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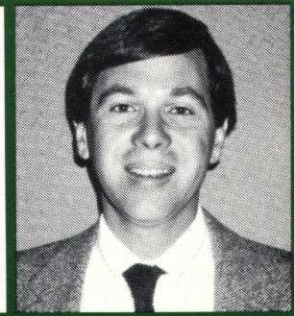
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FROM THE PRESIDENT'S DESK

Extraordinary Problems For Turf Managers



I would like to thank Paul Diegnau for hosting the May Superintendents' meeting. The weather graciously cooperated to create a perfect day with approximately 90 people in attendance.

A note of thanks to Jack Kolb and John Wiley of Turf Supply Company for providing the educational speaker at the meeting in May. The talk on chemical mode of action for various diseases was very informative and a timely subject of interest.

* * * *

This spring has produced extraordinary problems for turf managers. The immediate past two seasons were dry. Courses were forced to recover from harsh winters that resulted in much desiccation. Enormous effort was placed on attempts to regrow grass on tees, greens and fairways. This was coupled with lack of rainfall and less than ideal growing conditions. Unlike the struggle of the previous two years, the spring of 1991 has been indifferent with above average moisture and temperature factors. At times, growth rate of turf dominates the ability to stay ahead with regard to mowing.

With the abundance of precipitation, weed seeds—which previously laid dormant in the soil during drought years—spontaneously germinated this year, especially dandelions. Maintaining the golf course in championship condition can prove challenging.

* * * *

The hospitality tent at the U.S. Open will be situated between the clubhouse and first tee. Stop in for refreshments. This tournament will provide an excellent opportunity for the Association to represent our organization.

* * * *

The Research Tourney will be held on June 21. A steady stream of applications has been coming in. Be prompt with your entry. For information, call Rick Fredericksen at Woodhill Country Club.

— Tom Fischer
MGCSA President

ABOUT THE COVER

Our cover this month salutes Hazeltine National Golf Club, site of the 1991 U.S. Open June 13-16. Pictured is a view of the 16th hole with Chris Hague, Hazeltine golf course superintendent, in the inset. Please turn to Page 5 for the second of a two-part series on Hague's preparations for the Open by Editor John Harris and to Page 14 for a congratulatory letter from the MGCSA to the Hazeltine superintendent.

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What Makes Lyme Disease Tick?

By Brian Bret, Ph.D.

Lyme disease is rapidly becoming an important public health concern. This potentially debilitating illness is now the most common tickborne disease in the United States, and a likely place to get it is right in your backyard.

Reports of the disease are likely to increase as more people become aware of its causes and symptoms and seek medical help for proper diagnosis and treatment.

At the same time, the bacteria responsible for the disease is certain to increase for two reasons. First, the deer tick that transmits the disease from one host to another appears to be exploding in population. Second, the deer tick, the bacteria and the disease are spreading widely throughout most of the continental United States by mammals and birds that act as hosts for the ticks.

A recent article in *USA Today* stated that scientists now believe the bacteria causing Lyme disease was present in this country long before it became officially recognized in 1975. Therefore, instances of Lyme disease that occurred decades before were probably misdiagnosed because the disease was not known.

Recognizing the Symptoms

Lyme disease has a variety of symptoms, which makes it difficult to diagnose. It can also mimic other diseases such as Alzheimer's disease and certain neurological disorders.

One of the first signs of Lyme disease is a reddish, purplish or brownish rash around the site of the tick bite. The rash expands from the center out and may look like a bull's-eye with red rings inside other red rings. However, not everyone who contracts Lyme disease will experience a rash. In some cases, the rash can go away without the infected person realizing what it is. Other early symptoms, which can occur within 32 days of the tick bite, include swollen lymph nodes near the bite, flu-like symptoms, headache, fever, chills, stiff neck, nausea and fatigue.

Other Symptoms

Other symptoms that can occur later include overall body weakness, severe headaches, Bell's palsy, carpal tunnel syndrome, dizziness, seizures, disorientation, muscle and joint pain, neurological and cardiac problems and arthritic symptoms. Later symptoms can occur months to years after the person is infected.

If you think you might have been exposed to Lyme disease, contact your doctor immediately. It can be detected with a blood test and treated with antibiotics in the early stages.

Life Stages

The deer tick has a two-year life cycle, but goes through four life stages—egg, larvae, nymph and adult. In late spring or early summer, female adult deer ticks drop off their hosts and lay eggs on the ground. After about a month, the eggs hatch into seed ticks, which are six-legged larvae.

Soon after hatching, the larvae begin searching for hosts from which to feed. The larvae do most of their questing for hosts in leaf litter and the forest floor and do not climb high. For this reason, the primary host is the white-footed mouse, and it is at this stage that the tick acquires the Lyme disease bacteria (called a spirochete in the scientific community), from infected mice. Tick hosts can also include other small ground

dwelling mammals such as voles or some ground nesting birds. Newly hatched larvae are not infected with the Lyme disease bacteria. They usually pick it up from the infected host as they feed.

After feeding two to three days on the host, the larvae drop off on the ground and overwinter in leaf litter, thatch or soil. The next spring, they molt into eight-legged nymphs and still carry the infection.

Nymphs occur in late spring or early summer of the second year. Their populations peak in early or midsummer. Soon after molting, nymphs begin searching for hosts to feed on. Unlike the newly hatched larvae, nymphs are not restricted to ground level when searching for suitable hosts. They climb grasses and weeds. It is at this stage that humans are most susceptible to ticks. Other common nymph hosts include medium size mammals and birds. If the nymph is infected with the spirochete, it will pass it on to the next host it feeds on.

The average infection rate of nymphs is about 25 percent. This means that if you're bitten by a nymph, you have a one in four chance of being bitten by an infected tick. In some areas of the country, this rate can be significantly higher.

After a few days of feeding on their hosts, engorged nymphs drop to the ground and remain there until their final molt. By late summer or early fall, nymphs are molting into adults. Adult populations peak in midfall. If a nymph has been infected with the disease, it will carry it into adulthood as well.

Adult ticks climb shrubs and tall grasses in search of hosts. The most common host is the white-tail deer. Other large hosts include dogs and humans. After feeding for a few days, the adults drop off and overwinter. Adults can also be found the following spring. The infection rate of adult ticks can range from 40 to 50 percent.

Making Your Property Less Hospitable to Ticks

The control of Lyme disease provides an ideal opportunity for an integrated pest management approach. Control methods must include mechanical, physical and chemical methods aimed at the ticks and their hosts. However, no control program can guarantee that a person will never get Lyme disease.

If a tick does not find a host soon after it hatches or molts, it will die. Therefore, making your property less hospitable to tick hosts such as deer, white-footed mice, birds, squirrels, chipmunks and other mammals is helpful in controlling the spread of Lyme disease.

However, controlling hosts is not always possible or desirable over large areas. For instance, getting rid of deer populations would only affect adult ticks, and getting rid of white-footed mice would only affect larvae and nymphs. Likewise, controlling the dozens of species of birds and mammals that are supplemental hosts would probably be impossible.

Yet, homeowners can take steps to limit host populations—especially rodents—around their property. The following are some suggestions for making property less desirable as habitat for tick hosts.

- Keep lawns mowed.

(Continued on Page 17)

Final Stages of Preparations For the '91 U.S. Open

By JOHN HARRIS, EDITOR
Second of a Two-Part Series

The month of June for Minnesota Superintendents is normally a pleasant experience. School is out, and we are fully staffed. The weather is fair, and we are catching up on some unfinished business. At Hazeltine a much different picture is evolving.

Chris Hague and his staff are in the final stages of course preparation for one of golf's premier events. As the golfing nation's attention shifts to Chaska for a delightful week in June, many of us wonder "what would it be like?"

As of June the putting surface is all important. The intensity of maintaining that surface increases dramatically. Double cutting will begin in June along with a double grooming. In fact the emphasis will be on groomers attached to the greens mowers. There will be a tri-plex unit set up for grooming only. Its function will be additional grooming for those greens that require it.

For instance, double cutting and grooming takes place and stimp meter readings are taken. The goal is to have green speeds from 11.5 to 12.5 feet as conditions dictate. Also, all greens are to putt within three inches of each other.

After the initial cuttings/grooming, stimp readings will be taken and compared throughout the course. Those greens that meet the criteria will be left alone. Those that do not will receive additional groomings by the tri-plex and cut again, then stimp readings taken and so on until all greens meet the required speed and consistency. This can make cutting difficult for the operators as the lines will be non-existent. Therefore a spotter will be employed to help pinpoint the next pass.

Fairway cutting will be a daily task, with clippings disposed off-site during the actual tourney. The height of cut will be a $\frac{1}{16}$ " bench setting. There will be no aerification of fairways as a firm surface is the desired result. However a hydro-jet will be on hand should any serious trouble spots arise.

Tees will also receive daily cutting at $\frac{3}{8}$ " bench setting. The operator will repair all divots from the nearby seed and

soil box. He shouldn't have too much trouble with the tournament tee prior to the Open as they have been closed to membership play.

The practice tee has remained two-thirds closed, and only members of Hazeltine will be allowed to view the players at the practice range.

Rough will be cut at 5" in length. Here, out-front rotary decks and gull wing decks will be used. Fifteen acres of natural area will be brought back into the rough maintenance program to help accommodate the galleries.

The gallery roping is the full responsibility of the U.S.G.A. Roping will be placed 40-45 feet from the fairway edge. There will be one lane per hole for crossover, generally to be at the beginning of each fairway. High traffic areas on "cattle shoots" will be lined with a fabric and covered with wood chips. One week prior to the Open the rough will be seeded with a rye, bluegrass mixture and trampled in by the gallery.

Course Superintendent Chris Hague feels that the Corporate Tents are a key area for a successful tournament. Every tent has cable t.v. and phones, and it is directly linked to the Uniy-sis scoring system. Flooring and air conditioning for the ultimate in comfort is also provided. A California-based company was contracted to erect the tents two months prior as rain delays may have been a factor. Contractors are also required to clean up their own mess.

ABC will occupy four acres and be self sufficient. They will bring 350 employees in 30 semi-trailer trucks. They will be loaded with all the hardware necessary for a nationally televised event. Completely catered meals by their own mobile kitchen will keep them out of long concession lines and on the job.

Our own M.G.C.S.A. tent (not of the corporate variety) is between the pro-shop and the 1st tee. If you plan to attend, be sure to stop and say hello. Who knows, with a location of this nature you may meet some very interesting people.

Nicklaus, Irwin Head Open Field at Hazeltine

Jack Nicklaus, winner of four U.S. Opens, and Hale Irwin, winner of three, are among 10 former champions who have entered the 91st U.S. Open Championship to be played June 13-16 at Hazeltine National Golf Club in Chaska.

Entries for this year's Open reached 6,063, the second consecutive year the figure climbed over 6,000. A group of 65 players, led by Nicklaus and Irwin, are exempt from both local and sectional qualifying. These golfers include other Open champions David Graham, Tom Watson, Larry Nelson, Fuzzy Zoeller, Andy North, Raymond Floyd, Scott Simpson and Curtis Strange.

Also fully exempt are Phil Mickelson, the 1990 U.S. Amateur champion; Nick Faldo, Sandy Lyle and Steve Ballesteros, who have won both the Masters and the British Open; Ian Woosnam, current winner of the Masters, in April; Lee Trevino, 1990 Senior Open champion; Larry Mize, winner of the 1987 Masters; Greg Norman, the 1986 British Open champion and PGA cham-

pions Payne Stewart, Jeff Sluman and Bob Tway.

Exemptions from all qualifying were granted to six foreign players not otherwise exempt: Rodger Davis, Mike Harwood, Bernhard Langer, Mark McNulty, Jumbo Ozaki and Ronan Rafferty. Woosnam had been exempt under this category before he won the Masters.

Excluding the 65 fully exempt players, the other 5,998 entrants must earn their places in the 156-player Open field through one or both stages of 36-hole qualifying.

Local qualifying rounds were conducted at 81 sites between May 31 and May 22. Sectional qualifying is scheduled at 12 sites on June 3 and 4.

At stake in sectional qualifying will be 91 places in the championship proper. Exactly 600 players, 504 local qualifiers and the 96 players who are exempt from that phase of qualifying, will compete for those places.

Here's a Reference List You Can Put to Good Use

1. Research has shown that golf courses do not contribute significantly to groundwater contamination. Several university and government studies (in Massachusetts, New York and Florida) indicate that, when properly applied, pesticides and fertilizers used today on golf courses do not leach into groundwater in any significant amounts.

2. Modern turfgrass management practices (such as the use of slow-release nitrogen formulations) can greatly reduce the potential for nitrogen leaching or run-off, into water supplies. The organic (thatch) layer in healthy turfgrass also significantly reduces the potential for nutrient "movement."

3. An 18-hole golf course averages 140 acres. Pesticides and fertilizers are used only on portions of the golf course. The majority of the property often consists of natural areas that are not maintained with chemicals. These unmaintained areas are usually a home for wildlife, a diverse variety of native plants and large stands of trees.

4. Golf course superintendents are among the best-educated and most judicious users of chemical management tools. Today, most superintendents have university degrees in agronomy, horticulture or a related field. More than 3,500 superintendents also pursued continuing professional education through GCSAA last year. Although most golf courses

do not apply "restricted-use" pesticides, virtually all courses with GCSAA members have at least one staff person who is state-certified in the safe handling and use of these chemicals.

5. Because turf chemicals are often expensive, golf course superintendents have an economic incentive not to apply them. What's more, many superintendents entered the profession because of a love of nature and the outdoors and are strongly committed to conservation. In a recent survey, superintendents said they give extremely high priority to selecting maintenance practices that do not have a negative impact on the environment.

6. Golf courses do not contribute to the "yard waste" problems at America's landfills. Grass clippings and leaves are virtually always composted in unmaintained areas of the course. In some cases, the compost is recycled for use as a natural soil amendment.

7. The water used on golf courses is an excellent investment in both economic and environmental terms. Irrigated golf courses generate billions of tourist and property tax dollars for state economies. (America's golf courses are also bringing an increasing number of international tourists to the

(Continued on Page 7)

Facts About Golf And The Environment

As someone involved with the game of golf, you may already be aware that golf courses are being criticized for "damaging the environment." The use of turf chemicals, the impact on water and soil quality and the amount of irrigation water used are cited most often as public concerns about the golf industry.

Although most authorities agree that the maintenance of golf courses has comparatively little negative impact on the environment, the Golf Course Superintendents Association of America (GCSAA) believes that these issues must be addressed. And, through a comprehensive effort combining research, education and communications, GCSAA is leading the golf community's efforts to minimize the potential for ecological harm resulting from course maintenance.

However, the biggest problem we have is public perception—or, more accurately, public misperception—about the environmental impact of courses. These inaccuracies, if left uncorrected, could pose a serious threat to the vitality and integrity of the game.

You can help GCSAA change perceptions about our industry by reviewing the "Overview" on this page and sharing this information with elected officials, decision-makers and others with whom you have contact. Please do not hesitate to pass this information to others who share our belief that **golf is good for the environment.**

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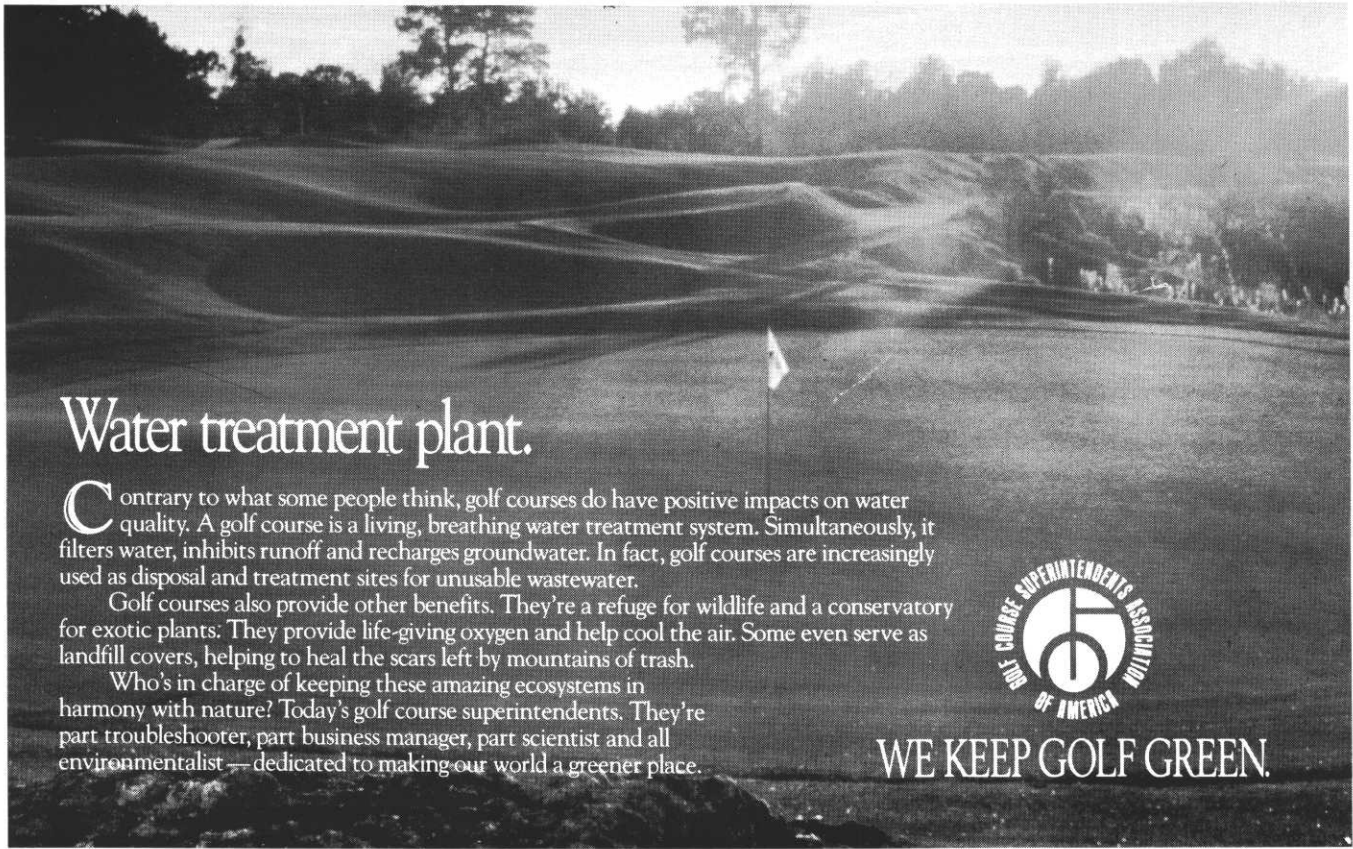
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Water treatment plant.

Contrary to what some people think, golf courses do have positive impacts on water quality. A golf course is a living, breathing water treatment system. Simultaneously, it filters water, inhibits runoff and recharges groundwater. In fact, golf courses are increasingly used as disposal and treatment sites for unusable wastewater.

Golf courses also provide other benefits. They're a refuge for wildlife and a conservatory for exotic plants: They provide life-giving oxygen and help cool the air. Some even serve as landfill covers, helping to heal the scars left by mountains of trash.

Who's in charge of keeping these amazing ecosystems in harmony with nature? Today's golf course superintendents. They're part troubleshooter, part business manager, part scientist and all environmentalist — dedicated to making our world a greener place.



WE KEEP GOLF GREEN.

Golf and the Environment—

(Continued from Page 6)

United States, thus helping to counter the foreign trade imbalance.)

When effectively irrigated, healthy turf provides numerous environmental benefits. Properly maintained turfgrass:

- produces oxygen (carbon dioxide exchange)
- removes pollutants from the air.
- cools the atmosphere (acts as a heat-sink)
- absorbs sound and glare
- prevents erosion
- filters natural and synthetic contaminants from rainfall and irrigation

Beyond these benefits, computerized irrigation systems and improved turfgrass varieties now allow courses to use less water more efficiently to achieve the same level of conditioning. Continuing research will provide even more "low-water" turfgrass varieties in the future.

8. In addition to turf-related benefits, courses provide other important ecologic and community assets.

Golf courses are:

- key sanctuaries for birds and other wildlife
- disposal and treatment sites for wastewater (effluent)
- attractive and environmentally sound "covers" for closed landfills and other ecologically damaged locations
- sites for non-golf recreational activities, such as jogging, walking, bird-watching, cross-country skiing and fishing
- businesses that provide hundreds of thousands of skilled and semi-skilled jobs
- places for social interaction and community events

- civic benefactors that fund major contributions to charities
- the keystone of a multi-billion dollar industry nationwide
- community improvements that add value to land, thus increasing local tax bases.

9. On golf's behalf, GCSAA has developed a strong and cooperative relationship with the U.S. Environmental Protection Agency and other major regulatory groups. Through governmental affairs, professional education and public information, the association strives to make environmental responsibility a basic precept for its members.

10. GCSAA and the entire golf community are firmly committed to seeking answers through research. The United States Golf Association, in partnership with GCSAA, is funding a three-year, \$3 million research program that will provide a number of those answers.

Unlike most industries, golf has the motivation, the resources and the willingness to address the issues now, before environmental questions seriously impede the growth of the game. By pursuing this enlightened path, it is hoped that golf will be increasingly perceived as a model environmental industry of the 1990s.

For more information or copies of additional fact sheets on specific subjects including UST Management, Hazard Communication, Endangered Species Protection Program and Groundwater Protection, please contact the Office of Government Relations, Golf Course Superintendents Association of America, 1421 Research Park Drive, Lawrence, KS 68049-3859, Telephone 800/472-7876 or 913/841-2240.

Hugo Recovery Shows Professionalism Pays Off

Wild Dunes Country Club was in shambles a year and a half ago after bearing the full fury of Hurricane Hugo.

But due to the massive rebuilding effort that followed the storm, the club now has a better course than before, according to Michael Fabrizio, course superintendent and treasurer for the Carolinas Golf Course Superintendents Association.

Meanwhile, a new course owned by the club, which had just begun construction when Hugo hit in September 1989, is now nearing completion, behind schedule but in top quality, Fabrizio said. "It was a pretty long year, but we had a lot of good things come out of it".

An example of commitment to quality and professionalism in the industry, Fabrizio led the \$1.5-million rebuilding of the club's Links course and Harbor course, both on the Isle of Palms near Charleston.

"We decided since we were closed, we would go ahead and do a renovation and try to make them better courses than they were before," he said.

Hugo tore up most of the greens, uprooted trees, smashed two maintenance buildings and ripped through irrigation

systems, Fabrizio said. Several holes had to be completely rebuilt, irrigation systems were re-installed, trees repaired, greens re-designed and rebuilt and two new maintenance facilities built.

And Mother Nature did not cooperate in helping Fabrizio and his staff undo her hurricane damage. Last summer, the Isle of Palms got 40 inches of rain during a 30-day period.

Despite all the setbacks, Links opened in July and Harbor was back in business by November.

Dunes West, the club's newest project a few miles from the other courses, should be open this summer, Fabrizio said.

From his vantage point as treasurer of the Carolinas GCSA, Fabrizio sees professionalism on the rise in the public's perception of golf course superintendents and in the superintendent's level of competence and skill.

"It's come a long way since I've been in the business," he said. "I've been in it since 1976. I think in certain areas, we still have a way to go. But we are doing a better job of being more professional, being more educated, trying to educate ourselves and keep up with the times."

He said environmental issues—particularly concerns about water conservation—are among the most serious issues facing golf course superintendents in the Carolinas.

The Links and Harbor courses use effluent water processed by the club's own treatment facility and now face upgrading the water plant to meet regulations from the state Department of Health and Environmental Control.

The state Water Resources Commission is considering placing restrictions on water use in some coastal areas, but Charleston is not currently included in those proposals.

Fabrizio, who was superintendent of a golf course at Dataw Island in Beaufort before taking the helm at Wild Dunes three years ago, said a continued effort on education is vital to keeping the industry's image and professionalism moving upward.

"GCSAA has made great strides in giving us the opportunity for education and also trying to present us in a more professional manner in government relations, public relations and educational opportunities," he said.

—Ron Barnett, *Carolina Newsletter*

Nice Weather Brings Out Tree/Shrub Trouble

Spring is here. Trees and shrubs are sprouting. Crabapples are in bloom. It is a great time of year to be outdoors enjoying nature.

But, according to James A. Fizzell, University of Illinois Horticulturalist in Cook County, we are not the only ones that enjoy this time of year. Since many of the insects and diseases that attack our plants like this kind of weather too, many problems that show up later can be prevented by some attention now.

Foliar diseases such as leafspot, anthracnose and rust invade leaves as they open in spring. Apple scab and blackspot of roses, though they can occur throughout the season, are less severe if primary infections are prevented.

Fizzell suggests treating plants with a history of these problems with appropriate preventive fungicides such as triforine, (Funginex), chlorothalonil (Bravo, Daconil 2787) or benomyl (Benlate). Be sure to follow label directions.

As soon as leaves emerge, insects that feed on them arrive as well. Eastern tent caterpillars make webs in fruit trees, willows and other ornamental trees. Clip out the "tents" when they appear, put them in a plastic bag and into the trash for pick up.

Masses of caterpillars on mugho pines are pine sawfly larvae. These insects will strip off the older needles on a shoot, but will not attack newly developing shoots. Strip the caterpillars off affected shoots with a gloved hand, or spray with malathion.

In the garden, there are insects just waiting for plants to arrive. Newly set broccoli or tomato plants that disappear or are cut off at the soil line are victims of cutworms that overwinter as hungry, immature larvae. Wrap stems with aluminum foil so the nighttime marauding pests can't find them. Slugs spend the night feasting on lettuce, petunias; earwigs prefer marigolds and chrysanthemum. Snail baits for slugs and carbaryl (Sevin) for earwigs will protect these varieties.

Take time now to do a little preventive work. You'll be glad later this season that you did.

—*The Bull Sheet,*
Midwest Association of Golf Course Superintendents

Cover-up.

Underneath some beautifully conditioned, championship golf courses are mountains of trash, the scars left by years of garbage replaced by a beautiful, invaluable green belt.

Landfill covers are only one way today's professionally managed golf courses are helping make our world a better place. They also filter water, inhibit runoff and are key avenues for groundwater recharge. They're a refuge for wildlife and a conservatory for exotic plants. Courses provide life-giving oxygen and help cool the air. Some even serve as disposal sites for effluent wastewater.

Who's in charge of keeping these amazing ecosystems in harmony with nature? Today's golf course superintendents. They're part troubleshooter, part business manager, part scientist and all environmentalist—dedicated to making our world a greener place.



WE KEEP GOLF GREEN.

Soil Temperature And Crabgrass

Crabgrass germination is very dependent on soil temperature, NOT air temperature. As a rule of thumb, crabgrass will germinate if you have three (3) consecutive days with soil temperatures taken between 7 and 8 a.m. at a three-inch depth for the soil textures indicated below.

SOIL TEXTURE	SOIL TEMPERATURE °F between 7 & 8 a.m.
Loam	50-52° F
Heavy wet clay soil	53-57° F
Sandy soil	49-51° F

The time (7 to 8 a.m.) represents the daily low point of soil temperatures. Soil temperatures can be expected to increase 10 to 15 degrees by midafternoon on a sunny, moderately dry date in late April and May. A person could take a soil temperature reading at 3 p.m. and get a high reading, i.e. 59°F. This does not mean that crabgrass will germinate.

Variations in soil temperatures depend on several factors:

1. The soil in a wet lawn area will warm up much slower than a dry soil.
2. Lawns on south-facing slopes warm up faster than those on north-facing slopes.
3. A thick lawn grown on muck sod (dark color) will warm up sooner than a thin lawn on light colored soil.

Wet clay soils may require up to 3 to 4 times more heat to warm them than when they are dry. Future weather conditions play an important role in determining if soils will remain ade-

quate soil temperature for good crabgrass germination. Generally a forecast for below normal temperatures, but dry and sunny conditions will result in little or no change in the seasonal warming trend of the soil. Future cloudy, cold, wet weather will produce a rapid decrease in soil temperatures. Warm, dry sunny weather provides a moderate rate of soil temperature increase.

Crabgrass germination is also dependent on abundant sunlight near the soil surface. A tall dense lawn or a heavily shaded area will delay and/or eliminate the potential for crabgrass germination. Moisture is also needed for the germination process and for survival after germination.

Crabgrass will germinate much later than you think. And, as you can see, many factors contribute to its germination. Consider these factors when applying pre-emergents. For instance, a somewhat dry sandy area should not be applied in the late spring, while a poorly drained lawn could be delayed until mid to late spring.

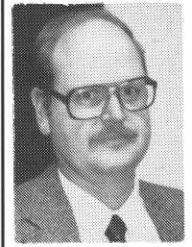
Several environmental factors can be used as guidelines in predicting crabgrass germination. You cannot use one factor only in making this decision.

1. Night temperature — consistently greater than 65°F.
2. Daytime temperature — consistently between 55-75°F.
3. Soil temperature — 7 to 10 consecutive days at or greater than 55-60°F.
4. Moist seedbed.

—Jeff Lefton, *Turfgrass Specialist,*
writing in *The Bull Sheet*

Proper Planting and Post-Planting Care are Keys To Successfully Establish Trees and Shrubs

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PART II POST-PLANTING CARE*

Watering: Newly planted plants require routine watering. Soils and weather conditions will dictate how often and how much water to apply. Examine the soil moisture 4 - 8 inches deep to determine the need for water. If the soil feels dry or just slightly damp, watering is needed. Soil type and drainage must also be considered. Well-drained, sandy soil will need more than a clay soil that may hold too much water. A slow trickle of the garden hose at the base of the plant for several hours or until the soil is thoroughly soaked is the best method. Short, frequent watering should be avoided as this does not promote deep root growth but rather, the development of a shallow root system which is vulnerable to several to several environmental stresses.

Mulching: Adding a mulch around the base of the plant is a very important part of plant care that is often overlooked. By mulching plants, a more favorable environment is provided for the tree roots. A mulch allows better infiltration of water, holds soil moisture, limits weed growth, and discourages injury from lawnmowers and weed whips.

A 3 - 6 inch layer of mulch, spread to form a 3 - 6 foot diameter circle around the plant should be applied. Keep the mulch area from direct contact with the tree trunk. Wood and bark chips are good mulching materials. A porous landscape fabric that allows gas and water exchange can be used a weed barrier underneath the chips. Plastic under mulch can cause roots to "suffocate" and is not recommended.

Fertilization: Fertilization of established plants should be done every 2 - 3 years in the fall after leaves have fallen or in early spring before growth begins.

It can be applied to the surface or placed in holes around the plants. Beware of burning turf if surface-applied. Surface applications should be watered in. Do not apply nitrogen in late summer unless the plant is nutrient deficient, as this can promote new growth that may not harden off properly and can be damaged by winter weather. Phosphorous and potassium can be applied in the fall as they will enhance winter acclimation.

Pruning: Proper pruning is vital to the health and structure of many plants. Any damaged limbs, and crossing or rubbing branches should be pruned when planting. The pruning cut should leave the branch collar without leaving a stub. Improper cuts can lead to disease problems and decay. Prune when trees are dormant, never when leaves are falling. Trees that "bleed" should be pruned in August. Oak trees *should not* be pruned between April 15 and July 1 due to possible spread of oak wilt disease. If pruning of oaks during this time is unavoidable, or if trees are damaged by storms or construction, apply a non-toxic pruning paint *immediately*. Pruning paint is not recommended for other pruning cuts or wounds.

Staking: Most newly planted trees will do better without staking. Young trees standing alone with their tops free to move will develop stronger, more resilient trunks than those staked for several years. trunk movement is required to develop strong, tapered trunks.

If however, a tree is unstable in a strong wind or is pushed over, then staking is required. A common problem with staking trees is the girdling effect that the ties can have on the tree. A piece of garden hose around the wire and a loop to allow movement can reduce this damage. Also soft nylon webbing or carpet strips can be attached by gommets to a stake. Often, wire is too tight around

the trunk and will effectively girdle and kill the tree. Whatever material is used, be sure to allow for some movement and *remove the stake and ties* once the tree is established — usually after one year.

Winter Care: Proper winter care begins in the summer. Proper watering and fertilization in spring and summer is required. Watering can be decreased in early fall and increased in late fall to provide water needed to withstand the drying winds of winter. Plants need to go dormant; don't encourage late growth by heavy watering and nitrogen fertilization in early fall. Plants should be thoroughly watered in late fall just prior to the soil freezing.

Sunscald, characterized by sunken, dried, or cracked bark, is caused by the heating effect of the winter sun in cold weather. It usually occurs on the south or southwest side of the tree. In the fall, wrap young and/or thin-barked trees with commercial tree wrap from the bottom up to the first major branch. Remove the wrap in spring. Thin-barked species such as maples and honeylocusts may require protection for several years.

Winter browning of evergreens is normally caused by the combined effects of wind and sun. Trees lose water from the leaves (needles) while roots are in frozen soil. To protect evergreens, place a screen of burlap or similar material on the south, west, and windward side of the tree to block wind and sun. Antidesiccant sprays are not very effective in offsetting the drying effects. Water evergreens well throughout the growing season, lightly in September, and then thoroughly again before the soil freezes. Select species and cultivars that tolerate winter conditions. Plant species susceptible to winter injury in areas of minimal exposure to winter wind and sun.

Animal damage can be severe during

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