DAMAGE DILEMMA

What insect caused this turf damage? Quiz yourself. Answers are at the bottom of the page.

1

2

3

4

5

6

7

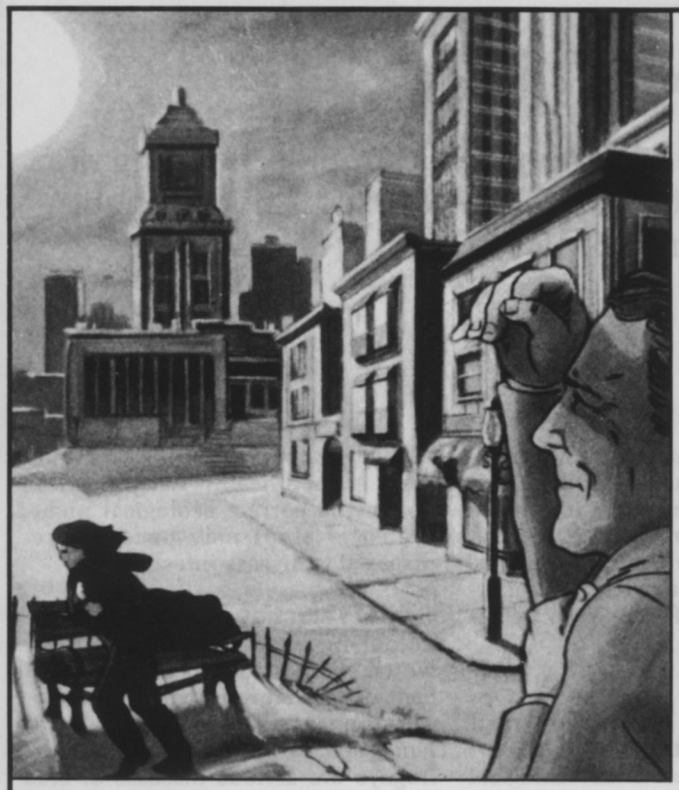
8

9

10

Answers:

1. Bluegrass billbug 2. Greenbug aphid 3. Grubs 4.Bluegrass billbug 5. Sod webworm 6. Winter grain mite 7. Chinch bug 8. Black turfgrass ataenius 9. Cutworm 10. Black turfgrass ataenius



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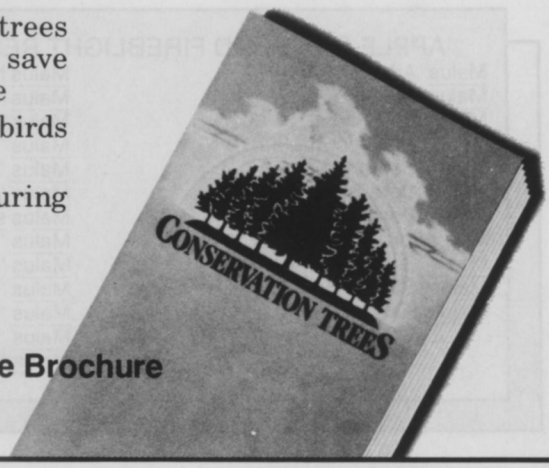
- The right way to prune trees

For your free brochure, send your name and address to: Conservation Trees, The National Arbor Day Foundation, Nebraska City, NE 68410.



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THE RIGHT NICHE

Disease control on trees and ornamentals may be as simple as finding the right environment for the plant to thrive. But when that's not enough, follow this guide.

by Douglas J. Chapman

Disease or pathogenic organisms frequently infect stressed plants. This weakening, or predisposition of plants to disease, can be the result of transplanting, drought, high water conditions or not placing the plant in the right ecological niche.

Ecological niche has not been considered enough in landscape design or development. For example, junipers must grow in full sun or in well-drained, droughty soils.

Few disease organisms will attack healthy, vigorous trees, such as oak wilt on oak; apple scab on crab apple; or Dutch elm disease on elm. But, in general, disease organisms attack weakened plants, like Botryospaeria canker on *Cornus sericea*.

Promotion of healthy, vigorous plants or a holistic approach, is the key to disease management. The holistic approach includes, in order of priority, four strategies: ecological niche, clonal or varietal resistance, maintenance and disease control programs. Each of the four strategies is an important component of "integrated plant management."

Douglas Chapman is the horticulturist-administrator at Dow Gardens in Midland, Mich. He is also a WT&T adviser.

Ecological niche

Planting a tree or shrub in the right place is paramount to health and survival. If one understands ecological requirements of plants and tries to grow them where they will flourish, then healthy landscapes will be the result.

Birch *(Betula papyrifera)* is a pioneer tree. Thus, it must be grown in full sun on sandy (low to medium nutrient) soils. Conversely, sugar maple *(Acer saccharum)* is a climax forest tree. Therefore it will grow in sun or shade in fertile, well-drained soils. Frequently, we plant trees or shrubs in conditions to which they are not adapted and try to fertilize or water them to good health. When they are not in the correct ecological niche, then the plant may become predisposed to disease infection.

Clonal selection

Selecting and planting cultivars which exhibit resistance to disease is becoming a more important tool for reducing disease problems in the landscape. Fireblight, apple scab and frogeye are serious diseases of crab apple.

To eliminate the need for fungicide application, and thus a maintenance requirement, resistant cultivars such as *Malus* 'Sugar Tyme', *M. floribunda*, or M. 'Donald Wyman' should be planted.

Each area of the country must plant different cultivars of the same species to determine which cultivars are resistant in that region. Disease organisms have geographic races or strains.

Many lists of resistant cultivars exist, but some may not apply to your area of the country.

For Michigan, I have included a list of disease resistant crab apples to apple scab and fireblight and a list of disease resistant junipers to Phomopsis twig blight (see charts).

PHOMOPSIS TWIG BLIGHT RESISTANT JUNIPERS

- Juniperus chinensis 'Hetzii'
- Juniperus chinensis 'Ketelerri'
- Juniperus chinensis 'Mint Julep'
- Juniperus chinensis 'Pfitzeriana'
- Juniperus chinensis 'Pfitzeriana Compacta'
- Juniperus chinensis procumbens
- Juniperus chinensis procumbens 'Nana'
- Juniperus chinensis sargentii
- Juniperus chinensis 'Upritht Hetzii'
- Juniperus horizontalis 'Douglasii'
- Juniperus sabina 'Broadmoor'
- Juniperus sabina 'Tamariscifolia'
- Juniperus virginiana 'Tripartita'

APPLE SCAB AND FIREBLIGHT RESISTANT CRAB APPLES

- Malus 'Adams'
- Malus 'Beverly'
- Malus 'Bob White'
- Malus 'Candied Apple'
- Malus 'Centurian'
- Malus 'Coralburst'
- Malus 'Donald Wyman'
- Malus floribunda
- Malus 'Golden Harvest'
- Malus 'Golden Hornet'
- Malus 'Harvest Gold'
- Malus hupehensis
- Malus 'Indian Magic'
- Malus 'Indian Summer'
- Malus 'Mary Potter'
- Malus 'Red Baron'
- Malus 'Red Jewel'
- Malus sargentii
- Malus 'Sentinel'
- Malus 'Silver Moon'
- Malus 'Sygar Tyme'
- Malus 'Van Eseltine'
- Malus 'White Angel'
- Malus 'White Cascade'

Maintenance

Healthy, vigorous trees are the best protection against disease infection. When we transplant a tree, it is weakened until establishment. We should try to help the plant to become established as rapidly as possible by watering when needed, fertilize to stimulate establishment, and protect against additional injury, such as lawn mower damage or pruning. Further, any condition which may weaken a tree (change in grade, over-pruning, insect attack, or drought) must be countered by watering, fertilizing, mulching or any practice which will protect and revitalize it.

Soil compaction is an urban problem which must be addressed. Fre-

quently, people or vehicles compact the soil when it is wet, during construction or after the landscape is completed. This condition must be countered. Strategies to counter compaction include mulching, rototilling and/or core aeration. Watering with alkaline water, found in much of the Midwest, negatively impacts plants which need a slightly acid soil to survive. If the deficient condition is corrected, the plant resumes growth, but, if not corrected, then decreased vigor and predisposition to disease are the end products.

Disease control programs

Pesticides should be just one strategy used in the arsenal to prevent or cure disease problems. Fungicides can be protective or prophylactic (curing disease after infection).

Many fungicides—Bordeaux, captan, ferbam, etc.—protect plants from disease infection. These fungicides must be applied before infection, thus a complete understanding of the disease life cycle is a must. Further, this group of fungicides must cover the entire paret of the plant that can be infected including leaves.

A second class of fungicides is prophylactic, which control the disease after infection. Several examples of this type of fungicide include Benlate and Subdue.

One must still know the biology of the particular pathogen or disease when prophylactic fungicides are used. Further, this group of fungicides can be applied after a disease infection is evident. Fungicides are only effective if the correct procedures are followed.

One must select the most efficacious fungicide to control the specific pathogen. This information can be obtained by consulting a supplier, local university, extension bulletins and/or reading the label.

Pesticides must be applied to the plant at the site of infection or when it can be absorbed to control the disease. Timing of application is critical. If one is trying to control apple scab, the correct fungicide must be applied prior to infection when the temperature is optimal, during the spring and before a rain.

Disease control programs must be developed around the total landscape. One should grow the plant in the right ecological niche, use disease resistant cultivars, provide good maintenance, and use pesticides to help overcome temporary problems. Pesticides should not be considered the long-term solution to plant diseases or a healthy landscape. **WT&T**

Fungicides

The following is only a representative list of fungicides frequently used to control diseases of woody ornamentals. No endorsement of products is intended.

BENOMYL—a systemic fungicide effective against apple scab, powdery mildew, botrytis and anthracnose. The water should be acidified in regions where the water pH is above 6.5.

BORDEAUX—a protective fungicide for fireblight and many foliar diseases.

CAPTAN—a limited-use broad spectrum protective fungicide which is effective for many foliar diseases.

CUPRIC HYDROXIDE—a fungicide against many leaf spots and blights. Phytotoxicity has been noted as a problem - Read the label.

CYCLOHEXIMIDE—effective for powdery mildews.

FENARIMOL—locally systemic fungicide used for the prevention and control of powdery mildew. Reduced dosages are recommended when used under high humidity-cool-cloudy conditions.

FOLPET—specific for leaf spot diseases.

MANCOZEB—a combination of maneb and zinc salt, effective for a broad group of foliage diseases and blights.

RIDOMIL—a systemic fungicide absorbed through the roots that controls phytophthora and pythium. One of the few products effective for phytophthora on rhododendrons.

STREPTOMYCIN—an antibiotic specific for bacterial pathogens, e.g. fireblight.

TRIADIMEFOR—a systemic fungicide effective for the control of powdery mildew and rusts. Check the label. There are some precautions related to phytotoxicity.

VINCLOZOLIN—effective for the control of Botrytis sp. and Sclerotinia sp. on woody ornamentals, herbs and bulbs.

ZINEB—good for the control of foliar diseases, rusts, and blight.

A bird's-eye view of a flowery courtyard at Phoenix's five-star Biltmore Hotel.

THE JEWEL'S GLITTER

At the Arizona Biltmore, you can eat marmalade made from the fruit of the hotel's own orange trees. The list of other trees and plants used on its 200 acres is mind-boggling.

by Carl Kovac

The Arizona Biltmore, Phoenix's world-class five-star resort hotel, is a place where you can stop and smell the flowers—and pick them, if you so desire. You don't even have to be a guest.

Opened in 1929 on 200 acres of citrus orchard land in the shadow of Squaw Peak, the Biltmore bills itself as "The Jewel of the Desert; a hideaway for the famous, the wealthy and those with discerning tastes." Ronald and Nancy Reagan honeymooned at the Biltmore. So did Harpo Marx and his bride. The guest list of national political figures, stage and movie greats and other celebrities is pages long.

Carl Kovac is a freelance writer based in Cleveland, Ohio.

The Biltmore has held a five-star rating for 27 consecutive years.

Contributing in no small part to the jewel's glitter are approximately 15 acres of carefully manicured grass, indigenous and naturalized trees and shrubs, and large, colorful flower beds.

An award-winner

Keeping all of this in award-winning shape are some 25 full-time employees under the direction of landscape manager Thomas Harrow. They obviously do their jobs well.

In 1983, the hotel was given the Environmental Quality Achievement Award by the American Hotel and Motel Association. The following year it earned a professional grounds maintenance Grand Award. In 1985, it won the Arizona Landscape Contractors' Association's Judge's Award and placed second last year in landscape and irrigation competition.

But then, this elegant oasis is no stranger to awards; the Biltmore has held a Mobil Travel Guide five-star rating for 27 consecutive years, longer than any other hotel in the United States. A petaled plaque planted in the hotel's North Patio—five purple alyssum "stars" in a square of white alyssum—extols this achievement. Flowery self-praise indeed.

Some 150,000 flowers—petunias,

pansies, snapdragons, begonias, stock dianthus and "a lot of geraniums" also are planted each October, Harrow says. "We plant flowers everywhere in the fall; under shrubs, behind the hotel—anyplace there's dirt.

"In the summer, we plant about 40,000 zinnias, vinca and portuluca. There are only a few flowers that can take 110-degree temperatures. We also like to rotate the flower beds in the summer, leaving at least one empty for six months. We treat each bed every three years with fungicides and add new potting soil and mulch."

Summer grass

Summer grass at the Biltmore is hybrid Tifgreen; winter grass is perennial rye. "Both go dormant about October," says Harrow. "In the fall we scalp thatch and overseed with about 14,000 pounds of perennial rye. In May, the summer grass automatically comes up, but we fertilize and do some thatching."

You'd expect to see a lot of palm trees dotting the Biltmore's landscape, given the location and climate. You'd be right. "There are five varieties of palms on the grounds," Harrow says, "But we also have palo verde, mesquite, some cactus, olive trees, fiscus, hibiscus, magnolias, evergreen pears, four varieties of pines and five different types of citrus trees. About 85 percent of the plant material on the hotel grounds is not native to the area. We're constantly getting new vegetation in the valley every year, which is why I have to keep going to school."

A tale of two gems: Gable-and-Lombard's and the Biltmore's

Frankly, Scarlett, he probably did give a damn.

When Clark Gable, who shall forever be remembered as Rhett Butler in the screen classic "Gone With The Wind," lost his wedding ring on the Arizona Biltmore's Adobe Golf Course, it's safe to assume he was at least somewhat concerned. How would he explain this to his wife, Carole Lombard? A wedding band simply doesn't fly off a finger, no matter how powerful the golf swing.

As luck would have it, however, a greenkeeper found the ring and returned it. Gable was reportedly "overjoyed."

The King was just one of hundreds of movie stars, big-name entertainers and athletes, politicians, public figures and other celebrities whose spikes have punctured the turf of what is now the Arizona Biltmore Country Club over the years.

A guesthouse like the one in which Clark Gable and Carole Lombard may have stayed.

The club consists of the 6,783-yard Adobe course, which went into operation in 1929, and the 6,397-yard Links Golf Course, which opened in 1976. Both are par 72.

Once a part of the resort hotel, the club became a separate entity in 1977. It is now owned by Phoenix businessmen Art Martori and Alan Mishkin and the Rostland Corp., headquartered in Toronto, a former owner and now supervising manager of the Biltmore.

Club membership is 350, but non-members are welcome on a tee time-available basis. Biltmore guests are offered reduced greens fees and preferred tee times over other non-members. Play averages 100,000 rounds a year, according to golf course supervisor Turner Reany.

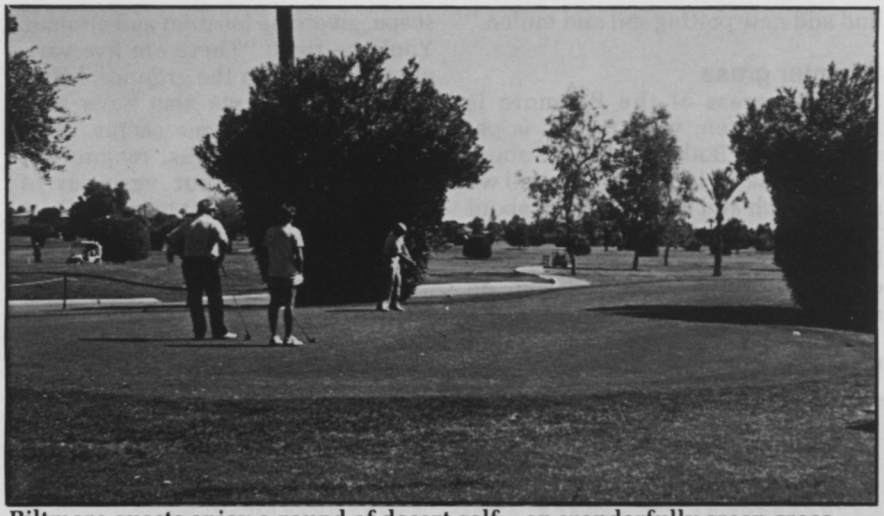
With an annual budget of $800,000, Reany oversees a crew of some 32 greenkeepers, equipment operators, mechanics, foremen and laborers. His equipment inventory includes seven riding mowers for maintaining greens, two hydraulically-driven reel mowers used on fairways, two rough mowers, two triplex mowers for collars and tee banks, three trap rakes, five vacuums for manicuring and clip sweeping, and 17 carts to move his crews around.

Common bermudagrass is used on fairways and roughs and hybrid bermuda on tees and greens. The courses are overseeded every October with perennial ryegrass. "We shut down one course while we overseed the other," Reany says. "We also have underground, wall-to-wall automatic irrigation. We water the courses daily. We're dealing with temperatures up to 115 degrees in the summer and in the 60s in winter."

Reany reports few problems with pests and weeds. "We spray Dursban and diazinon as needed to kill cut worms and sod webworms on the greens and use preemergence sprays to control crabgrass, goosegrass and poa annua."

That Reany and his crews keep the two courses in tournament condition is attested to by the fact that the LPGA has chosen the Arizona Biltmore Country Club as the site of its annual Sandstone Turquoise Classic the past four years.

—Carl Kovac



Biltmore guests enjoy a round of desert golf—on wonderfully green grass with lush vegetation all around.

Citrus plantings include orange, lemon, lime, grapefruit and tangello trees.

"We also have some sour orange trees," Harrow says, noting that "the fruit is picked each year and used by the hotel for marmalade."

The arsenal

All of this—grass, flowers, trees and shrubs—is watered by an automated underground irrigation system. Use of insecticides is limited "as much as possible," says Harrow, "for the safety of the guests and employees. We try not to spray. We inject the trees and use spreaders to apply granular insecticides to the flower beds. We do use 100-gallon sprayers to fertilize the grass and flowers."

Included in the Biltmore's landscaping inventory are two tractors, two triplex reel mowers, 18 power mowers, cord trimmers, chain saws, turf vacuums and electric carts to enable crews to get around the grounds.

"We also have our own street sweeper," Harrow says. "There are 15 acres of parking lots and streets on the property, and we clean them daily."

Unlike some posh resort hotels, the Biltmore has a policy of opening its grounds to the public. "We have one-hour Arizona Biltmore Grounds Tours twice a week. We get a lot of interest from organizations and schools," reports Harrow, who leads the the tours. "We want the public as well as guests to use the grounds; to enjoy the flowers and pick them, if they want to.

"We have weddings, circuses, auto shows and even rodeos here, with as many as 1,500 people out on the grass," he adds. This makes it hard on Harrow and his crew at times, but they don't seem to mind. "After an event, it's up to us to go out the next day and restore the grounds like nothing ever happened. And we do it. These people (the landscaping crew) really enjoy their jobs." **WT&T**