TREES vs. TURF

Manage the trees on the golf course to provide healthier turf.

by JACK SWAYZE

Pruning tree roots and installing a bio-barrier prevent future tree root encroachment into the green.

TO A GOLFER, few things are as satisfying as playing a good game of golf on a picturesque golf course. Not only do players come to a course for the sport of the game, but also to appreciate the calming beauty that a golf course can offer. To drive a ball down a fairway lined with mature trees is just about as good as it gets.

Besides defining the fairways and adding character to a golf course, trees provide shade for player comfort and a degree of safety from errant golf shots. From an architectural standpoint, trees are incorporated into a design as strategic play elements. For example, trees are used to help indicate the course routing by creating the dogleg holes.

Overplanting Trees

Although an abundance of trees may at first seem like a positive attribute, too many trees can cause problems. Tree overcrowding is a common occurrence on golf courses for several reasons. Many times trees are planted for "instant gratification" without thought of their coverage once they have matured. Also, overcrowding is commonplace on older golf courses where additional trees have been planted each year. At times, the number of trees planted is increased to compensate for the lack of tree size. If these trees are not thinned out at a later time, overcrowding and distorted growth can occur. Numerous tree and turf problems are self-inflicted due to a lack of understanding or inadequate planning. This snowball effect eventually leads to more tree overcrowding.

Likewise, in an effort to use every existing tree, new golf course construction projects with native stands of trees are also likely to be overcrowded from the very start. As would be expected, the turfgrass grow-in is substantially slower due to the shade.

Conversely, many trees die as a result of golf course construction when grade changes occur from cut and fill. Unfortunately, many of these trees may have had strategic value and will have to be replaced. Better planning in the beginning stages may have saved them.

Aerial photographs depict a different perspective of the trees that line a course. As time passes, the trees grow larger to the point that they can affect play. Meanwhile, misinformed committee members continue to plant more trees as future replacements. The net result is overcrowding with too much vegetation. This heavy vegetation then creates challenges for successful turf management. Poor turf quality arises because the trees have a competitive advantage over the turf.

Tree Problems

Trees can present a competition problem in the turfgrass growing environment. Many species of trees have root systems that can extend outward two to three times the height of the tree. Since the majority of the tree feeder roots are in direct competition with the turf within the top foot of the soil, the trees rob vital nutrients and water from the turf. In addition, the tree canopies physically reduce or block air movement, which can lead to increased disease and algae pressure. Oxygen is a single limiting factor for root depth.

Due to their genetic code, trees grow larger than turf and develop a much larger root system that can extend great distances. Tree roots will invade greens, tees, fairways, and bunkers, given the opportunity, and can grow at a rate of more than six feet in distance per year. Large trees can easily have a root system covering more than an acre and often extending well into your managed turf.

Many times, tree species are planted that are not appropriate for use on golf courses. Some species have dense canopies of foliage with low branches. This makes it impossible to grow healthy turf because of insufficient available light, and it is difficult to mow under the trees. Other trees have shallow or surface rooting characteristics that can be a safety hazard to a player if he hits the root while making a shot. These shallow-rooted trees also damage mowers with their exposed roots.

Some trees are extremely messy with fruit or exfoliating bark. Oftentimes, trees will drop cones or pods that can wedge into the rollers of mowers, producing a poor quality of cut. Obviously, this requires increased labor that could be better appropriated to maintaining turf instead of tree cleanup.

Tree Maintenance

Physiologically, trees function the same as turf. However, they do differ because trees have woody tissue connecting the root system and the canopy. The trunk and limbs that form the canopy continue to grow into the shape

and form dictated by its genetic code and in consideration of available sunlight and other site conditions. Just like turf, trees will respond to good care. Their requirements for water, nutrients, and oxygen are the same as turf, and they are opportunistic. The cultural practices that are required to maintain healthy turf are similar for trees: regularly scheduled fertilizer applications, watering practices based on the evapotranspiration (ET), and aeration completed several times per year.

Managing trees on the golf course should be for agronomic benefit as well as for aesthetics. Too often, golf course tree management falls solely into the aesthetic category because the overall benefits are not well understood. Understanding the competition that exists between trees is essential. The trees compete with each other for the same needed elements; the strong survive and grow, and the weak trees die.

There is a strong argument that fewer trees may be better not only for the golf course turf, but also for the remaining trees on the golf course. Fewer trees obviously require less maintenance and often can provide the same strategic golf value with a proportionately less negative impact on the turf. Fewer trees also require less water if the overall tree biomass is less.

Water Requirements

Like turf, tree water requirements are dictated by leaf surface area. The more area, the more water is required to sustain the plant. Temperature, wind, humidity, sunlight, exposure, and season also affect water usage by increasing evapotranspiration. Obviously, dormant turf or trees require less water. ET is calculated similarly for trees as for turf, except that the trees' leaf surface area is proportionately greater and is more exposed due to height. Annual growth results in more canopy each year. More tree growth means that more water is required. Localized dry spots in the turf show up easily during the hot summer months and are very often tree related.

Small seedlings or small container trees may require only a few gallons of water per day for survival or growth. Conversely, large trees may require hundreds to more than a thousand gallons per day depending on the ET rate. Multiply the number of trees on your course by the average gallons needed per tree per day. You may be surprised at the enormous amount of water needed to support the needs of the trees in addition to the needs of the turf.

Developing a Tree Inventory

A sound approach for managing trees on the golf course is to develop a comprehensive tree management plan. It should take into account the agronomic issues of the turf as well as those of the trees. A tree inventory is an excellent starting point that will evaluate your important trees and create a location map and a corresponding database of tree management information. With today's use of Global Positioning System (GPS) and Geographical Information Systems (GIS) technology, the creation of accurate site maps has become greatly simplified.

The tree management plan should be targeted as a long-term goal. If water conservation is an issue, then the tree management plan should address this goal. Emphasis would then be on strategic removals and pruning to reduce the water requirements for the trees. The plan should also include suggested removals, pruning, and other special arboricultural needs, as well as help establish priorities and develop budgets. Safety and liability issues should also be noted and addressed. Courses that have implemented sound tree management programs have seen value-added results with immediate improvements in their turf and playability. The aesthetic improvements can be dramatic, too!

A Working Model

BraeBurn Country Club, in Houston, Texas, initiated a comprehensive tree management program in 1999 with dramatic results. First, aerial photographs of the golf course were digitized so that all of the course features could be recognized. Second, information was collected regarding each tree on each golf hole. For example, tree caliper, species, current health, and recommendations for improvement were coded into a hole-by-hole analysis workbook. Third, a group comprised of the Green Committee, superintendent, general manager, and myself initiated a pilot program to show the general membership what all would be involved. Trees were trimmed, moved, and removed on three holes. This process took approximately one month from start to finish. Shortly after the project was finished, 70 mph winds ripped through Houston and damaged trees and numerous golf courses in the area. Oddly enough, the trees that had been trimmed on the three holes at BraeBurn Country Club suffered no damage as compared to the trees on the rest of the property. The general membership was surprised to see that the tree management program actually helped save essential trees. Consequently, the club funded the tree management plan for the rest of the facility.

Conclusions

After developing a golf course tree management program, a golf course tree-planting plan can be designed with an emphasis on "the right tree in the right place." Tree species selection should be made based on what is appropriate for golf playability, turf quality, and turf and tree maintenance. Tree planting plans are also great for developing memorial tree programs, if they are properly planned and managed. The plan will help direct future tree planting on the course and ensure that your turf management programs and playability are not compromised with an incorrect tree species being introduced or planted in the wrong location.

Many turf problems and playability issues can be alleviated if proper planning and/or planting takes place. A better understanding of trees (including growth potential and maintenance requirements) and their relationships to turf can greatly impact and improve future turf quality, and can help reduce turf maintenance costs for the future.

All too often, course officials throw money at problems in an effort to correct the situation. Unfortunately, the symptoms are treated rather than the problem being solved. Implementing a good tree management program can help pinpoint the problems and provide cost-effective solutions for improving the turf as well as the trees. Trees are a very large and dominating part of the golf course ecosystem. Both trees and turf require sound management practices in order to optimize playing conditions. Incorporating tree management as a vital constituent of your course management program will help ensure better playability and healthier turf.

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