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DUTCH ELM DISEASE

Your elms have it, you don't know how to treat it.
Though there's still no sure cure,
there are treatments that can help the fight.

by Roger K. Bowman, grounds supervisor, University of Delaware, Newark, Del.

Deciding how to set up a tree care program, or any grounds maintenance program, has to be a matter of economics. In the case of Dutch Elm Disease (DED), the economic problem many companies face is often limited to calculating the cost in removing dead trees, because there has not been an effective treatment program.

Today, despite attempts at remedies, there are still just three basic ways to treat the problem.

First, there's a do-nothing program, where you simply let the disease run its course, and remove trees as they die. While this might appear to be the cheapest way to go, a closer look at the costs may be revealing.

The minimum cost of removal is around \$500, more likely in the range of \$500-750. If the tree is in a difficult location—near buildings, power lines, or other structures where removal is complicated—then costs can easily run to \$1,000 or more.

Then there's the additional cost of losing a tree whose value may be considerable, depending on its size, shape, and location. The loss of a mature elm with a classic shape in a desirable location could be as much as \$10,000, using the estimating procedure outlined in the "Guide for Establishing Values of Trees and Other Plants," from the International Society of Arboriculture.

Minimum control

A step up is a minimum control program, where dead wood is removed on a regular basis to, 1) minimize spread of the disease, and 2) eliminate breeding grounds for the elm bark beetle that carries the fungus on its body from infected trees to healthy ones.



Saving American elms, like this large specimen and more than 100 on the University of Delaware campus, is one goal of the plant operations department.

In tree removal and in pruning dead wood, destroying the wood is extremely important, again to eliminate homes for elm bark beetles and larvae.

Along with deadwooding, a minimum control program should include injections with a fungicide, to control *Ceratocystis ulmi*, the fungus that causes the disease. One of the two fungicides labeled for DED is Arbotect 20S. Although this product was first introduced in 1977, a recent approval for a three-season rate, based on new research at the University of Minnesota, and a new injection technique, have made it more effective.

The product plays a significant role in the third option: a complete tree care program that includes sanitation and inspection, controlling beetles,

and planting trees to replace earlier losses.

The elm bark beetle

In early spring before the growing season begins, one should reduce beetle populations by spraying trees with an insecticide. A second spraying in summer prevents beetles from eating the leaves.

Trucks with elevated platforms are recommended to reduce the spraying distance by 50 feet and to reduce the amount of material needed by 50 percent or more.

At the University of Delaware, we participated in a research program (1975-80) on trapping elm bark beetles, developed with the assistance of Dr. Jerry Lanier at Syracuse.

When the project ended, the traps were not available for a couple of years. We relied on our spraying program and elimination of breeding sites.

From 1980 to 1983, we saw a significant increase in the number of trees lost to DED. Losses were less than 5 percent during the time

beetle traps were used, and it jumped to more than 10 percent when traps were eliminated. Fortunately, the traps did become available commercially.

Besides spraying, sanitation and inspection are a central part of some elm tree care programs. Sanitation involves deadwooding (removal and destruction of dead and dying elm wood).

Trees shouldn't be pruned during growing season, because beetles are attracted to the cut areas. However, any dead trees, and dead or dying branches on healthy trees, should be removed and destroyed, to eliminate both breeding sites for elm bark beetles and reservoirs of infection for the disease-causing fungus.

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After soil has been removed to expose root flares all around the elm, university grounds crew members Douglas Lanham (right) and St. Clair McVicker drill holes and tap in injection tees. Tees are connected by tubing that connects to the tank containing fungicide mixed in the required amount of water. The fungicide is injected into the tree at 5-15 psi.

Tools are sterilized with a product like Lysol between each use to avoid transmitting the fungus between trees.

Inspection programs should be most intensive during the growing season, when trees should be watched daily for signs of "flagging," where a branch of the tree dies above a spot where beetles have been feeding, and the yellowing or dead leaves stand out like a flag amid the healthy green leaves.

If a dead branch is spotted, remove it immediately and make a visual check for infection. Peel back the bark. If the wood shows dark streaks, the disease is present. If there is doubt, you may want to send a sample to the county agricultural extension service to determine whether the branch died from the fungal disease.

A three-year rate

Success against DED can be achieved using Arbotect fungicide injections at a three-year rate. Trees are injected at three times the normal dose, and then not treated for the next two years.

This new method also involves excavation around the trunk and injecting into root flares using injection tees fed from a pressurized tank at 5-15 psi, rather than by gravity feed into tees placed above ground in the trunk itself.

At the University of Delaware, we

tested the method on six trees, two trees at a time. We saw no signs of flagging or other problems. A three-man crew, injecting three times a day, completed 44 of the most desirable trees, based on their shape, size, and location.

We found it best to divide elms into three classes and treat each class for one year. After three years, the first group will be ready for re-treatment.

Treating at three times the rate, but having to do it just every third year is advantageous from several points:

- It provides better protection because the fungicide moves into the new wood of the tree from year to year when used at the three-year rate.

- It's less damaging because there's no digging and drilling holes every year, so the tree has more time to recover.

- And, it clearly saves money.

For example, cost to inject 44 trees (labor, water, and fungicide) is about \$7,400 or about \$170 per tree. Prorated over three years, that's less than \$60 per tree. Saving a tree looks like a bargain, compared to the minimum cost of removing a dead tree.

Additionally, with expensive replacement, one must wait years for a young tree to develop.

A small four-inch diameter tree, including planting and a one-year guarantee, costs about \$1,200.

As further protection, you can also use chemical treatment in the soil to prevent root grafts between affected and healthy trees. Root grafts also can be controlled by cutting a trench about 18 inches deep between trees and severing any connecting roots. (In some areas, this technique can't be used because of so many underground utilities.)

Community checks

For further control, you might consider extending tree inspections into the community, both for homeowners and municipally-owned trees which might be afflicted with DED. If so, homeowners or city workers should be advised to contact a professional arborist.

It should be pointed out that chances of saving a tree with 10-15 percent of the crown affected are only fair, so the owner should consider whether to try to save it, and what the tree's appearance will be after removing the diseased sections.

If flagging is between 5-10 percent of the crown, chances are good, and 5 percent or less, then there's an excellent chance of saving the tree.

In all cases, you need 10 feet of uninfected wood below the cut you make to remove diseased portions. Then continuing care must always be performed.

WT&T

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LANDSCAPE PROFILE

A STAR IS BUILT

It doesn't look like much now—just rock, dust, and hills. By October, Star Pass TPC in Tucson will play host to its pro golf tournament.

by Ken Kuhajda, managing editor



If brown is your color, you may want to go to Tucson, Ariz. But you'd better hurry.

That's where Star Pass Tournament Players Club will soon be rising from the rocks that dominate the southeast Arizona landscape.

Star Pass, its ground broke in April 1985, doesn't sport any green.

The brown of the desert and hills of west Tucson dominate. Today, Star Pass doesn't look much like a world-class course. It will soon.

If all goes as planned, Star Pass will host the Tucson Match Play tourney this October.

By then, course superintendent Harold Vaubel prays, the tees, fairways, and greens will be a lush green.

Star Pass, one of a growing list of TPC-owned and operated clubs, will add to Tucson's list of new and impressive courses.

Building on rock

Most likely, the Wadsworth Golf

Below, superintendent Harold Vaubel (left) and Wadsworth Golf Construction superintendent Kevin Sutherland. Top left, assistant superintendent David Michael. Near left, irrigation trenches are carved.



Construction Company, Star Pass builders, took a peek at the planned site and brought along extra dynamite.

The terrain has not made the job easier for Wadsworth job supervisor Steve Robison, who has been on the site since groundbreaking.

"This has not been an easy job to work because of the rock," says Robison. His co-worker, greens shaper Mike Hatchcock, agrees. "I can verify that because of my back," he says with a smile.

By the time Wadsworth finishes, they will have seeded bentgrass greens, and stolonized bermuda 419 fairways and bermuda 328 tees.

Then it's up to Star Pass superintendent Vaubel and crew to nurture hybrid bermuda, common bermuda, bentgrass, and desert vegetation that will lie on the course's 120 acres.

How to build a course

In the last year Wadsworth has:

- staked fairways and cleared vegetation. Some vegetation, such as the saguaro cactus, was held for later placement (Arizona law says you can't kill several desert plants, including the saguaro cactus, many of which are well over 100 years old).

- shaped fairways, in the process, dynamiting the impeding rock.

- performed all drainage work and installed the irrigation system.

- reshaped and removed all excess rock, backfilled the trenches, and then reshaped the course again.

- performed prep work for the topsoil. They then placed top soil layers of up to 6 inches over the course.

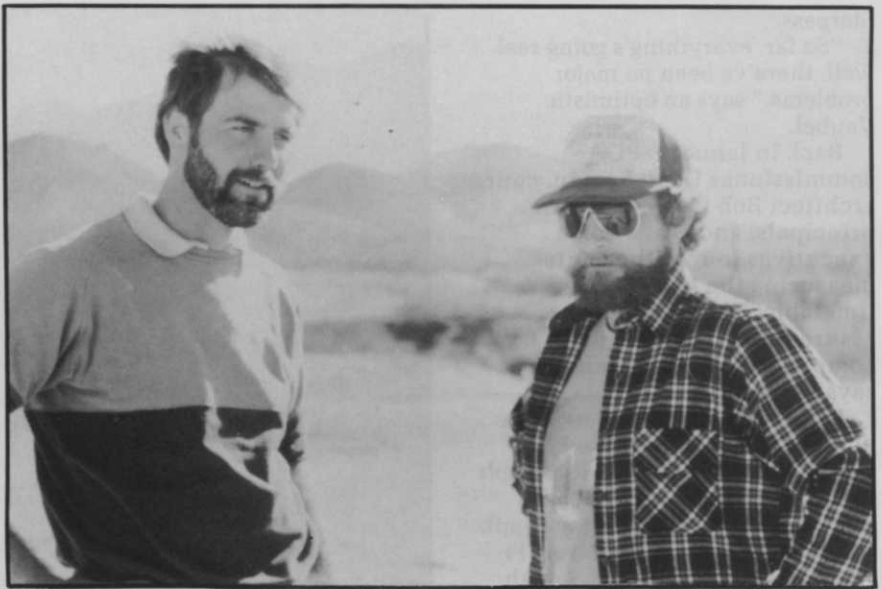
- prepped the greens, beginning with drainage tiles, a 4-inch gravel blanket, a 2-inch course sand blanket (choker layer), and a 10-inch greens mix comprised of fine sand with organic matter added (in this case, 20 percent Canadian peatmoss).

- seeded the greens, sodded the green slopes and bunker slopes, and stolonized the fairways and tee tops.

Wadsworth, no stranger to building golf courses in Arizona, has also enhanced the natural mounding that the TPC requires for a stadium golf effect.

They've also left room for underground utility cables. None will be above ground.

Wadsworth has 32 employees on site, including three shapers and 11



Greens shaper Mike Hatchcock(right) and Wadsworth supervisor Steve Robison take a break at Star Pass.

operators. The company should be off-site by early May.

Arizona has become a sort of second home to some Wadsworth employees. Construction superintendent Kevin Sutherland, a Michigan native, has spent the last three years in Arizona building new courses.

Among those: Desert Highlands, La Paloma, and Ventanna Canyon.

A good opportunity

Assistant superintendent David Michael, 28, is working on his third under-construction course. That's what superintendent Vaubel was looking for in an assistant super: someone with construction experience.

Vaubel had previously served as superintendent at Albuquerque Country Club and Desert Forest Golf Club, and assistant superintendent at Tucson National Golf Club and Goodyear Golf and Country Club.

Michael, formerly superintendent at La Mariposa Sports Club in Tucson, says working for the PGA represents a "challenge and a good opportunity."

As he tours the course, Michael seems to know every hill, every swale. The new course has become his friend.

"With the PGA, the number one concern is quality," he says. "With the pros, the quality of their game is number one and so is the quality of their courses."

Michael, who gave up a career in

electrical engineering after his junior year in college, obtained his agronomy degree from the University of Arizona.

Trodding golf courses since age six, Michael has no regrets. He's living his desire.

Vaubel and Michael will employ an 18-man crew at full strength.

The only other employee at this time is head mechanic Al Fleming, a former staffer at Tucson Country Club.

Water, water, water...

After Wadsworth clears out, Vaubel and Michael will begin nurturing the baby turf to life.

It's going to take a lot of care. Semi-arid Tucson gets only 11 inches of rain per year. Irrigation with effluent water (state law prohibits irrigation with potable water) will be ongoing, perhaps as much as 10 to 15 minutes per hour.

The 100-degree heat of the average Tucson summer, coupled with bentgrass greens, will provide a challenge for Vaubel and crew. The fairway and tee bermudagrass should prosper.

By early fall, says Vaubel, the course will be in shape for the 500 or so members the developer, Uniwest, hopes to draw.

In addition, the hilly surrounding areas will be bustling with construction of houses and condominiums. Uniwest is developing some 800 acres at Starpass.

Starpass.

"So far, everything's going real well, there've been no major problems," says an optimistic Vaubel.

Back in January, PGA commissioner Dean Beman, course architect Bob Cupp, Uniwest principals, and Wadsworth executives toured the course, measuring the construction timetable. They came away assured that the course will be completed by tournament time, says Vaubel.

"They said that Star Pass is the number one priority of the PGA," says Vaubel. Just in case, Randolph Golf Course in Tucson has been lined up as a back-up for the event.

Currently the PGA controls 14 courses throughout the U.S. with four slated for opening in 1986. Each year four more are slated to open.

Star Pass, barring unforeseen disaster during the August "monsoon season" (what residents call the rainy period); should be ripe come October. **WT&T**



This common desert scene will be a faded memory when Star Pass hosts its first pro tournament this October.

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