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It's the  
groundwork for  
a more  
playable  
course.





For more and more superintendents that's the case. Because they know effective disease control is the best way to achieve a better looking, more playable course. And that's why Daconil 2787 fungicide is the basis of their fungicide spray program.

**Number one on tees and greens.**

Daconil 2787 is the product of choice on America's tees and greens.

The reason... Daconil 2787 works. It consistently delivers unsurpassed control of 9 turf diseases including dollar spot (and benomyl-resistant dollar spot), *Helminthosporium* (leafspot and melting out), red thread and large brown patch.

Fact is, Daconil 2787 is the broadest spectrum contact fungicide on the market today.

What's more, in 15 years of continuous use, there has never been a documented case of resistance. Even on courses where it was applied at weekly intervals for many years.

**Outstanding on fairways.**

Make Daconil 2787 the groundwork of your program for fairways too. It will deliver the same unequalled disease control it does on tees and greens.

And you need first rate protection on fairways. Because diseases are mobile and can easily spread from fairways to tees and greens. Especially dollar spot, brown patch and leafspot.

You can control these three major diseases on a wide variety of grasses all season long with Daconil 2787 without having to worry about burning fairway turf even in the hottest weather.

**Easy and economical to use.**

The flowable formulation of Daconil 2787 allows for fast, easy handling because it flows readily and disperses quickly. So there's no clogging of spray equipment.

And since Daconil 2787 has a built-in surfactant, you're assured of superior sticking power, extended coverage on the crown and sheath of grass blades and excellent fungicide retention even after heavy rains or watering.

All of which adds up to proven residual control when used at recommended rates.

When you consider everything Daconil 2787 has to offer, it's no wonder more and more superintendents are making it the basis of their disease control program. On tees, greens, fairways and even ornamentals.

With a full and regular schedule of Daconil 2787, your turf will be healthier and more vigorous to better withstand traffic and play. And it makes for easier weed control too.

Groundwork like that adds up to a more playable course. And in your business, that's the name of the game.

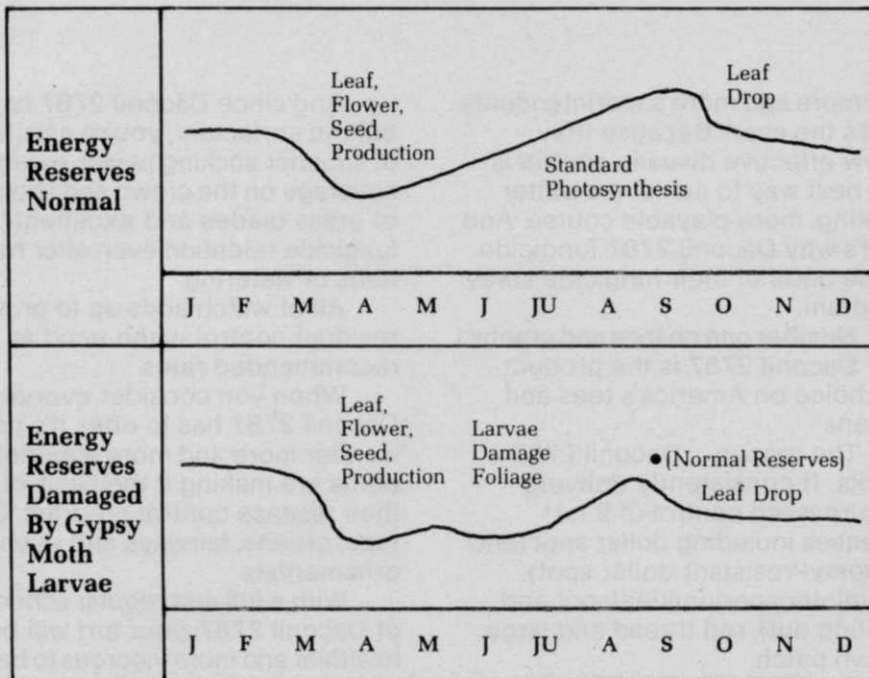


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energy and when it produces energy. It can only produce energy via photosynthesis or draw from its reserves. Leaves carry on the process of photosynthesis, so deciduous trees produce energy only from spring to fall. Leaf, flower, and seed production use energy. Growth and defensive actions require energy as well. Any energy consuming process that occurs while the tree lacks leaves is a potential drain on its reserves and health.

As Shigo says, the city tree has many more problems than its forest relatives. Competition for survival from the seed stage is greater in the forest, however. Nursery practices may produce trees which wouldn't survive in the forest.

Trees with favorable energy curves, storage capacity, or natural resistance should be selected in the future for urban use.

Finally, some maintenance tools have not kept pace with research findings, Shigo says. Few saws or pruning tools work without damaging the collar or branch ridge during pruning. Too often the cut is sloppily made and bark is stripped during pruning. The size of the saw may actually prevent proper placement outside of the branch collar.

Shigo says there is a point when you let the patient die. Core samples showing little or no starch indicate the tree is a hopeless case. His hope is that trees with declining reserves can restore them in some way.

The case of the Gypsy Moth is a perfect example of dwindling energy production caused by foliage damage. Weakened trees are more susceptible to other injury. If energy reserves could be restored, defoliated oaks could stand a better chance for survival. Elms and chestnut trees which still have hope could be saved in the same way.

The theory appears sound. Shigo and other researchers in the U.S. are working cooperatively to prove it's sound. Some results will be available this fall. I'm going back to New Hampshire this summer to see Shigo and his team for an update. As soon as there is proof, *Weeds Trees & Turf* will let you know.

WTT

can see areas where injuries by man or insect caused decay and the tree walled the wound off.

Recently, Shigo has theorized the walling off process takes energy, just as growth, foliage production, and seed production do. If a tree is weak from performing any normal task or from previous wounds, it walls off poorly and decay will spread.

In pruning, cutting flush to the trunk injures the collar of the branch. This, in turn, causes damage within the trunk. If the collar is not damaged, a wall will form and no damage is done to the trunk. This outer wall, according to Shigo, is highly protective but weak structurally. When other strains, such as wind or temperature, are put on the trunk, the tissues along the exterior wall may split to form a circumferential crack called a ring snake.

The so-called heartwood of a tree may not be active in nutrient transport and storage like the sapwood, but it does provide support and will wall off decayed tissue like sapwood. The heartwood, Shigo found, is not defenseless.

Cabling and bracing does cause injury to the tree, but this damage can be minimized. Holes should be made only in sound wood and large, round washers should be used. The tree will surround and

grow over the bolt, washer, and nut if properly done. Square or diamond-shaped washers should not be used since the tree has difficulty walling these off.

Lag screws should also be placed into sound wood only to assure healthy walling off of the screw inside the branch or trunk.

Prior to filling cavities in trees, do not cut the wound to be pointed at the top and bottom. The wound will close better if the shape of the opening is oval or round. Filling the cavity is a preferred substitute to drilling a drain tube. Drain tubes only cause more injury. Wet wood does not necessarily mean decayed wood, Shigo says. Filling and draining cavities may not be helpful.

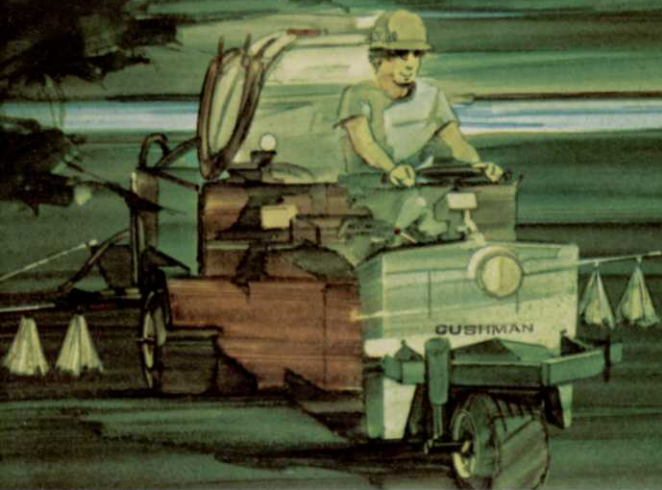
#### Other Ideas

One major problem with Dutch Elm Disease, according to Shigo, is the tree produces seed before it leafs out. Therefore the tree is not replacing energy by photosynthesis during seeding. The borer attacks the tree in a weakened condition, and the elm lacks the energy to properly wall off the injury. If the elm were healthy and had the needed energy to wall off the insect's damage, it would stand a better chance of survival.

You can make an energy curve for a tree by charting when it uses



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## TURF INSECTS

# GREENBUG BUILDUP IN OHIO IS LINKED TO OVERWINTERING

By HARRY D. NIEMCZYK and KEVIN T. POWER

The greenbug, *Schizaphis graminum* (Rondani), has been a persistent problem on Kentucky bluegrass and fine fescue lawns in the mid-west since the mid 1970's. In 1981 significant damage was reported from Iowa and Minnesota.

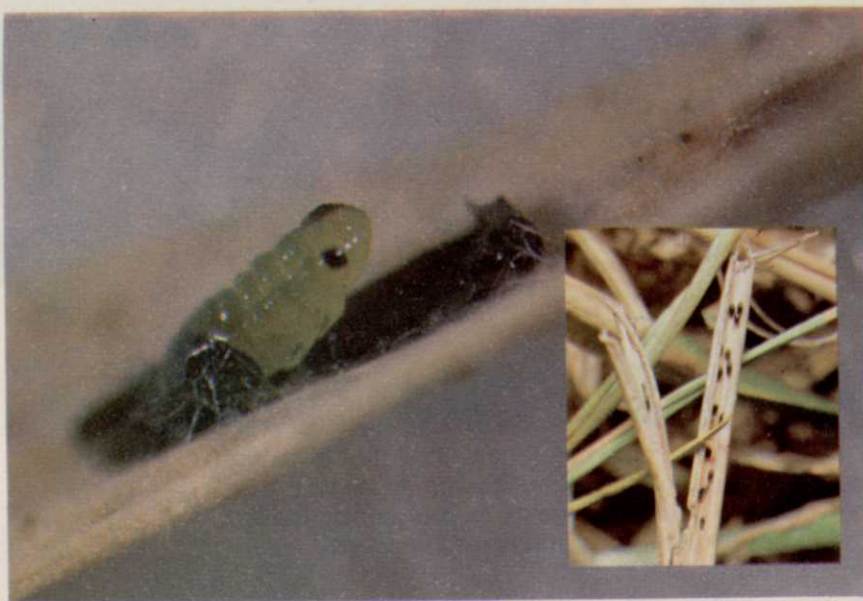
In Ohio, damage was minimal through the summer and early months of fall. However, for reasons not yet understood, populations in Cincinnati and Dayton increased dramatically in late October and persisted through most of November. Doug Halterman, Vice President of Leisure Lawn Corporation, Dayton, Ohio, and Dr. Dan Potter, University of Kentucky, both reported a similar buildup in Louisville, Kentucky. Infestations were high enough to cause severe damage to some lawns. In Ohio, swift application of Orthene® by lawn care firms kept damage from being even more extensive.

### Many eggs laid in 1981

Examination of the infested Ohio lawns in November revealed thousands of greenbug eggs on grass blades and debris, such as tree leaves. While egg-laying female greenbugs have been collected previously from infested Ohio lawns during October - November (WTT June 1980), eggs were rare.

Laboratory and field observations have shown that greenbug eggs are light green when first laid, but soon turn shiny black. Eggs are glued to the surfaces of grass blades

Dr. Harry Niemczyk is professor of entomology at the Ohio Agricultural Research and Development Center in Wooster. He is also a member of the Weeds Trees & Turf editorial board. Kevin T. Power is turfgrass entomology technician, OARDC.



Nymph emerges from egg after overwintering in the Dayton, Ohio area. Black eggs on infested turf were collected in March and hatched after 48 hours at room temperature.

and various other debris commonly found in lawns.

### Winter survival confirmed

The uppermost question was: would the eggs survive the winter? To shed light on this point, plugs of turfgrass containing overwintered eggs were collected March 2, 1982 from lawns where they were observed the previous November. Some plugs were potted and placed in the greenhouse where temperatures remained about 75°F. Samples of eggs were also removed and incubated in the laboratory.

Within two days after being placed in the warm environments, eggs began hatching. In the same trial, pots placed in the greenhouse had 8 to 10 newly hatched greenbugs on the grass blades. This occurrence confirms my earlier theory (WTT June 1980) that the greenbug can overwinter as an egg

on home lawns in northern states.

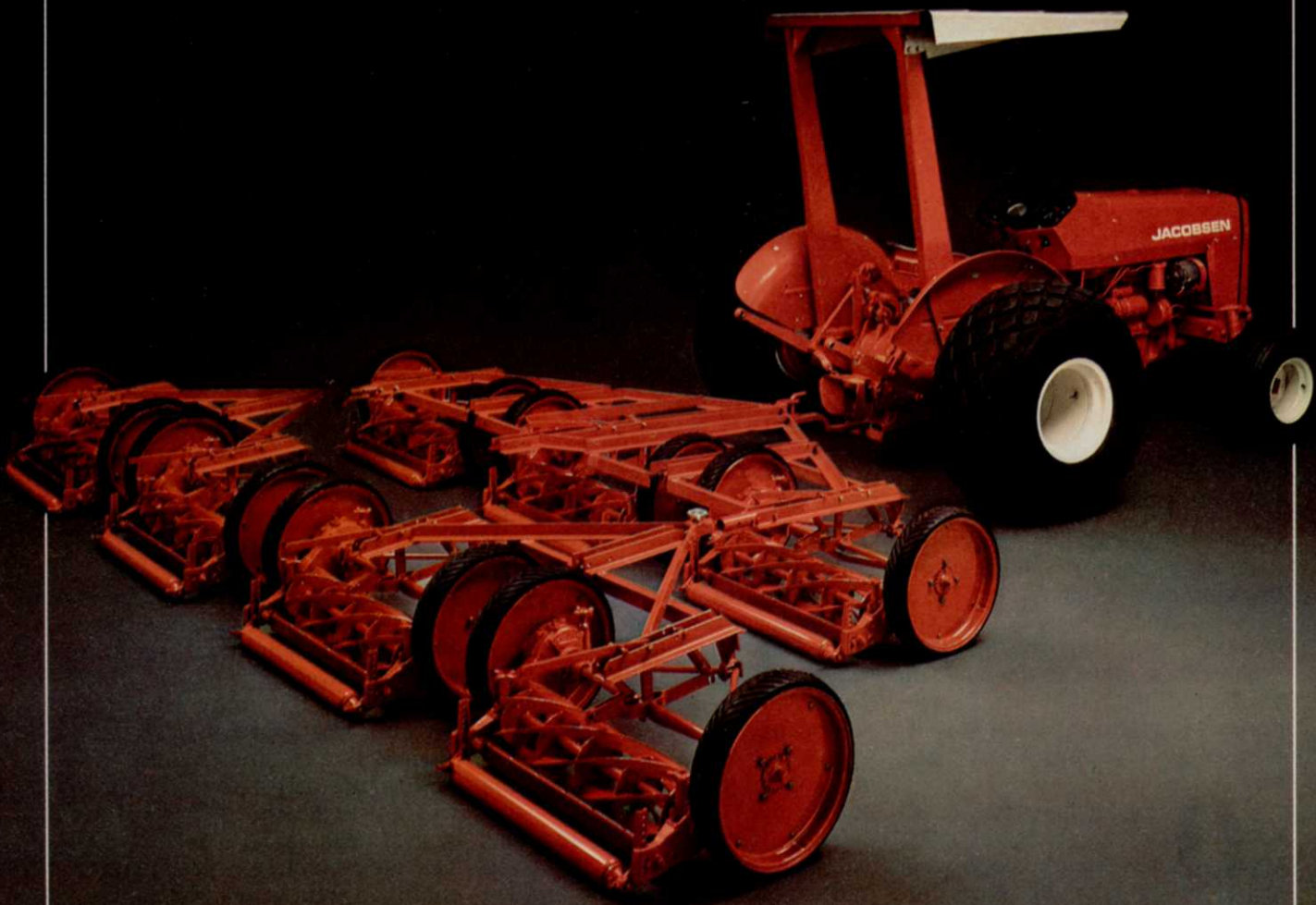
Halterman also reports hatched eggs found March 31, 1982.

### What to expect

Does this mean lawns with many overwintered eggs will have a severe problem in 1982? Laboratory observations made on one of the newly hatched greenbugs gives cause for some concern. Seven days after this aphid emerged from the overwintered egg, she bore three healthy young greenbugs. Surely the probability of a problem developing on such a lawn is at least increased. Frequent rains and extreme fluctuations in temperature which commonly occur during spring can destroy many newly hatched aphids. We plan to monitor further the development of greenbug populations on lawns that had high egg populations during the winter of 1981-82. **WTT**



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# CLEMATIS: VINE FOR EFFICIENT LANDSCAPES

By DOUGLAS J. CHAPMAN



*Dutchess of Edinburgh* blooms on wood from the previous season.

Clematis was originally introduced to the Americas by the late Colonel J.E. Springer. Clematis can be a colorful find, depending on the type, from May through October.

Generally, clematis does have a problem if planted in wet, poorly-drained soils but, if planted in well-drained, moist loamy soils, clematis thrives.

Clematis prefer limestone or alkaline soils with a pH from 7 to 7.5, although it has been noted to grow in pH as low as 5. But grow and thrive are two separate conditions.

One should consider planting in conditions from partial (80%) to full sun. To discourage problems, heavy organic mulching is important. This not only keeps the roots cool but also provides additional moisture; notwithstanding, clematis is a vine that likes frequent watering or, minimally, high humidity. The most significant disease problems are leaf spot and stem rot which often cause the plant to de-

cline or die out. These problems are only significant when the clematis is planted in poorly-drained-wet soil or in very shady conditions.

The clematis should be grouped into two classes—plants that bloom on previous season's wood (should be pruned after flowering) and plants that bloom on current season's wood (can be pruned during the spring).

Those that bloom on previous season's wood include *Clematis macropetala*, *C. montana*, and the cultivars 'Duchess of Edinburgh' and 'Nelly Moser.'

The clematis that are probably the most effective and easiest to culture include the ones that bloom on current season's wood, e.g. *C. jacmanii*, *C. peniculata*, *C. texensis*, and *C. viticella*. Several of the cultivars include 'The President,' 'Lord Neville,' *jackmanii* 'Superba,' and 'Picadilly.' A detailed look at several of the individual types will help give us an idea

about culture and general aggressiveness in the garden.

The native Scarlet Clematis (*C. texensis*) is a vine, reaching 6 feet in height with bright scarlet bell-shaped flowers which one can expect to see blooming from July through the first frost. Its bell-shaped flowers are exciting. This vine is perfectly hardy from Texas to Central Maine. The fruit are typical prune-shaped seeds which can give additional effectiveness during the mid to late fall months.

Sweetautumn Clematis (*C. paniculata* or *C. dioscoreifolia robusta*), an introduction from Japan, is probably the most aggressive and landscape effective of the clematis plants. It is not uncommon for Sweetautumn Clematis to reach 30 ft. in height, blooming in late August on current season's wood. The

*Continues on page 42*

Douglas J. Chapman is a horticulturist at Dow Gardens, Midland, Michigan



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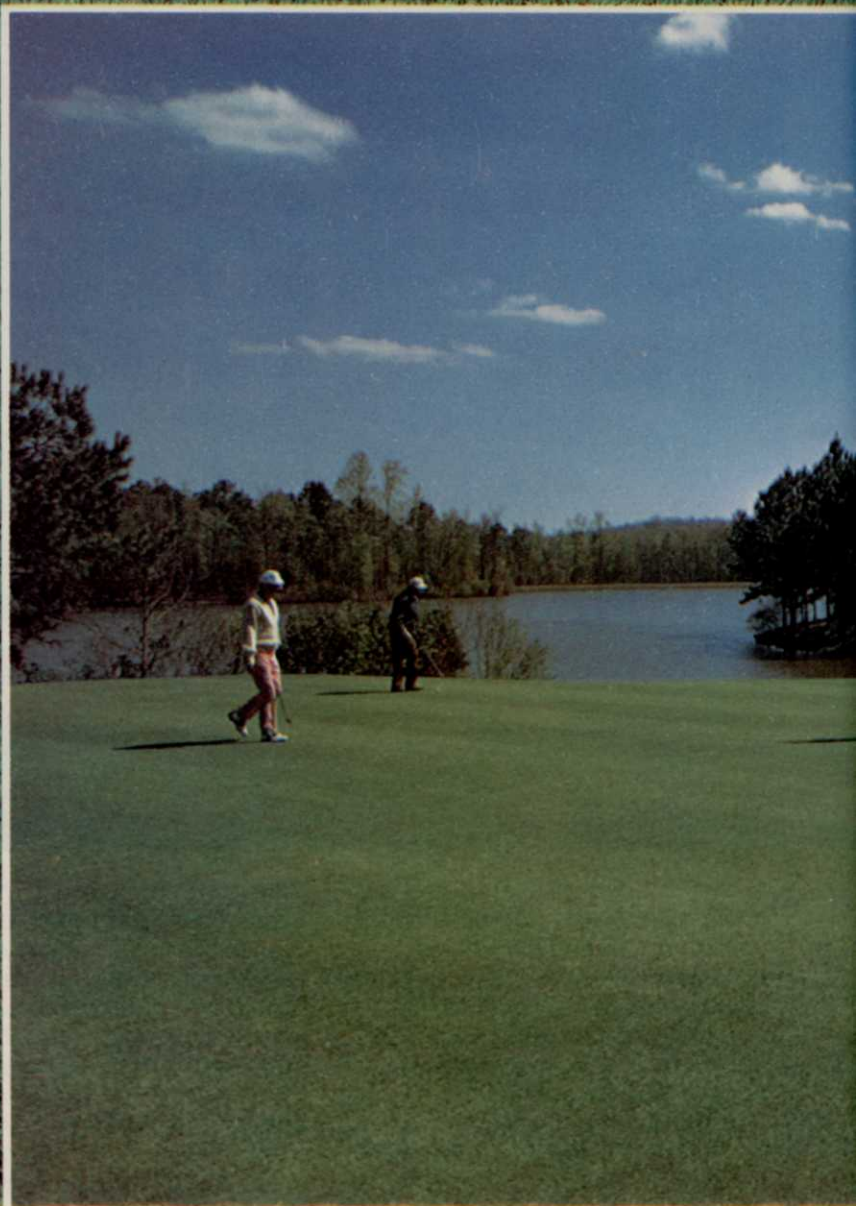
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