

# The Utilitarian Value of Trees

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There is a widespread belief that the purpose of trees on golf courses is mainly ornamental. Their utilitarian value is rarely appreciated. The object of this article is to point out some of the important functions of trees and to outline problems presented in their selection and planting.

Trees, like all other forms of life, have their individual requirements for healthy growth. Of these the most vital is suitable soil.

According to agronomists, there are more than 2,000 kinds of soil on the earth's surface. For practical purposes these are reduced to 16. On the grounds of the Oak Hill Country Club we have found eight varieties, but for purposes of brevity only five will be described.

Soil types in most of the northern half of the northern hemisphere were determined in large part by the last glacial epoch which began 50,000 years ago and lasted for 25,000 years. There were four of these ice caps, with intervening periods of about 100,000 years of temperate climate. Indeed, glaciologists believe we are now living in such an interval and that it will be followed by a fifth ice cap.

The last, or fourth, great ice sheet, as it affected the eastern part of the United States, began as a glacier in Labrador and Quebec. Slowly it pushed south and west like a mammoth bulldozer, gouging, scraping and pushing the soil and rocks in its path. Huge deposits of earthy detritus were transported from the north. As the climate became warmer and the ice receded, this material was deposited as hills and ridges, which we know as drumlins, through our northern states.

About 300 million years ago the grounds at Oak Hill were part of an inland salt sea, the bed of which was a stratum of clay. The glaciers later deposited the present hills of sand, boul-

ders, gravel, clay, loam and their various admixtures. This accounts for the diversity in our soil structure and the contour. We have large flat areas consisting mainly of clay, some of it almost impermeable to moisture and air, and some which are a mixture of clay and loam. Other plots consist of sand of almost flourlike fineness. Still others are mixtures of the foregoing and rich in humus.

These physical characteristics of soils are significant. A top and surface subsoil largely of sand permits the rapid penetration and loss of water and soil nutrients. There is no storage of needed moisture. This undue drying is worsened by prevailing winds. Top and subsurface soils mainly of clay, because of their low porosity, permit the rapid run-off of rainwater, with consequent erosion and dehydration. Such soils usually are lacking in oxygen, a vital necessity for plant growth. Of the soil elements, that on the surface, the humus layer, is far the most important. Where humus is absent from the soil, a desert will be found.

## Creating Humus

Humus is formed from decaying vegetable matter, as leaves, twigs and grasses. It is almost entirely organic. It supplies the many chemical elements of which soil nutrients are composed. It is on the floor of forests that nature has made most of the humus on the earth. A relatively small amount was produced by the western grassy plains. The forest layer of mulch may vary in thickness from a few inches to several feet, depending upon the type of tree water erosion and the destructive practices of man, its greatest enemy. It will vary in weight from one to 100 tons, oven-dry weight, per acre. After a rainfall, an acre of forest floor may store from 20 to 50 tons of water which later slowly supplies the ground water table and feeds the springs and brooks.

When rains are excessive, by means of their large leaf areas, trees evaporate back into the atmosphere large quantities of redundant water — individual trees as much as several barrels a day. When drought occurs and soils are dry, evaporation ceases completely, and by means of an elaborate root system plus its humus, the soil will hold as much as five times the amount of water that will be found in adjacent treeless areas. Thus trees automatically and efficiently perform the dual functions of irrigation and drainage. It was largely due to these facts that Oak Hill, by the planting of trees, was able to transform abandoned farm land, part of which had already become a semi-desert, into lush, grassy fairways and beautiful, wooded hills.

Since it takes an enormous amount of decayed vegetation and years of time to produce an appreciable amount of humus, the importance of its conservation is apparent. A good forest on a golf course may in time become a nature factory for the production of compost.

Trees are efficient regulators of atmospheric temperature. They cool the warm air of midsummer and temper the cold of winter. The temperature in the woods at Oak Hill in summer averages 3 degrees cooler than on the fairways. Individual trees serve similarly. They also lessen the force and destructiveness of winds. The average velocity of wind in this area is from 7 to 15 miles per hour. A tree plantation will reduce wind velocity from 30 to 60 per cent on the adjacent fairway. Air currents have a rapid-drying effect on fairway turf. This is especially true where the topsoil is largely sand. In addition to the dehydration, winds blow away topsoil, seed and fertilizer. Thus wind erosion may be a serious factor in turf development. Because of this it was not possible to grow a satisfactory turf on three fairways at Oak Hill until several wind breaks of tree plantations were developed. The value of wind breaks increases with the growth and density of the trees.

With these considerations in mind the

tree planter should make such selections of stock as will insure vigorous growth. For example, oaks with their long tap roots do best on deep, porous acid soil. Elms, shallow-rooted, will grow fairly well on any soil if their moisture needs are met. Willows and poplars thrive on wet lands. The pines and spruces vary in their needs. Few of them will grow well in heavy clay. Indeed in heavy clay areas we found it necessary to fracture the clay stratum by dynamiting, thus providing essential root drainage. The holes were then filled and the trees planted in a mixture of humus and loam. Where this was done, good growth resulted. Where it was not done, growth was negligible.

Before selections are made, the tree planter should consult nursery guides and authoritative works on tree culture.

#### Four Values of Trees

Aside from their decorative value, trees should be planted on golf courses for the following purposes: (1) As individual specimens to provide shade and comfort for tees and greens, (2) As small forests or plantations to regulate rainwater runoff and to conserve ground water, (3) As wind breaks to control erosive effects of winds and to temper extremes of heat and cold and (4) As storage reservoirs for leaves, twigs and grass cuttings as a future source of ever needed compost.

Plantings about tees and greens should consist of trees which do not shed their leaves during the golfing season. Oaks have this desired quality. Red, pin and white oaks in the above order are recommended. Evergreens, particularly specimen ornamental varieties, make desirable backgrounds for tees when supplemented by shade trees, as the oaks.

Evergreens should not be used about greens. They unduly penalize stray approach shots and cause unnecessary grief to the golfer. Trimmed evergreens are not beautiful.

Elms and maples should be avoided around tees and greens. Their place is in the rough and about the clubhouse.

Willows, particularly the Wisconsin

## Lawn and Clubhouse at Oak Hill



All the beautiful trees seen in this photograph have been planted and dedicated as memorials within the last 25 years under the direction of Dr. John R. Williams. The site originally was abandoned farm land, and not a tree was visible from this point except for a few of the fence line elms in the distance. This photograph was made by Russ Holderman.

willow, are attractive. With the birches and poplars, they do well along water courses. Because of their tendency to plug drainage tile, poplars should be used sparingly and where they can do no harm.

Plantings along fairways should be so ordered as to create the effect of an avenue. As fairway hazards, trees are superior and far more economical than sand traps. They also may be planted as distance markers. Where possible avoid straight lines. Planting in clumps or

the staggering of specimens adds effectiveness.

Hillside rough is enhanced in beauty by the use of evergreens of various shades of blue and green, interspersed with colorful hard maple, white oaks and white birch. The mountain ash is beautiful and useful as a source of food for birds. In this connection the mulberry is highly desirable. Both of these trees, however, should be confined to the rough.

Dogwoods along the edges of plantations are attractive. Flowering shrubs

and ornamental fruit trees should be used sparingly and only around the clubhouse. They require too much care and are prone to troublesome infestations.

#### Nursery Reduces Cost

Finally, a word about costs and the element of time. Were one to attempt to carry out such a program as is sketched here, using mature or even half-grown stock were it possible to obtain it, the cost would be prohibitive. Landscaping a golf course with trees is a long-time program. In the matter of evergreens, using 2- or 3-year seedlings planted on suitable soil, a growth of from one to four feet per year may be expected. With deciduous trees, such as oaks, elms, maples and willows, a growth of at least one foot per year is usual. Where large numbers are required, seedlings may be started in a club nursery while 8- to 10-foot saplings from a commercial nursery may be set at once in permanent location. In the case of the latter a sizable shade tree will result in from 10 to 15 years. Oaks started from acorns will produce trees which will caliper from 4 to 6 inches in 20 years, while those from 10-year saplings will produce useful shade trees in this time. Contrary to the usual notion, the oak on good soil will grow as rapidly as the elm and make a far better tree.

In the club nursery at Oak Hill during the last 20 years we have grown from seed several hundred oak trees which are now in location and of good size. Moreover, we have a reserve stock in the nursery of more than 5,000 seedlings and saplings. Each year several hundred acorns are planted.

Trees are like humans. They are subject to disease and death. Our casualty rate each year is from 100 to 200 trees. Constant replacement is necessary. Trees of foreign origin are particularly vulnerable to disease and the elements. Scotch and Austrian pine, Norway and Colorado spruce are examples. They are suitable and useful for temporary planting, say 20 years. Hence a replacement plan is an essential part of a well-ordered

program. At Oak Hill, as time and finance permit, we expect to replace the short-lived and undesirable trees with oaks and other material from our nursery. Native trees are the most useful and beautiful.

Trees cannot be made overnight. They result only from time, thought and care. As carried on at Oak Hill the cost has been very little. Twenty years is a long time in contemplation, but in retrospect it is brief. Finally, it should be remembered that trees, like humans, when healthy are attractive from the first year of life. A country club can make no finer contribution to civic welfare than to use its idle spaces for the growth of beautiful trees. With a little intelligent effort and expense, it can justify its existence in the community by creating an arboretum or park which will uplift the whole countryside.

From a practical point of view, by its landscaping program alone, over a period of 25 years and at a cost of less than \$25,000, Oak Hill has enhanced the value of its property by at least \$500,000 and the surrounding home-site areas by another \$500,000. This increment in beauty and value will continue as will its cultural uplift.

This is the second and last of a series. The first was published in the issue of June, 1950, and discussed the aesthetic value of trees.

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#### POSITION OF TRUST

The score card of the Fairfield Country Club in Jamaica, B. W. I., sums up the responsibility of each competitor in the following exemplary language:

"Each competitor holds a position of trust in respect to the whole field of players; and it is his duty not only to play but to see that his fellow competitors play the game strictly in accordance with the Rules and that the scores are correctly marked."