This is a time-elapsed photo showing the sun's position throughout the year at 8:30 a.m.
It demonstrates the need to take into consideration the sun's position during the growing season.

The Ace in the Hole:
Bringing Sanity to the Greens

Bob Christensen
ArborCom Technologies

People have had a long-standing love for the game of golf. The attraction of the greens and fairways is irresistible to so many. Walking the course, enjoying the scenery, or making a good score are all part of the draw that keeps so many coming back to the great clubs and courses. There remains, however, an ongoing problem for those who must manage these courses: balancing the aesthetics of many trees with the demanding needs of top-quality turfgrass. Much misunderstanding exists on the parts of those who make critical decisions on golf courses as to the removal and pruning of trees to allow maximum light exposure. This is where the golf course superintendent finds his calling—making trees and golf course turfgrass compatible.

Agronomists have long recognized the importance of light as a key growth factor for a number of plant species and have attempted to maximize its effect, largely for commercial reasons. One group that increasingly finds it difficult to balance the light requirements of plants with the need for trees is golf course superintendents. These skilled professionals find themselves in a challenging situation in attempting to balance the need for trees on golf greens for depth perception for the golfers with the need of the turf on golf greens to have large, extended amounts of direct sunlight. Many golf courses are placed in heavily wooded areas, and decision-makers at these courses want to retain the existing trees while, at the same time, maintaining healthy, vigorous turfgrass. Much of the leaf surface is maintained at a short height making it even more difficult for the greens to gather the required amount of direct sunlight.

The challenge becomes removing only those trees that directly hinder the penetration of light to the green without aesthet-

ically affecting the green or making a major impact on the playability of the course. If we are to prune only those limbs or trees that are blocking the sun, we need to know exactly where the sun is. Though multiple methods have been used through the years, with varying degrees of success, a new technology is making this task into an exact science with a user-friendly, highly applicable tool.

Putting this technology to work can produce impressive results. It minimizes the impact, aesthetically, on the trees involved in many of situations, including recreational areas, residential lighting needs, gardening requirements, in addition to golf course needs.

Complex astronomic algorithms take into consideration all of the factors influencing sun position. These algorithms can output exact quadrants that can be translated into a position by a sun location instrument. A computer generates the sun's coordinates in one-minute increments for every day of the year for a given geographic location. These coordinates are computed on site and are recomputed for each individual course. The sun location equipment is then set up in the shadiest portion of the turf area in question. Coordinates for a chosen time and day are entered into the equipment, which then indicates the position of the sun. By inputting multiple dates and times, sunlight and shade patterns can then be computed for various time periods throughout the year with equal accuracy.

Edgewood Valley Country Club had five greens and one tee deck where light was believed to be a limiting factor. Ron McCarthy, the club's superintendent, and a USGA consultant

EXACT SUN POSITION JUNE 20 1998 11:28 A.M.

New technology allows the consultant to go onto a golf green in January and determine the position of the center of the sun in June within 1/16 in. at 200 ft. from the sun location instrument.

identified light as the limiting factor on these areas. Realizing that he needed hard data to make good recommendations, McCarthy hired ArborCom Technologies to do three major tasks. The first task was to show exactly how much light the green and tee decks were getting May through October. The second was to provide recommendations on how to improve the light so the greens

and tees would get eight hours of direct sunlight per day with as much light as possible in the morning. Finally, ArborCom was asked to prepare a presentation that communicated the findings, using digital photos and charts to the Green Committee so they could approve the removal or pruning of trees, as required, to get more light penetration.

As the one given the responsibility for insuring playable, quality turfgrass and visually pleasing surroundings, McCarthy faced huge communication challenges when he realized that there were certain trees bordering the greens that were blocking an enormous amount of light yet adding little to the course strategically or aesthetically when it came to the light needs of the turfgrass. The main obstacle was, as is so often the case, a great reluctance to remove any trees, or parts thereof, along the golf course. People's affinity with trees is just so strong. Also making things difficult was having to potentially guess, albeit an "educated guess," which trees or limbs to remove. That reduced McCarthy's bargaining power with the Green Committee to the "not very convincing" level.

It was for these reasons Ron McCarthy decided to call in sun-location consultants from ArborCom Technologies to utilize their technology to ascertain precisely how much and when light was reaching the trouble spots, thus enabling scientifically-backed recommendations for specific tree removal. Putting the challenges into perspective, McCarthy explained that easily fifty percent of the golfers are not low-handicap golfers. As such, they are there to get out of the cities and enjoy the fresh environment of the outdoors. In particular, they enjoy all the trees. To touch the very thing that is attracting the golfers, the club's bread and butter, is really taboo. As such, the benefits gained have to far outweigh the perceived or realized cost to the trees.

Touching this point, McCarthy stated that the light penetration gained is "priceless" to the green. Edgewood spends upwards of $35,000 annually on tree pruning. ArborCom's recommendations help to pinpoint exact needs when doing this pruning. When asked about the Green Committee's initial reaction to the recommendation of removing a number of trees, McCarthy stated that several members were shocked. Sensing this, McCarthy used ArborCom's findings to make a hole-by-hole, tree-by-tree "road map" of the actions needed. He used logical reasoning backed by hard, scientific data. He was able to quantify how much more sunlight would penetrate to the turf, thus making for a superior putting surface. The data enabled the committee to move from the "This guy's crazy!" reaction to one of more acceptance and finally agreement.

The recommendations were used to show where five particularly troubled greens would greatly benefit from increased light. On one particular hole, the course president stood alongside McCarthy and stated that three-quarters of the membership would never even realize any changes took place to the surrounding trees.

Ron stated that he was actually surprised at some of the trees that were blocking light. ArborCom's consultation demonstrated that some greens' sun windows were being adversely affected by trees two and even three hundred yards away! Again, scientific data proved far more convincing than an "educated guess" when it came time to make pruning recommendations. The scientific report helped McCarthy give the decision-makers of the golf course a working knowledge of the big picture. They started to see where the limited sun windows were and the importance of broadening those windows. It has opened the door for McCarthy to grow healthy, vigorous bentgrass. ■