the top and the root system. If this balance be disturbed by the loss of part of the root system, it is essential that the balance be restored through proper pruning.

This work should never be done by anyone who has not had proper training and experience. If the work is done improperly the tree can be greatly injured. Inasmuch as almost every tree presents different problems, it is extremely difficult to lay down any general rules which fit all cases. However, there are a few points which should always be remembered. When it is necessary to remove limbs, they should be cut off flush with the trunk in order to permit rapid healing. If any projecting stubs are left, they often rot back quickly and endanger the life of the entire tree. All wounds should be covered with a protective dressing which keeps out the air and moisture, wards off insects, and prevents bacterial and fungous diseases. The leader or central stem of the tree should be retained as well as branches necessary for forming a well balanced, symmetrical crown.

### Stake to Avoid Root Injury

After the trees are planted they should be staked. If this is not done they are very likely to sway back and forth in the wind and the root systems will be disturbed and seriously injured; likewise, prevailing winds often cause the trees to grow in a slanting position unless they are staked to hold them upright. The tree should be fastened to the stake in such a manner that the bark will not be injured.