

Tree inventory software eases the pain of tree removal

By ANDREW OVERBECK

"There are only two kinds of courses in this country," said Dave Oatis of the U.S. Golf Association, "ones that are overplanted and ones that will be overplanted."

Despite constant prodding by organizations like the USGA, most courses are just now starting to pay attention to their tree-management practices and implementing selective tree-removal programs.

According to Oatis, more courses are starting to feel the effects of tree-planting schemes that were popular 20 to 30 years ago.

"The top three problems are improper selection of species, improper location and planting too many trees," said Oatis director of the Northeast Region of the USGA Green Section.

These problems can lead to increased tree disease, weaker, poorly developed trees and increased competition with surrounding turf areas for sunlight, water and nutrients, said Dr. Jay Sipes of Virginia Tech University in Blacksburg, Va.

"The first step to combating these difficulties is to prepare a tree inventory," said Sipes. "First, identify the trees; second, scout for disease and pest presence and damage; third, identify pests; fourth, implement a management plan to take care of these problems."

GPS AND GIS

The second step, according to forester Jack Swaze of Swaze Burris Terra Turf and Trees in Houston, is to map the golf course with Global Positioning System (GPS) and Geographic Information System (GIS) software that provides superintendents and greens committees with a visual idea of how trees and turf are interacting on the golf course.

"Most courses are on a collision course with nature and they are going to have to manage trees just as they manage the turf in order to have optimum conditions," said Swaze. "We catalog and identify trees on an aerial map that assesses what they have and then the software can predict what a tree is going to do down the line."

The PC-based software program is pre-



An aerial image prepared by Terra Turf and Trees identifying tree placement on the 10th hole at BraeBurn Country Club in Houston.

pared for each golf course and is a "working tool" that can be used as a constantly evolving management device to change and update course conditions over time. Swaze recommends that an arborist review the data every four to five years to ensure that a proper management program is followed.

Jason Bass, certified arborist and presi-

dent of Point Forestry in Eagan, Minn., prepares similar turnkey software programs for golf courses.

"We do GPS and GIS tree inventories and we catalog tree species, condition, damage and disease," said Bass. "Then we show the superintendent where trees are too thick, where the trouble trees are,

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Who can take an oak tree? The Stump Man can



"Have stump grinder will travel..." is the raison d'être of the Crews Service Co.

By ANDREW OVERBECK

WALNUT GROVE, Mo. — Sick and tired of dealing with the hassles of owning a medium-sized tree-service company, Ted Crews sold his share of the business to his brother four years ago and struck out on his own. Crews, a certified arborist, is now waging a one-man battle to rid a seven-state region of a persistent evil...tree stumps.

"I wanted to do something that I could do by myself," said Crews. "A stump grinder was the only machine that one man could operate and make a living with."

And what a living Crews makes. In order to make his business feasible, he owns the most powerful stump

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Dead trees have their uses.

Trees versus turf: A constant battle over water

By JACK SWAYZE

That's a fine little sapling you planted there. It may not consume much water today, but have you considered the future?

A plant's leaf surface area basically determines its water usage. The larger the leaf surface, the greater the water loss. Evapotranspiration (ET), the loss of moisture into the atmosphere through the leaves, is effected by temperature, humidity, time of year, wind exposure and sun.

In the winter, for instance, dormant trees and turf require less water due to lack of foliage, cooler temperatures, and shorter daylight hours. Conversely, in the summer the usage can be significantly greater due to higher temperatures, sunlight, wind, and so on.

Cultural practices such as mowing keep the golf turf leaf surface area at a prescribed height. The moisture loss by the relatively small leaf surface area of turfgrasses is minimal

Jack Swayze is a forester and president of Terra Trees Turf, LLC, headquartered in Houston.

compared to tree leaves. The ET is still affected to a great degree by the temperature, wind, humidity, etc.

Overall, the water requirement of the turf is constant from year to year as it covers only the same given area with no change in height or biomass. The golf course will probably always average the same annual water consumption for the turf year after year.

However, trees differ from turf in that they have woody conductive and support tissue that connects foliage with the tender root hairs in the soil. The canopy of the tree is in equilibrium with its roots in the fact that one physiologically supports the other. Leaves are responsible for photosynthesis (carbohydrate production), while roots absorb moisture and nutrients. One can not exist without the other.

Trees have root systems that can extend for hundreds of feet and are often two or three times as long as the tree is tall. Tree roots' influence on turf can be considerable as they can extend into and grow across fairways. Trees can outcompete turf for moisture, nutrients and oxygen.

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What use is a dead tree?

By RON DODSON

What is a snag?

A snag is a dead or dying tree that is left standing. To many people, a snag is just firewood waiting to be cut, and until recently, foresters systematically removed dead trees because it was thought that they harbored disease and insect pests. In fact, most dead trees do not harbor active diseases or damaging insects.

It is now widely recognized that many bird species feed heavily on insects and thereby help to prevent serious insect outbreaks.

But how does a tree become a snag?

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Ron Dodson is president of Audubon International, headquartered in Selkirk, N.Y.

Swayze on trees

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By contrast to turf, trees are ever increasing in size. Each year they add more biomass in the form of leaves, twigs, trunk tissue and roots. This added tissue growth means an added amount of water, nutrients and oxygen needed to sustain the tree. A small tree requires only a few gallons of water a day. But as it grows, each year the amount needed increases proportionately. As the tree gains height, it is also subject to more extremes in wind and exposure, which can increase the ET rate and thus increase its water needs.

Water consumption for large trees such as the large live oak can possibly exceed 1,000 gallons per day when the ET rate is high. Should a golf course have thousands of trees, the moisture consumption rate of those trees will often well exceed the turf requirements. This amount of water for trees can run into the hundreds of thousands of gallons per day.

Another common misconception is that tree roots grow at deep depths. Generally, this is not true. Trees, like turf and all other plants, require oxygen for root growth, and therefore roots are only found where oxygen is present. In fact, oxygen

availability to the roots is a singular limiting factor for any plant. Since oxygen is more readily available near the soil surface, tree roots are most often found in the turf root zone. Keep in mind that a golf course is irrigated, fertilized, and aerated for better turf quality.

Trees are opportunistic and will send roots where conditions are optimum. In general, the better turf conditions are, the better it is for trees. If irrigation practices are to water lightly each night, then over time tree roots will evolve at a more shallow depth to pick up the available water. Deeper watering will help keep tree roots slightly deeper.

To help in keeping golf turf healthy with less tree-root influence, superintendents should root prune and/or use root barriers.

Root pruning along fairways, tees and greens can give several years of results, but can also damage the trees and cause stress problems if trees have become dependent on the turf irrigation. This approach should be done with caution if valuable trees are at risk.

Removing unnecessary trees as well as pruning will reduce overall moisture losses to trees. Pruning is remedial, though, unless major structural limbs are removed to permanently reduce the tree's



(Above) Roots pruned in 1996 at Riverside CC in Lake Jackson, Texas, show turf in the fairway and less on the tree side. (Below) Workers install a Biobarrier to prevent root encroachment at Riverside.



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size. This can get into aesthetic issues and likewise should be carefully addressed.

Nature has provided a natural selection of tree species for all plant zones. In arid regions, species survive on minimal water and should be used where practical. The same is true for wetter regions

where water issues are of less concern. In any case, planting the correct species in the right place is important. Keep in mind that the trees will grow and will require more water. Hopefully, the tree will have its needs met without compromising the turf quality. Remember that the game of golf is played on turf.

Dead trees

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Once a tree dies, the process of decay begins. Snags become areas of insect activity, fungal growth, and overall decay. Holes, or cavities, occur in both living and dead limbs and may occur through the process of natural decay, or wind, or lightning damage. Large cavities can occur where major limbs die and fall from the trunk. As snags decay, hardwood softens, and damaged areas become insect-infested. The cavities are enlarged by birds and mammals digging into the cavities and picking apart the wood for insects and for shelter or nesting sites.

What wildlife uses snags?

Two main groups of wildlife use snags — primary and secondary cavity nesters. Primary cavity nesters are species that must make their own cavity nest by drilling or pecking it out of the wood of a tree. Secondary cavity nesters either live in cavities made by primary cavity nesters, or in holes that have been left through the process of natural decay or damage.

Insect-eating wildlife species that are

primary cavity nesters and that are attracted to snags include all of the woodpecker species and nuthatches. Secondary cavity nesters include chickadees, tufted titmouse, brown creepers, as well as several species of larger birds such as the screech owl and American Kestrel.

Some of the larger trees, such as the shag bark hickory, also provide roosting and resting places for several species of bats, which are the single most important form of night-flying, insect-eating wildlife.

In addition to bird species, a variety of mammals, amphibians, and reptiles may also benefit from the food and shelter provided by decaying trees.

What are the benefits of snags?

Leaving dead and dying trees standing when they don't pose a threat to the safety of humans provides valuable resources for a wide range of wildlife species. Insect-eating activity is just one benefit of tree snags — nature's own way of controlling pests. Equally important is their role as nesting sites for a variety of wildlife species.

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