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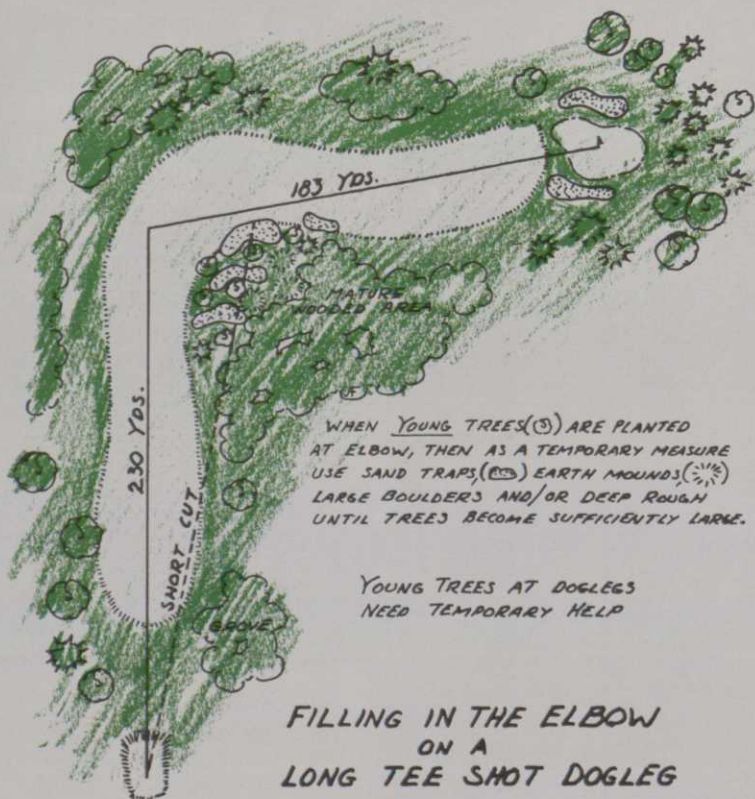
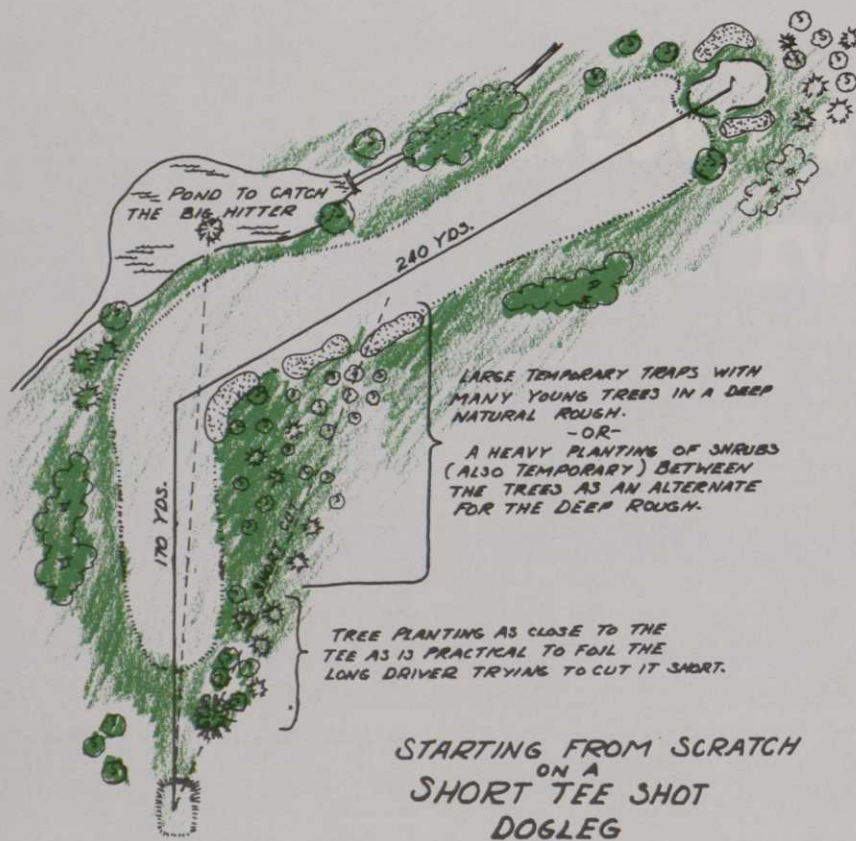
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undergrowth to grow naturally. It will then produce a very difficult lie situation. Those who either hit the ball too short or have their ball stopped short by the tree branches will then pay the penalty for their disregard of this purposeful obstacle.

When to maintain a clean rough

There will be occasions where the tree growth is very heavy and dense and covers almost all areas of rough. This situation presents itself when a course is constructed on a heavily wooded site. These conditions often have trees which tower up to 80 and more feet into the air. In such cases, no golfer, no matter how good, tries to go over the corner. However, many well-intentioned shots come to rest in the woods in such elbows. The ball was either sliced or hooked into this wooded area. If that area presents unplayable lies, then perhaps it should be declared an out-of-bounds area.

If on the other hand, the forest floor can be maintained with short, playable rough, it would then be possible for the golfer to have a fair chance of playing the ball out to a clearing.

The lone tree at the dogleg

Very often when playing a golf course we see a dogleg (or sometimes more than one) being protected by a lone tree. All too frequently there is open sky between the outline of this very important tree and the woods that line the remainder of that side of the hole. In other words, either with ability or luck a ball can find its way through this clearing and land out in the fairway and be in a great position to go for the green.

Again, the decision of whether to allow this situation to continue or not will be up to the Greens Committee at that particular course. If they should agree that this gap should be filled in, then new trees could be started as soon as possible.

Sometimes that lone tree is of such structure that some of its branches may have to be removed in order not to interfere with a legitimate shot. If such is the case it would be wise to hire a professional tree expert who would know how to best perform such a difficult, as well as delicate, task. If the removal of such a large branch would ruin the natural balance of the tree then more branches may have to be removed to maintain a look of natural beauty to the tree.

Also, with the strength of the dogleg depending on one tree, should storm

out to be much cheaper than traps. Once the trees are established, assuming they would be the best trees possible to achieve the results desired, they should require only a minimum of care - to be discussed in a later article.

If the committee responsible for such decisions calls for a few large trees to have an immediate effect, then the cost could equal or be more than that of a sand trap. It should be

mentioned here that if the money is available, you can have trees up to 40 or more feet in height moved in for that instant obstacle. Even if you should decide on one or more large trees to protect that dogleg, a few smaller supporting trees should also be a part of the complete planting.

If after going through all this trouble and expense, the golfers still try to "beat it" then you can allow the

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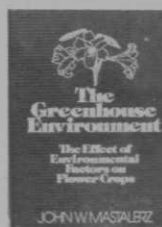
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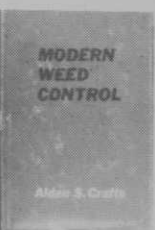
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damage, disease, or natural attrition overtake it, it is then necessary to start over with a new planting. Then at least one, preferably two, back up trees are desirable.

Groves

Trees that inhabit these dogleg areas need not always be of the tall-growing type. Certain trees look their best when growing in groves. A grove of Shadblow (*Amelanchier*) or Gray Birch, for example, would rarely reach over 25 or 30 feet in height. However, if the grove (trees planted rather close together and in large numbers) covers a large area, especially in length, they can serve the same purpose as the tall trees as far as keeping the golfer honest.

How old is that key tree?

An important consideration regarding these very important trees guarding the elbow on dogleg holes are their age and general health and vigor.

It may surprise some of you to hear that trees have different life spans depending upon the particular genus or species. They certainly won't stand there forever. There are short-, medium-, and long-lived trees.

The Gray Birch (*Betula populifolia*) is a prime example of a short-lived tree (15 to 30 years). The Wild Cherry (*Prunus serotina*) might be a good example of a tree with medium life span (50 to 75 years). The Oaks and Beeches, of course, can easily go to 200 and more years in fine health. The extreme examples of longevity naturally would be the Redwoods, Giant Sequoias and the Bristlecone Pines of the West Coast areas and certain areas in the Rockies.

It is the short-lived trees that should concern us. Suppose, for example, on your course there was a Cutleg European White Birch (*Betula alba laciniata*) holding down the all important corner of a dogleg hole and the tree was at least 12 to 15 inches in diameter. Already you would have good reason to be worried. Rarely does this beautiful tree with its refined foliage, graceful weeping branches and spectacular white bark reach the age of 50 or 60 years. This represents its natural life span and very little can be done to alter this. The dogleg will be a pushover to the golfer until you rebuild a proper challenge in that area.

On the other hand, let us say you have a truly handsome Beech (*Fagus*)

standing guard at your elbow. It is already a hundred years old (Beeches can easily go to 200 or 300 years under proper growing conditions). One day you "look up" as we suggested in an earlier article, and you see dead branches at the top of this old standby! This may be the first sign of serious trouble setting in. It could be caused by a number of factors - poor drainage in the root zone, lack of proper nutrients, physical damage to the root system or even a lightning strike could cause this "stag heading".

Luckily, however, if the lightning strike was a cold bolt you could most likely, with proper action, restore the tree to good health. It could serve you well for an additional hundred years or more.

The reason for describing these possible situations is to be certain you are putting time and money into the best trees possible for such critical areas. The services of a specialist to make these selections would be well worth the cost.

Even the long-lived species of trees can be failures at a relatively young age if they were damaged and not given proper knowledgeable care.

Decay sets in to form cavities. If such cavities (or exposed heartwood areas that will turn into cavities) exist, then again a professional can tell you whether or not the tree is worth trying to save. If cavities are treated in a scientific manner before they get too large, the tree can rebuild itself into a perfectly strong specimen.

Protect that tree!

Lack of lightning protectors of key trees on golf courses always amazes us. Members almost give a feeling of being proud of the fact that "This stump is all that is left of a tree that was hit by lightning".

Some of these "remains" show annual rings of up to 150 years of age. What a pity they are not still guarding the joint on a dogleg hole as they were before. An eighty-foot giant perhaps 100 years old, can be destroyed in a split second. Such an unnecessary disaster could be prevented with some foresight and a few dollars. No amount of money can buy you an exact duplicate of such a majestic, natural work of art.

Tree selection a key factor

Many factors should be considered before you decide which tree or trees shall protect that bend in the dogleg hole.

Evergreen trees

If, for example, you want a visual screen of the dogleg for year-round play, then you select evergreen trees such as pines, spruces, firs, hemlocks, cryptomerias, etc. Such types will not add annual height as fast as deciduous trees. They will, however, create a hazard for the low, short shot in a shorter period of time. Any balls landing under or near them will most likely be difficult to hit even though the trees are only a few feet high.

One of the most useful evergreens on the golf course is the White Pines (*Pinus strobus*). They are all grown from seed and as such are subject to "seedling variations". Most of them will grow into typical White Pine shape. Some of them, however, will not fit the mold. Therefore, when selecting such an important tree be sure to choose specimens which have the true characteristics of the species.

They should start out with branches low to the ground. Once it is established, it will develop very obvious and attractive horizontal tiers of branches. Barring any mishap or insect attack, it should, in about 40 or 50 years, take an outline that would roughly fit into an upright rectangle. The proportion would be 2 or 3 units of height to each unit of width. This shape will fill a space of about 40 feet wide and 80+ feet high. This creates quite a formidable guard at the bend in any dogleg. Be sure to leave permanent orders not to cut off the lower branches. This kills off the true beauty of the pines as well as other conifers.

If ice or wind storms or heavy wet snow loads should damage such trees, don't be too dismayed. In just about every case the tree will become more picturesque as a result of such natural pruning action. Of course, prune off the stubs of such broken branches to a flush cut and its juncture with the parent branch.

Deciduous trees

Deciduous trees on the other hand have a very narrow trunk compared to its crown or head. Errant balls coming to rest in the vicinity of such young trees will usually be easily stroked out to the fairway with a minimum of trouble.

Whether you plant small, medium or large trees on a dogleg, you really should research the subject thoroughly. If you can afford a landscape architect, try to get one who not only plays golf but also is a student of the game. You must know the ul-



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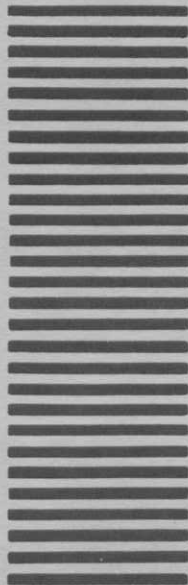
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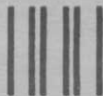
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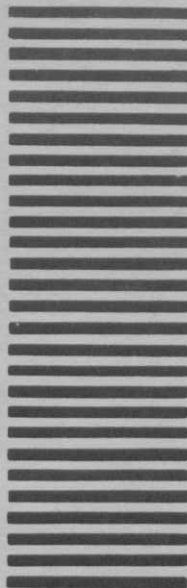
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timate structure of the trees in order to make it effective as a guardian of the dogleg. It also should be beautiful, long-lived, strong in structure and preferably a low maintenance tree.

To demonstrate the point, let us assume that you want a single key tree to ultimately dominate the turn itself.

A beech tree with its branches allowed to touch the ground would act almost as a solid barrier some day in the future. It would not only reach 60 to 70 feet into the air but it could spread to nearly the same dimensions in width. Also, the branching framework is very dense. Very few balls could find their way through it, even when the trees are only 20 years old.

On the other hand a tree such as an American Elm, Honeylocust, Chinese Scholartree, Hickory, Eucalyptus or Cottonwood would present a completely different situation. Such types will develop tall, clean boles (trunks) with outspreading branches and rather top heavy crowns. Already you can see how low hooked or sliced

shots could fly right under such trees as though they were not there. Also, the branching habit leaves a lot of air space between them for flying balls to clip right through unimpeded. Therefore, this type tree should be used mostly on doglegs where the distance from tee to the trees is in the area of 190 to 230 yards. They would be most effective against the long ball hitter who moved the ball a little too close.

These types of trees also allow a view under them to the rest of the hole. This fact alone often affects the psychology of play. If the golfer can see the green he is more apt to gamble to reach it than he would be if the view to the green were blocked.

A combination of deciduous and evergreen trees is usually the most natural and effective planting for a dogleg, where conditions permit.

These various examples should give you cause for careful thought before deciding on which trees to use. The deeper you look into the subject of trees, the more it becomes apparent that each genus and, many times, even

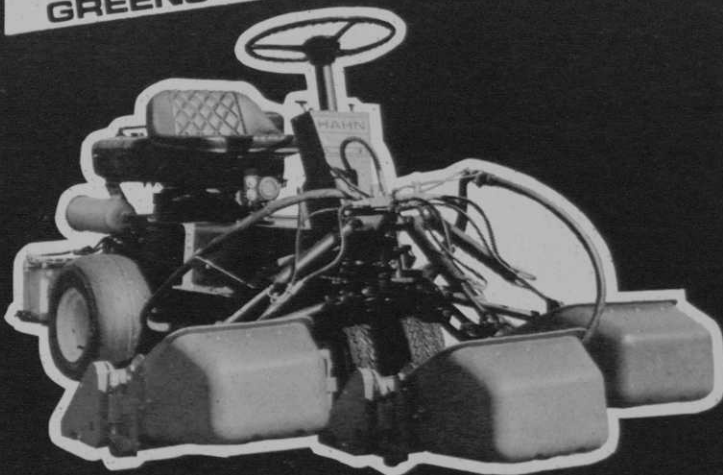
each species of the same tree have distinct characteristics of their own. It is the ability to employ such knowledge that will either make or break the dogleg. (No pun intended.)

We sincerely hope our readers do not get the impression, after reading this article, that we are a couple of sadists who enjoy making dogleg holes prepared traps to add strokes to the golfers score. (We play golf too.) What we are attempting to do is simply create an environment which will reward the good and penalize the poor golf shots. Anyone can meet total disaster on even a straight hole if he or she ignores the danger areas in the rough, water, under trees, etc. For some strange reason, however, the short cut across a dogleg seems to be the greatest temptation of all. As such, it must have its built-in penalties for those who have the courage to attempt it - but fail.

But no matter how well the dogleg is landscaped, there will always be a few who will attempt a short cut in hopes of saving one more stroke.

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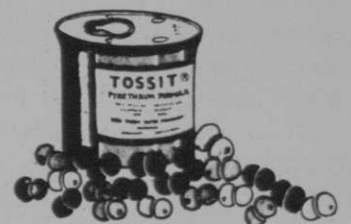
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Ornamental plant diseases and their control

by Roger Funk and Henry Gilbertson, Davey Horticultural Institute,
The Davey Tree Expert Company

An ornamental plant may be defined as diseased when its normal life processes are disrupted. These disruptions are caused by both parasitic (living) and non-parasitic agents.

Parasitic agents of ornamentals are principally fungi but also include bacteria, mycoplasmas and viruses.

Many parasitic plant diseases can be discussed according to the major part of the plant infected.

Leaf Diseases

Leaf Spot Diseases

Most deciduous ornamentals are subject to leaf diseases to some degree.

One of the most common types of disease is that caused by the leaf spot fungi. These fungi overwinter in the old leaves on the ground in the form of spores which become windborne during cool, wet spring weather. They produce diseased areas on the leaves which are more or less characteristic in size, shape and color for each species of fungus. Such descriptive common names as leaf blotch, tar spot and frog-eye leaf spot indicate the distinctive character of the injuries produced by many of these fungi. Some of the disease organisms are specific to a particular plant species; others may attack several species of trees or shrubs.

Leaf spot diseases are particularly noticeable when they cause premature leaf drop. However, partial defoliation is seldom serious unless it occurs two or more years in succession. These diseases do not directly kill trees but rather predispose them to other diseases or stresses which may lead to decline and death.

Most leaf diseases can be suppressed or prevented with fungicidal sprays applied at budbreak and repeated twice at 7-to-10-day intervals. In wet years, additional applications may be necessary. Raking and disposing of leaves to reduce the

sources of inoculum is effective only if practiced on a wide area basis. The amount removed at a single site would not significantly reduce the potential infection since the fungal spores are windblown over great distances. Proper fertilization, pruning and watering during droughts will not decrease fungal infection but will help the plant recover more quickly and remain vigorous.

Rust Diseases

That class of diseases known as rusts should be included in a discussion of leaf diseases since many of the rust fungi cause serious leaf problems.

The characteristics of rust diseases which sets them apart from the others is that most of the fungi that causes them require two hosts to complete the life cycles. In other words, the spores produced by a rust fungus on one kind of tree cannot reinfect the same kind of tree. Instead they must infect a second kind of tree or some other plant which is usually from an entirely different genus. The fungus then produces spores on the second host. These in turn cannot infect the second host but must return to the first kind of tree or plant to grow to complete the cycle. In some cases both hosts may be trees or other woody plants. In other cases one host is a tree and the other some herbaceous weed or crop plant. Both hosts of some rusts are herbaceous plants. Some of the serious diseases of branches as well as leaves of trees are caused by rust fungi. The cedar-apple rust, which is a common disease of apple trees and related ornamental species, may be considered as typical of the rust disease.

The most effective preventative measure for rust diseases would be to destroy the less desirable hosts within carrying distance of the spores. Unfortunately, this is seldom practical

Photographic guide to ornamental tree diseases

Beginning with the top row and proceeding from left to right, the photographs illustrate Apple scab on crab-apple; Cedar apple rust on hawthorn; and *Cytospora* canker on mountain-ash.

Proceeding from left to right on the bottom row: *Verticillium* wilt, showing streaking of sapwood; Wood rot and a shelf fungus associated with the wound; and Shoestring root rot showing rhizomorph fungus strands and whitish mycelial fan.

because of the long distance spores may travel. Properly timed fungicidal applications have successfully controlled most rust diseases on ornamentals.

Stem Disease

Canker Diseases

Canker diseases are common on many ornamental trees and shrubs. Some of the fungi which cause leaf



diseases also cause a killing-back of the twigs for some distance from the end. For example, the fungus which causes a typical leaf disease known as anthracnose of sycamore also causes a twig blight and canker stage on branches up to an inch in diameter. Other fungi causing similar twig symptoms may not directly affect the leaf tissue. Fungous injury on a trunk or branch becomes a canker when

destruction of bark is complete and a wound results. In most cases, the cankered area is sunken and/or discolored and may be covered with the fruiting bodies of the fungus.

An individual canker may continue to grow until it girdles a large branch or a fair sized tree. Numerous small cankers on a branch or trunk may result in the same girdling effect in less time. The damage is caused by the

fungus destroying the cambium and conducting tissues of the phloem and outer xylem or as a result of infection in the outdoor bark. This shuts off the supply of water and minerals to the top of the tree and prevents the downward flow of prepared food materials to the roots and other parts below the cankered area.

Cankers often go unnoticed until the infected stem dies and the foliage

