

The Right Tree in the Right Location

Understanding the origins of tree use on golf courses will help solve tree problems on your golf course.

BY DAVID A. OATIS

We climbed trees as youngsters and built forts in them. We enjoy their fruit, their foliage, and their fall color. We use their wood to build homes and furniture, and once upon a time their wood was even used to make golf clubs. So how can trees possibly be bad for golf courses? In order to gain a thorough understanding of the problems that trees pose to turf-grass and golf courses, it is important to understand a little about the history of golf in the United States and the history of tree usage on golf courses.

A SHORT HISTORY LESSON

Golf's popularity exploded in the early part of the 20th century, bringing to bear the golden age of architecture from 1910 to 1937. Surprisingly, many early golf courses had very few trees on them. There were a variety of reasons for this, and the first is a practical one. Early golf courses frequently were built on old farms because the land was already cleared. Clearing trees was an expensive, labor-intensive, and time-consuming enterprise, so avoiding this expensive roadblock helped control costs. Secondly, and perhaps even more important, many early golf course architects did not believe that trees belonged on golf courses. Most of the early architects came from Europe or learned their craft there, so their experience was primarily with links courses, which generally are devoid of trees.

Several famous golf course architects commented or wrote about trees. The following A. W. Tillinghast quote, from the book titled *The Course Beautiful*, encapsulates his opinion of trees used as backdrops behind greens: "... in the case of a green played directly beyond the slope of a hillock and sharply defined against the sky. Barren of any nearby object, such as a tree for instance, the distance of



The difference in a golfer's perceived difficulty of a golf hole with and without a backdrop of trees is remarkable. Once a backdrop is removed, a green looks smaller, the topography comes alive and the hole looks much more challenging.





The unnatural tree line on the left side of this hole was added years after the course was built. It effectively shifted the center of the fairway to the right by 10-15 yards, it looks odd, and it penalizes a well-struck drive. More important, it influences play to the right towards an adjacent tee. If trees are to be used on the left side of this golf hole, they should be well left of their current location.

the shot to the green is much more difficult to judge with accuracy than it would were there a tree or two standing forth. All players of ability will bear witness to the baffling length to a naked green, but few actually realize how much more readily the estimate of the eye would be flashed to the brain if sight should fall simultaneously on a lone tree and its neighboring green." Isn't it ironic that golfers still claim to need a backdrop when yardage aids now are so common?

Other architects stated their feelings more bluntly. Walter Travis flatly stated that "trees have no place on a golf course," while Harry Colt called them "fluky and unfair hazards." Then there was Max Behr, who stated, "It goes without saying that trees lined to hem in fairways are not only an insult to golf architecture, but the death warrant to the high art of natural landscape

gardening, aside for the fact that, of all hazards, they are the most unfair." Alister MacKenzie also fell into the camp of architects who held no great love of trees: "Playing down fairways bordered by straight lines of trees is not only unartistic but makes tedious and uninteresting golf. Many green committees ruin one's handiwork by planting trees like rows of soldiers along the borders of the fairways." To be fair, not all architects disliked trees, and some gradually began to accept them later in their careers. In a 1927 issue of *The Bulletin of the United States Golf Association Green Section*, William S. Flynn wrote, "Today the old ideas have been discarded and the prevailing belief is that trees, most emphatically, have a fixed place on a golf course."

With such an inauspicious beginning, it is curious that trees have become

such an integral part of so many golf courses and that golfers have so highly prized them for years. In the 1920s, 1930s, and 1940s golfers and course officials wrote many articles for *The Bulletin of the United States Golf Association Green Section* extolling the virtues of planting trees and shrubs along fairway corridors and around putting greens to "frame" them. Some of these articles described early golf courses as being "barren." Other articles suggested that golfers would enjoy tree plantings and that their beauty might take golfers' minds off poorly played golf shots. Others advocated the planting of fast-growing trees, possibly mixed with slower-growing trees, to achieve quicker effects. Others advocated planting evergreens to avoid the expense and annoyance of removing leaves in the fall. Many addressed the beauty of

nature and the importance of adding trees and ornamental plantings for aesthetics. Few if any articles addressed the need or desire for tree removal.

there was conflict regarding trees from golf's earliest days.

It was acknowledged early on that turfgrass shaded by trees struggled, and that certain turfgrass species were

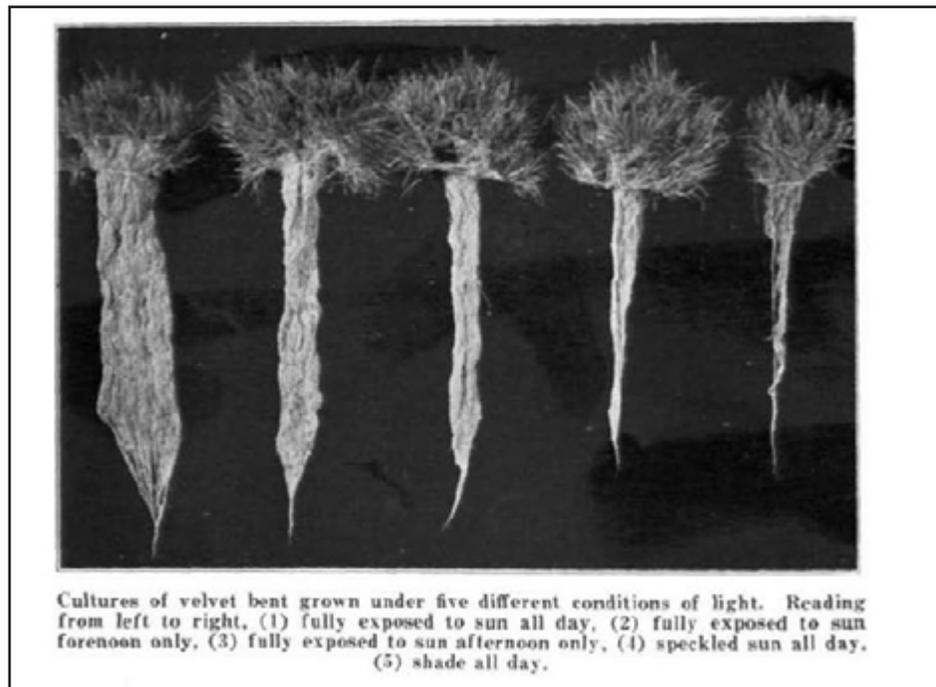
believe that trees were a hallmark of fine golf courses and fine golf holes. As a youngster cleaning clubs at a golf course in the late 1960s, I recall an adult golfer referring to another local course in a snobbish, derogatory manner, stating that it "looks like a public golf course because it doesn't have any trees."

WHAT WENT WRONG?

One key historical event — thousands of American elm trees dying from Dutch elm disease in the 1960s and 70s — probably fueled the problem. In response to the devastating tree loss, some panicked and rapidly filled the voids left in tree stands with fast-growing tree species. In an attempt to have the greatest impact in the least amount of time, often more trees were planted — often in areas closer to play — than were removed. However, no other species has the same high arching, vase shape of the American elm, so many of the replacement trees ended encroaching on playing corridors.

Given the background of early golf course architects, I believe it was their intent to build a single large landscape with 18 different trails running through it. Golfers and course officials sought to split the single large landscape into 18 separate smaller ones and in so doing created a host of problems that would take decades to fully realize. The most basic mistake was that golf, course architecture, strategy, and turfgrass health all took a back seat to the importance of planting trees and ornamentals.

- At some courses, every open location became a potential planting site, and trees were often planted with no purpose other than to fill voids. The goal frequently was to line every fairway and surround every green with trees.
- The original architectural design intent was forgotten or ignored, as was the value of having open views and vistas. The appreciation of interesting topography and its impact on aesthetics, playability, and strategy likewise was disregarded.
- Far too many trees were planted. Furthermore, trees often were



It seems safe to assume that the research conducted in 1933 documenting the effects of sunlight on turfgrass root growth did little to reign in the burgeoning tree planting programs!

Thus, many well-intentioned course officials made it their mission to fill golf courses with trees and ornamental plantings, despite the fact that early golf course architects held little love for them. A. W. Tillinghast commented on the tree-loving passion some golfers displayed: "... probably none is better qualified than myself to speak of the sentiment of American golfers generally concerning trees on the golf course. I find that our citizenry, throughout the land, are tree lovers. As a matter of fact they are so violent in this adoration that they 'get in my hair,' for as much as I like trees myself I am not above sacrificing a few every now and then if it is the only way to salvage a golf hole. . . . I sometimes take my very life in my hands when I suggest that a certain tree happens to be spoiling a pretty good hole. The green committee chairman is like as not to glare at me as though I had recommended that he go home and murder his wife." Clearly,

better suited to treed areas. It also was assumed that water was part of the problem as it was noted that turf under trees was drier than turf growing in open environments. A USGA study conducted in 1933 showed that shade has a significant effect on both root and shoot growth of turfgrass. However, the negative effects trees have on turf did not seem to attract much attention during the early part of the century, and golfers' strong desire to plant trees and "beautify" golf courses won out over the protestations of golf course architects. Many courses created "tree" or "course beautification" committees whose specific mission it was to plant trees, and golf courses everywhere were methodically planted with trees and ornamentals.

In addition to turfgrass health and playability, it appears that the importance of trees also superseded the importance of course architecture. Eventually, many golfers came to

placed so close together that they completely shaded turf areas and, as the trees grew, they also began to compete with one another.

- Trees were planted far too close to playing corridors and their eventual size and canopy shape often was underestimated.
- Tree plantings often were arranged unnaturally in straight lines, gentle symmetric curves or other unnatural geometric shapes.
- Many different tree species were used, greatly benefiting landscape diversity. However, key characteristics of trees pertaining to their compatibility with turf, playability, and maintenance were not considered, and many of the commonly planted tree species were prone to surface rooting, were fast growers and had soft wood, produced objectionable debris — e.g., leaves, fruit, bark, etc. — or had dense, low-branching habits that made them ill-suited for use in fine turf and in-play areas. Other poor choices included selecting tree species that are short-lived or prone to pests and diseases.
- Not all of the trees were intentionally planted. At some courses, rough mowing was reduced due to labor and financial constraints and unmown areas gradually reverted to woodlands. Telltale characteristics of these areas are trees of the same general age and large populations of pioneer tree species.
- Tree populations, which evolve more rapidly than most other golf course components, often went unmanaged. Courses that did have tree-management programs mostly concentrated on corrective pruning, fertility, pest control, and still more planting. Shockingly, some golf courses had tree nurseries but did not maintain putting green nurseries.

It is important to note that golf courses are ideal sites for tree growth and development. The water and fertilizer that regularly are applied to maintain turfgrass often benefit trees just as much or more than the turf. Because of this, and partially due to the lack of competition from other vegetation, the growth rate of trees on golf courses is nearly double what

it would be in a natural forest environment.

The effects of tree root systems, which vary with tree species, also were not thoroughly understood. Some species have tap roots, whereas others have fibrous root systems. Furthermore, tree roots usually extend far past the drip line, extending outward one or more times a tree's height, depending on the species. Thus, tree roots have access to a large reservoir of moisture and nutrients, allowing trees to effectively compete against turf for these resources. Ultimately, tree root systems can have a significant impact on turf.

Even with ideal conditions, trees grow slowly. Usually, the decrease in sunlight penetration and air circulation from a few years' growth is not very significant. However, over a longer period of time — i.e., 25-50 years or more — tree growth can have an extraordinary impact on turf health, playability, and aesthetics. Consequently, views and vistas slowly were consumed while playability and aesthetics are reduced by maturing stands of trees. In many cases, clubhouses that purposely were placed on a hill to look out over a golf course

gradually lost sight of the course as trees grew. However, properly located trees of desirable species often developed into specimen trees that enhanced aesthetics and playability, with minimal negative impact on turf. Unfortunately, vast numbers of trees were poorly planted — often too close together — leading to stunted, deformed specimens that were unable to reach their full genetic potential.

The impact trees had on playability was even more severe. Bunkers often were surrounded with trees, reducing their intended visual effect and making recovery nearly impossible. Trees that obscure obstacles, hazards, and intricate topography of key architectural features hide the vital design elements that make golf holes memorable and instill uncertainty and fear in golfers' minds. For example, hiding a pond or stream behind trees reduces its strategic impact while making it much less visually intimidating.

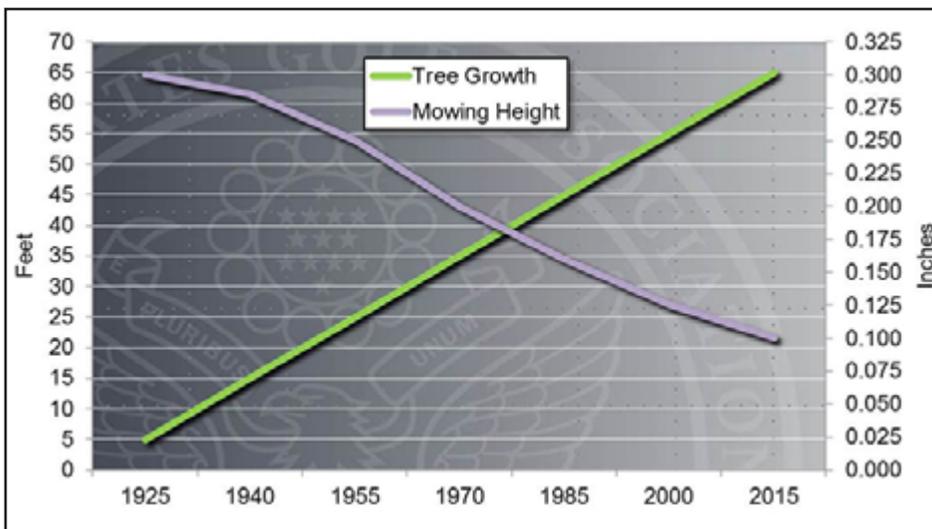
Poorly located trees forced golf holes out of alignment by narrowing playing corridors and reducing lines of play. Golf holes that were originally intended to provide golfers with multiple lines of play became so choked with trees that often only one option



There are few things more majestic than a properly located, stand-alone specimen tree. It is remarkable what a small tree can become with care and foresight.



Trees that block advancement from a bunker doubly penalize a miss-hit shot and are termed “double hazards.” For most, golf is a difficult enough game and to penalize a wayward shot so severely just adds insult to injury.



For many courses that over-planted trees in the 1920s and 1930s, tree growth corresponded with the lowering of turfgrass cutting heights over time. Ultimately, as those courses matured, tree growth and cutting height converged sometime around the 1980s, signaling a dramatic increase in tree-related turf and playability problems. This graph estimates this phenomenon.

remained. Perhaps most significantly, courses that implemented extensive tree-planting programs created situations where offline shots were severely punished and recovery options were eliminated or greatly diminished. It seems the goal of some tree programs was to thoroughly punish every offline shot by preventing all recovery shots toward the green.

The prospect of removing a tree that is 20 yards deep in the rough is often debated during Course Consulting Service visits. Course officials frequently argue that removing the tree “creates an open shot to the green.” The counter argument is, “Can a golfer who just missed the center of the fairway by 25-40 yards now miraculously laser a shot to the green?” While a recovery shot certainly is possible, it still isn’t likely after the tree is removed. More important, shouldn’t the player who hits an errant shot have a chance at redemption? How boring it is to find every single offline shot so severely penalized.

Open, rolling topography may look barren to some, but just as there is abundant life in a desert, there is much for golfers to observe and appreciate in an open golf landscape. Intricately designed putting green and bunker complexes are a prime example. Trees that surround a green shrink a golfer’s perceived size of the landscape so the green actually looks larger than it is. Conversely, the same green without a backdrop of trees looks much smaller because a golfer’s perceived size of the landscape is much larger. Eliminating a backdrop of trees can increase the psychological difficulty of a golf hole. Placing trees further away from greens also helps highlight topography and other strategic features, like bunkers, often causing them to look more intimidating. For years, golfers did not attach appropriate importance to the visual effects of topography and openness on playability.

In short, at courses where indiscriminate tree planting occurred, designs that had once encouraged thoughtful, imaginative play were gradually transformed into one-dimensional, penal designs; courses that once felt expansive were transformed to small-feeling,

claustrophobic golf courses. But watching trees grow is like watching a clock, so their impact went unnoticed for years.

Another curious event occurred while the trees were growing: Turf-grass cutting heights steadily were lowered on greens, tees, and fairways. The perceived importance of putting green speed escalated with the introduction of the USGA Stimpmeter in 1978, so as the trees gradually grew taller, the cutting heights got lower, dramatically increasing stress levels on turf. At many golf courses, the lines on the graph of tree growth and cutting heights began to converge in the 1980s.

AN AWAKENING

USGA agronomists and other experts began to identify and discuss golf course tree problems in the 1980s, but convincing courses to remove trees was an uphill battle, given golfers' love affair with trees. Success required that long-held beliefs about the importance of trees and their impact on playability and course difficulty be countered, and golfers' innate love of trees often brought into play a strong dose of emotion. As trees on golf courses continued to grow and cutting heights continued to get lower, problems with turf health and playability became epidemic in the 1990s and 2000s. Exacerbated by golfer demands for better turf and playability, many courses simply could not sustain reasonable turf health and playability. Turf loss as a result of inferior growing environments became commonplace. Trees also had a major impact on maintenance budgets, though their effects were not recognized until much later.

USGA agronomists began helping courses develop tree-management programs in the late 1980s, and many articles were written and presentations were made on the subject. The path to helping courses identify and solve tree problems was paved by education. Courses began to address tree problems, but only grudgingly at first. Many golfers feared that removing trees would make their courses "too easy" and look barren. Many golf courses



Bermudagrass performs poorly in shade and is much more susceptible to wear injury and winter damage in the absence of sufficient sunlight.

initially took baby steps by removing 10-20 trees or so per year. This made it feel as though progress was being made, but for courses that had implemented successful tree-planting programs, removing only 10-20 trees had little impact on the overall problem.

Due to extensive tree-planting programs and years of growth, massive tree-removal programs were necessary at many golf courses. Fortunately, golfers' tolerance of removing trees increased with the identification of tree problems and the recognized benefits of the solutions. As each story unfolded of how courses dealt aggressively and successfully with tree work, it became easier to convince other courses of the need for tree work. The realization and understanding of necessary corrective actions was aided greatly when well-known and highly rated courses embarked upon extensive tree-management programs. It helped even more when their rankings improved as a result of the work.

COMING FULL CIRCLE

There is no denying that trees can serve many valuable functions on golf courses and, when used appropriately and in moderation, they can be used to

great benefit. From an environmental standpoint, trees effectively sequester carbon while providing food, cover, and habitat for wildlife. From a practical standpoint, trees are valuable for screening unwanted views and can provide separation where needed. Aesthetically, the natural beauty of a specimen tree offers extraordinary appeal, and the rugged beauty of a craggy, storm-scarred old tree can have an incomparable naturalizing effect. Massed tree plantings also have a place, but the stand-alone specimen trees are the trees that make the most striking visual impact. Trees also can be used to impart strategy; however, it is dangerous to build golf holes around individual trees because they are temporal — one severe storm or a single bolt of lightning can undo a century or more of growth, potentially stripping a hole of its defense in a flash.

It is important to remember that trees are stealthy thieves. When budgeting, most only consider the cost of purchasing and planting trees, which usually is the least expensive portion of a long-term enterprise. Planting a single tree starts a chain reaction of expenses that can absorb resources

for 50 or 100 years or more. Multiply those expenses by the number of trees — 100, 1,000, or 10,000 — and trees can become a large and very long-term financial commitment. (See Oatis, David A. “[The Hidden Cost Of Trees](#).” *The USGA Green Section Record* May-June (2010): 4-8. *TGIF*. Web.)

TREE MANAGEMENT

Perhaps the most significant point to remember is that tree populations require management, and while trees can be pleasing and useful additions to a golf course, they are not an essential component of all courses. Thus, individual trees should be evaluated pragmatically and without emotion, based on specific criteria (See Oatis, David A. “[Man’s Friend Or Golf’s Enemy?](#)” *The USGA Green Section Record* July-August (2000): 1-6. *TGIF*. Web.), the most important of which are their impact on turf health, reliability, and playability. When reviewing particularly controversial trees, it is helpful to ask the question, “If there were no tree there now, would you add one?” In many cases, the answer is an emphatic, “No.”

Similar criteria should apply to proposed new plantings in order to

avoid repeating past mistakes. Remember, trees that have little impact on play as saplings may narrow golf holes and block shots from teeing grounds or around greens once they mature. If new plantings immediately come into play, they may be in the wrong location long term. When trees are removed, avoid the all-too-common mistake of rushing to immediately replace them. Areas of golf courses are visually transformed when old trees are removed, and it can take time for golfers to become accustomed to the more open look. Waiting a year before deciding whether or not to replace trees is an excellent policy.

It must also be recognized that trees can present a liability issue for golf courses when they are not properly maintained. Admittedly, perfectly healthy, sound trees can fail without warning, but structurally unsound trees that pose an obvious liability should be removed.

The list of golf courses that now have implemented tree-management programs is a long one, but it is a mistake to think that a program, once implemented, is finished. Trees are constantly evolving and adjustments and updates to management plans should be made regularly. Some golf

courses take a particularly organized approach and develop tree inventories so as to better track the health, diversity, age, and projected life span of their trees. Trees can disrupt golf and interfere with turf health in many different ways. Here are a few critical points to keep in mind as you consider existing and proposed tree plantings on your golf course:

LOCATION, LOCATION, LOCATION

There are many criteria to consider when evaluating tree plantings, but the most important is location. Tree canopies shade turf, reducing its vigor. Tree canopies also can block air circulation, increasing disease pressure and reducing turf’s ability to cool itself. Turf that does not receive adequate light and air movement is less vigorous and more susceptible to stress, traffic injury, and disease. Adding insult to injury, reduced light also limits turf’s ability to recover when problems occur. Furthermore, tree root systems compete with turf for moisture and nutrients. Trees also have a significant impact on traffic flow, as their physical presence funnels traffic. When concentrated traffic, shade, root competition, and poor air circulation all are combined, it usually proves lethal to turf.

Complicating shade issues, the position of the sun in the sky — and likewise the shade pattern cast by trees — dramatically changes throughout the year. Sun angles must be carefully accounted for to accurately assess the impact of shade from trees on specific turf areas. You may be surprised to know that shade is even important during the winter when turf is dormant. There is a strong correlation between winter shade and winter injury for both warm- and cool-season turf. Unquestionably, growing environment has a bigger impact on turf performance than virtually any other factor. Trees in the wrong location can have disastrous effects on turf performance.

ALL TREES ARE NOT CREATED EQUAL

There are both appropriate and inappropriate tree species for use on golf courses and in fine turf areas, so



Some tree species have extremely aggressive root systems. Above-ground surface roots are a menace to maintenance equipment, golf carts, and golfers.



Competition between trees is an often overlooked fact of nature. The terrific quality sugar maple on the right will be ruined if the more recently planted locust on the left is not removed. The choice is simply a matter of quality vs. quantity. Unfortunately, all too often quantity wins.

choose tree species wisely when developing a tree-management program for a specific location. There always are exceptions, but usually it is wise to rely on tree species that are indigenous to your geographic area because they are more likely to perform well. Observing which tree species are performing well on your course or in the surrounding area also can provide valuable clues as to what trees might be successfully used at your facility. It is extremely important to consider longevity, diversity, and susceptibility to disease and insect pests when selecting tree species. Major pest or disease outbreaks can occur with little warning, severely affecting susceptible tree species. Dutch elm disease decimated American elm tree populations years ago, and golf courses and communities that had large populations of American elms were devastated. Similar effects

now are being experienced in areas where ash trees are heavily utilized, due to the impact of the emerald ash borer. Pest outbreaks can be devastating where tree populations lack diversity. Having species with varying potential life spans also can be beneficial, but avoiding short-lived tree species makes sense in most situations.

Species with aggressive surface roots make for poor playability and can be damaging to golfers, golf carts, and course maintenance equipment. Fast-growing species generally have softer wood, may sucker when damaged or pruned, and are more susceptible to storm and wind damage. Trees with thorns can cause physical injury to golfers and maintenance staff, and they can puncture tires on golf carts and maintenance equipment.

Some species are notoriously messy — dropping leaves, branches,

fruit, and bark — so it also is important to consider the debris factor and tree placement during the evaluation process. Messy trees in out-of-play areas may not be an issue, but when they are located near tees, greens, fairways, or bunkers, they can annoy golfers and increase maintenance costs. Branching habit is another critical factor to consider. Trees with low branching habits may be ideal for screening but, for a golf ball that comes to rest under one, they pose a severe and indiscriminate penalty from which there is no reward for a skillful recovery shot. Both expert and novice golfers are left to take an unplayable lie or try to hack their ball back into play from under low-branching trees. Neither option requires extraordinary skill. When located in in-play areas, trees with low branching habits are extremely penal; hence they are best left for periphery plantings.

DECISIONS, DECISIONS

Golf courses that have trees must manage them to safeguard their investment in both trees and turf. Proper tree management will ensure that trees remain assets that enhance a golf course rather than liabilities that threaten it. Plenty of decisions about trees on golf courses are relatively easy, such as the decision to remove a diseased, structurally damaged tree that is located in a high-traffic area and shading a putting green. Other decisions are extremely complex because they require the knowledge and imagination to envision how trees will grow and develop and what their impact on turf health, aesthetics, and playability eventually will be. It is the rare individual who has an in-depth knowledge of trees, insect pests and diseases, sun position angles, turf-grass requirements, and golf course architecture and playability; however, this is the knowledge required to effectively and knowledgeably evaluate golf course tree populations, solve current tree issues, and prevent future tree problems. USGA Green Section agronomists have training in all of these areas and are well equipped to assist courses with developing tree-management programs. Other options

include engaging consultants who have specific knowledge in each of the appropriate areas. It is a good practice to involve a competent golf course architect to aid decisions affecting playability and architectural issues.

Tree-management programs invariably involve removing trees, but planting better-adapted, more appropriate trees also is an important part of many tree-management programs. For instance, in locations where screening or separation is desired, it may be wise to add new trees as old ones decline. It may even be necessary to remove healthy trees to maintain adequate separation while also maintaining good tree spacing. The goal of an effective tree-management program should be to continually improve and upgrade tree quality. Many of today's tree problems could have been avoided if courses concentrated more on tree quality than on tree quantity.

Tree populations are extremely dynamic, and if trees are an important and desired component of your golf course, developing and continually updating a tree-management program is critical for long-term success. Just keep in mind that trees are not appropriate on all golf courses or in all locations. Furthermore, it is easy to plant a tree; almost anyone can do it. Although dangerous, also just about anyone can cut a tree down. The trick is to plant the right tree in the right location so that it adds to aesthetics and the golf experience without detracting from turf quality, playability, or the bottom line. Remember, trees are not valuable just because they are trees; trees are valuable based on their species, health, form, structure, location, and function.

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