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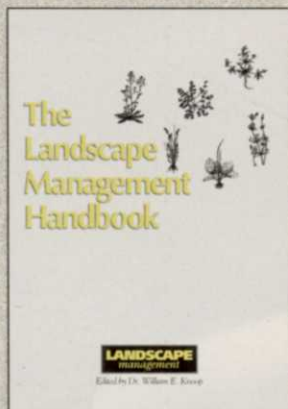
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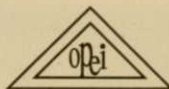
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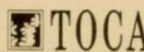
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Another LM exclusive: PLCAA takes fresh approach to education



Terry McIver

TERRY McIVER
Editor-in-Chief

Barring any trademark disputes, the Professional Lawn Care Association of America's Education and Research Foundation will be hereafter known as the Evergreen Foundation.

Dale Amstutz of Northern Lawns, Inc., Omaha, NE, is a PLCAA past president who now serves as president of the Foundation. Its stated mission is to "marshal the resources of the Green Industry and others to promote the development and maintenance of trails, greenways and other green spaces to improve the quality of life in America."

The theme of the Foundation is, "We improve the quality of life through green spaces."

Amstutz, in an exclusive interview with LM, says that in June of 1997, PLCAA took a hard look at what the original Foundation had accomplished, and saw room for improvement.

Now, says Amstutz, those who are on the current Foundation board know what's expected of them and are ready to work.

"It's a whole new fresh start," insists Amstutz. "We're going to evaluate ourselves regularly. And maybe each one of us will fill out a personal evaluation each year."

"We're doing a long-range plan, with specific goals," says Amstutz, who for years has been a dedicated member of PLCAA.

Helping with those goals are co-director Jim Brooks, lately with the Lawn Institute, and long before that PLCAA, and secretary Bob Tracinski of John Deere company.

Amstutz told LM that a committee would put together a philanthropic plan during the last week in April, to address questions of fund raising and staffing. Co-directors Dave Hanson of Envi-

ronmental Care and Ron Johnson of Novartis are working on a stewardship committee to set some guidelines for board member accountability, which include attendance at meetings and possibly fund raising assistance.

PLCAA also decided to inject some new blood into the Foundation by having PLCAA immediate past-presidents serve on the Foundation board," says Amstutz. Service on the Foundation board, "had been almost an honorary position; that's probably why nothing happened."

Another caution which Amstutz says sparked the Foundation to rethink its efforts, is that it had become too much of a self-serving entity, something which could have caused legal problems under its 501(c)3 classification. Lobbying on behalf of itself, for example, is not permitted.

Lou Wierichs, Jr., Pro-X Systems, Appleton, WI, serves as Foundation vice president. PLCAA executive vp Tom Delaney is treasurer.

Other changes at PLCAA include an upgrade to Windows 95 software, and a new health care provider, which according to Delaney, will save the association \$7900. A new long distance telephone service is also saving the association about \$500 per month. And, the PLCAA website will soon include a "members only" section.

In other big news, **The Lawn Institute** has agreed to let **Turfgrass Producers International** be the Institute's "green knight." TPI was in the running to merge with the LI, as was PLCAA.

Says TPI's Doug Fender, "The Institute invited TPI to pick up the mission of the Lawn Institute and let [the Institute] dissolve. We're very excited. We can integrate the Lawn Institute's mission (to proclaim the benefits of turfgrass) into the TPI Turf Resource Center. In the future there may be an opportunity to revitalize the Lawn Institute as a separate entity." **LM**

One final exclusive: my wife Terrie and I were blessed with a beautiful baby girl on April 9th. Her name is Hannah Marie. God is faithful!

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Killing weeds in juniper beds

I have a problem with weeds and bermudagrass coming up through juniper beds. A local supplier told me that there is no postemergent herbicide that would kill the intruders without harming the juniper. They recommended that I go to a preemergent program. This may help keep the weeds down, but what about the bermudagrass? I suppose this is actually a two-fold problem. What do you suggest?

- NC

Perhaps your local supplier is not familiar with Vantage herbicide manufactured by BASF. Vantage is a selective, broad spectrum, postemergent herbicide used to manage annual and perennial grassy weeds in turf, ornamentals and other specific areas.

For bermudagrass in juniper beds, Vantage can be applied without harming the junipers. Use about three fl. oz. of Vantage per one gallon of water. This should also help manage annual grasses from 6 - 12 inches in height as well as quackgrass, another difficult perennial grassy weed.

For better results, consider using two applications of Vantage. Make the first application when the bermudagrass begins growing in the spring. Apply the second treatment after the treated bermudagrass turns red and new growth begins to emerge. Follow label specifications for best results.

Vantage is selective to grassy plants, so be careful

when applying near desirable grass plants. Drift can also injure the flowers of flowering plants, however, BASF representatives indicate that injury is temporary and new blooms will not be affected. When applying Vantage in sensitive areas, consider using a deflector at the end of the spray nozzle to divert the spray away from non-target areas.

Vantage can be mixed with preemergent herbicides such as Surflan AS, if desired. Refer to the labels of both Vantage and Surflan for specific information as use sites and weeds managed.

Ground ivy problem

Ground ivy creeps into lawns from adjacent areas. We have been using three-way mixtures of 2,4-D, dicamba and MCP, with varied results. Any other options?

- WV

Ground ivy can present a serious problem if it is not managed properly. The plants produce new growth wherever their stems come in contact with the ground. The three-way mixture of 2, 4-D, Dicamba and MCP should work reasonably well. However, sometimes this perennial weed may be difficult to manage with a few applications. Ground ivy is considered to have "intermediate" susceptibility to the above mixture in some situations. That may explain why you are getting variable results.

Consider using products such as Turflon-II or confront. Read and follow label.

Garlic & onion control

How do I manage wild garlic and onion weeds in lawns? We have difficulty managing them with our regular program. We have used Trimec 899/3-Way with sporadic results. Appreciate your comments.

- MI

Both wild garlic and onion are difficult to manage. However, repeated applications of herbicides such as 2,4-D ester should help manage the weeds. 2,4-D ester is a selective, post-emergent herbicide. This means the target weeds, such as garlic and onions, must be actively growing. This product will not help you manage the weeds as a preemergent. A common problem is timing. If you apply herbicide treatments when the weeds are not present, your application will not have any effect on weeds.

Use caution when applying products such as 2,4-D ester herbicides near non-target desirable plants (vegetable garden plants, flowering plants, etc.) Ester formulations can volatilize and drift to nearby plants and cause injury. Therefore, avoid treating during windy conditions.

Read and follow label specifications for best results. **LM**

Next month: a look at mycorrhizae fungus products.



BALAKRISHNA RAO

Manager of Research and Technical Development for the Davey Tree Co. Kent, Ohio

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FMC

Tree damage from ice storms will take months to repair

By JAMES E. GUYETTE

The ice from this past winter's ice storms in the Northeast and New England is gone, and left in its wake a strong demand for arborists and for landscape companies experienced in tree work. Experts, however, are advising tree and landscape workers to not to take a slash-and-burn approach.

"Many trees may look like a total loss; however, many are only slightly damaged and can recover," says Chuck Gadzik, Maine Forest Service Director.

"For many of the trees that are damaged, simple pruning, if done correctly, is all that is required to bring them back around to health," says Sven Svenson, a nursery crops researcher at Oregon State University's North Willamette Research and Extension Center. "In many cases, severely damaged trees have already been removed and homeowners are looking at replacements."

Dr. Alex Shigo, a New Hampshire-based tree scientist, urges landscape managers to resist customers' urges to have trees cut down, when, in fact, they may be healthy or capable of complete recovery.

"The very people who moved here for the trees get excited and they may over-cut," Shigo notes, pointing out

that for rural residents a downed powerline usually means that the pump on the well won't work. "It's amazing how people adjust their thinking about trees when they can't flush for a second day."

"Property owners should not be in too much of a hurry to remove all damaged trees because many of them can be restored," according to Robert A. Bartlett Jr., president of Bartlett Tree Experts.

"This is usually much less expensive than removal and replacement—if you can get suitable replacements due to the huge demand that will be placed on local nurseries. Avoid going far afield for replacement trees and shrubs because many will not survive the rigors of a northern winter, with or without severe storms. Native stock has a much better chance than exotics from somewhere else."

Bartlett believes that clients need to realize that salvageable plants already on site can save many years of waiting for a replacement to reach the size and beauty of the original, as well as saving on the purchase price of the replacement.

Many species, such as oak,

red maple, ash and sycamore, usually respond well to corrective pruning and other procedures used to restore them. However, for all tree species, the age, health, growing conditions, and the final appearance must be considered when determining the

tation, especially in areas already under economic stress.

In regions where people have the funds to hire professional tree care, work may be available for skilled arborists. The important word here is skilled, says Lidie. This type of endeavor requires a thor-



suitability of a tree for corrective pruning and care.

"It is important to remember that damaged trees and shrubs are under stress and will attract harmful pests and disease organisms," according to Bartlett.

In New England, "For the next seven to ten years they'll still be doing some corrective pruning," predicts Steve Lidie, owner of the Arbour Barber Co. of Shortsville, N.Y. During the winter he went north to assist aid efforts and found much devas-

Experts are advising tree and landscape workers to avoid a 'slash-and-burn' approach to correct ice damage to trees.

ough knowledge of tree biology. In some storm-ravaged neighborhoods everybody is a tree expert, and for the most part "they're out of their league—most of them don't know what they're doing to the tree."

"People have planted things that may be colorful, cheap, and fast growing, but they have no strength," says Bob

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Obermire, supervisor of the Oregon Department of Agriculture's Nursery and Christmas Tree Program. "The branches are often brittle and they hold their leaves late into the winter. The leaves then get icy and that causes problems. If you have one of these types of trees near a power line, you can kiss your power good-bye during an ice storm."

Certain species of trees do hold up better to winter's fury than others. However, every individual tree is different, says Svenson, who adds that if the tree was planted in a poor location, was unhealthy, has not been properly pruned, or was simply in the wrong place at the wrong time, it could end up being severely damaged during an ice storm.

"Even the most storm resistant plant will succumb if it is in a particularly bad location," says Svenson. "It may make it through the worst storm one year, but another storm another year that isn't quite as bad could completely wipe

out the tree just because of the wind direction and other weather related things."

In general, Svenson says conifers are more resistant to ice storm damage than deciduous hardwood trees. But even with the conifers, there are differences.

"Firs and spruces are generally less damaged than pine trees would be," he says.

"When you move into deciduous trees, oaks, black walnuts, hickories—those trees that have harder wood and broadly spread branching habits rather than very narrow branching—will be more resistant to both wind and ice damage."

It is logical that the harder the wood, the better it holds up. As a rule, fast growing trees, like poplars, silver maple or willow, have weak, brittle wood that is easily damaged in storms.

"If you think through the process, you want a tree growing as healthy as it can but not too fast," says Svenson. Svenson lists most oaks,

hickories, some of the maples, and ginkgos as generally more resistant to damage in ice storms. European birches, Siberian elms, Bradford pears, and many silver maples are generally more susceptible to ice damage.

Prune ahead

That was a key lesson learned by Maine businessman Norman S. Elvin, president of G&E Roofing Co. Inc. of Augusta. From now on he's going to stick with a correct pruning program around the G&E headquarters. Critical utility lines were ripped off the building by falling tree limbs, which short circuited the enterprise's nerve center. Lack of power hung up the phone system and made the company's computer worthless. Even a portable generator couldn't coax a dial tone out of the downed landline.

Adds Gadzik, "I can't stress enough the importance of people using common sense and proper safety and business procedures when re-

moving hazard trees."

In the affected regions, opportunities exist for interested tree businesses. "The established tree industry in that area is going to do quite well," says Lidie. For companies wishing to help out, preparation is an important step. "There are a number of things to consider before crossing state lines to somebody else's turf," he cautions.

In addition to having a handle on all the local rules and regulations, an out-of-towner may be burdened by not having a dumpsite available that handles yard waste. Thus Lidie recommends that traveling companies align themselves with established local enterprises before heading north.

"If you don't know somebody up there I'd start out making some calls to the larger companies," Lidie says. You can say, "If you're swamped we'll give you a percentage off the top" for customer referrals. **LM**

TO REDUCE STORM AND ICE DAMAGE

Following these steps will not guarantee that your trees won't suffer storm or ice damage but it can increase the odds of tree survival and reduce the possibility of breakage and damage to the tree. However, it is also important to remember to identify any potential targets that could be damaged and consider those in any treatment decision.

• **Plan Ahead** - When selecting trees to plant choose trees which have strong wood and good growing habits. Some of the trees that appear to be more resistant to ice damage include: sweetgum, arborvitae or white cedar, bald cypress, black walnut, hemlock, ginkgo, Kentucky coffee tree, swamp white oak and white oak.¹

• **Proper Pruning** - This does not mean topping a tree in order to remove branches that could break nor removing most

of the canopy but, instead, thinning the canopy to allow wind to blow through the crown and removing dead, dying branches and branches with weak attachments and included bark. This reduces the possibility of breakage by removing limbs with a predictable potential for failure.

• **Cabling and Bracing** - This can be considered for trees which have landscape value to the owner (private, public, facility, golf course etc.). Candidates for this treatment may include larger trees which have characteristics which indicate failure potential, including brittle wood, co-dominant stems, major forks and/or narrow forks. The installation of cables and/or braces provides additional support to the tree structures.

¹ R.J. HAUER, M.C. HRUSKA AND J.O. DAWSON. 1994. *TREES AND ICE STORMS*, SPECIAL PUB 94-1, DEPT OF FOR., UNIV. OF ILLINOIS AT URBANA.




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Gore: EPA to work with Ag Dept. on FQPA of '96

WASHINGTON, D.C.

A memorandum from Vice President Al Gore gives professional pesticide-user industries hope that the U.S. EPA will not soon be banning organophosphate pesticides.

Gore on April 11 sent a memorandum to EPA Administrator Carol M. Browner and Agriculture Secretary Dan Glickman telling them to work together to implement the Food Quality Protection Act (FQPA) of 1996. The memo stressed that one of the purposes of the Act is to protect children's health, but it also urged the EPA to base any decisions it makes on pesticides on sound science. The EPA claims that low-level exposure to organophosphate pesticides could affect brain development in a fetus or young child.

Gore, in his memo, set out four principles for EPA to use in reaching its decisions:

- ▶ that they be based on

sound science,

- ▶ that farmers and other affected people be aware every step of the way,

- ▶ that there be a transition period and alternatives made available if any chemicals are banned,

- ▶ and that the public be consulted.

Gore's action appeared to be in response to mounting pressure from farm and food groups fearful that the EPA would ban that particular class of pesticides.

RISE (Responsible Industry for a Sound Environment), which represents speciality pesticide suppliers and end-users, welcomed Gore's directive. RISE said it was "encouraged about the Administration's call for broad stakeholder participation. We believe that broad and balanced participation is key to full and fair implementation of FQPA."

El Niño sows questions on seed crop, prices

The El Niño may affect both the availability of certain varieties of turfseed and the cost of bringing it to market.

Wet weather this winter and early spring in California, some of the Southwest and also parts of Florida delayed landscape projects. Meanwhile, spring's early arrival in most of the rest of the country caused landscape managers to struggle with the workload, particularly mowing.

"Now they're worried about how to keep it mowed, not when to seed it," says Tom Stanley at Turf-Seed Inc., in Oregon. "It's been too wet to get the equipment on."

The outlook this spring was for stable seed prices, says Stanley. The crop seemed to be in good shape. But other factors could surface as the season progresses. For instance, there's some concern that the crop will mature too soon.

"An early harvest is not necessarily a good harvest," reports Jack Zimmer of Seed Specialists in Coeur d' Alene, ID. "We need some drying to bring this crop around."

"The crop is maturing earlier than it has in previous years," adds John Cochran at Turf Merchants Inc. (TMI), Tangent, OR. "You can't really tell yet but there's an old saying, 'An early crop is a light crop.'"

"Many fields are in an advanced state of growth due to the warm, wet weather," adds TMI's Steve Tubbs. "This puts the crop on track to be earlier than normal, which historically has meant a light crop."

Turf seed producers say the coming several weeks hold the key to this year's crop. And, perhaps, to prices.

"Commodity prices are affected by speculation of what the demand will be, the actual demand, and unforeseen pressures such as drought or a poor crop. Since seed production is tied to weather, level of demand for a particular species or cultivar, acreage available for harvest and the clairvoyance of the growers, it's a risky business," says a spokesperson for the Albright Seed Company, Camarillo, CA.

Because of The El Niño it seems to be even riskier in 1998.

James E. Guyette

Handheld gasoline powered equipment outlook for 1998 foresees just modest sales increases

The Portable Power Equipment Manufacturers Association, a 19-member trade association, has released shipping information for 1997. Based on shipments of equipment for 1997, shipping demands for 1998 have been estimated.

Equipment	Units Shipped 1997	Change from 1996	Estimated Increase for 1998
Chain Saws	2,172,800	◊ 5.4%	◊ 1.5%
Trimmers/Brush Cutters	3,684,000	◊ 3.7%	◊ 3.0%
Hand Held Blowers	1,196,900	◊ 2.3%	◊ 2.0%
Backpack Blowers	188,000	◊ 7.0%	◊ 4.5%
Hedge Trimmers	276,000	◊ 18.5%	◊ 2.5%
Cut Off Saws	97,3000	◊ 12.5%	◊ 2.0%
Stick Edgers	47,000	◊ 14.5%	◊ 3.0%

Prescription soils cure turf ills

'Designer soils' — soils or root zone mixes blended with certain desired properties — are used to improve site conditions such as drainage, aeration and water retention.

by NORMAN W. HUMMEL JR., Hummel & Co. Inc.



An ample supply of a screened soil of the same texture is probably more important than the texture itself.

Last year, a major university had to replace two athletic fields that were little more than two years old. The school's new fields didn't drain, they were extremely hard, and the turf on these fields had very poor rooting.

The architects failed to properly design the soil or root zone mix for these fields, resulting in their failure. Unfortunately, this scenario plays itself out quite often on both athletic fields and golf course greens.

The physical properties of golf course greens and natural turf sports fields profoundly impact the performance of the turf growing on them. High performance turf-grass areas such as greens and sports fields demand free draining root zone mixes that have good compaction resistance and good aeration. In addition, sports fields have a special need for surface stability; an area where many very high sand media fail.

Designing soils to have certain properties is not new in the golf industry. Since the USGA specifications were first published in 1960, laboratory testing has been used to design root zone mixes or soils. The purpose of this testing is to design a mix that has desirable physical properties, such as good drainage, aeration and water retention.

The design process

The first step in designing a soil or root zone mix for an athletic field or green is to select your raw materials. Sands should be of the particle size shown in Table 1. There is not much room for compromise. Research has consistently shown that sand sized between 0.25 and 1.0 mm in diameter is most desirable for a free draining growing medium. Coarser, uniform sands are acceptable for athletic fields, and are desirable where soil will be in the mix.

Peats and compost vary immensely in quality. You should employ the services of a competent soil physical testing laboratory to test the quality of your organic matter source. The USGA recommends that a peat have a minimum organic matter content of 85 percent, which is a good guideline. We recommend that composts have a minimum organic matter content of 60 percent, are screened to ¼ inches, and are proven to be non-toxic to plants.

Soils are often added to sports field mixes, and occasionally to greens mixes. A small amount of soil can help stabilize an otherwise soft sand. Soils in the textural classes loam and sandy loams are preferred, but soils of other textures can be considered as well. An ample supply of a screened soil of the same texture is probably more important than the texture itself.

Different ratios of the raw materials are blended into different mixes for testing. The mix ratios tested are often based on the gradation of the sand, and the experience of the lab or soils consultant.

Using ASTM (American Society of Testing and Materials) test methods, a series of tests are run on the mixes to determine their physical properties. First, cores containing the mixes are compacted to a standard level. One of the first tests run on the compacted cores is the infiltration rate. Again, one of the goals of this testing is to design a mix that will drain, even under compacted conditions.

The total porosity is the percentage of a volume of soil that is the pores or voids between the sand grains or soil. Some of these pores are large in diameter, and conduct water under saturated conditions. When drained, these pores fill with air and provide oxygen necessary for root growth. These are called the aeration porosity.

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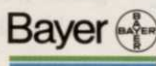
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Field capacity is the point where all gravitational water is removed from the soil by free drainage. The lab simulates field capacity by pulling water out of the cores at a known suction. Since the soil profile depth will effect the water retention characteristics of the soil, it is important that you tell the lab of the intended profile depth so that it can be better simulated. It is at this point that we determine the aeration and capillary (water filled) porosities. A nearly even distribution of air and water filled pore space after free drainage is ideal.

Table 2 lists the target ranges for the physical properties tested. These values can be further refined to reflect the climate and environment where the turf will be grown. The mix ratio that produces the most desirable physical properties should be duplicated in the field.

Quality control

The mix design is only the first step to a successful construction project. It is extremely important that steps be taken in the field to duplicate the best mix.

Recheck your sand to make sure that the particle size is consistent with what was sent to the lab. You don't want to pay \$6 to \$10 per ton of mix for organic matter and blending, only to find out later that the sand had



A properly designed soil or root zone mix will make it an easier job for you to meet the expectations of your customers.

TABLE 1. RECOMMENDED SAND PARTICLE SIZE FOR GOLF GREEN AND ATHLETIC FIELD ROOT ZONE MIXES

Size class	Sieve No.	Particle diameter	Athletic fields % retained	Golf Greens
fine gravel	No. 10	2.0	<5%	≤3%
very coarse sand	No. 18	1.0	5-20%	≤ 10% combined
coarse sand	No. 35	0.5	>60%	≥ 60% combined
medium sand	No. 60	0.25	combined	
fine sand	No. 100	0.15	0-15%	0-20%
very fine sand	No. 270	0.05	0-3%	0-3% 0-5%
silt and clay		<0.05	0-3%	0-8%

changed. Once blending begins it is important that the organic content of the mix is consistent with the approved lab-designed mix. We recommend that quality control checks be made every 500 to 1000 tons.

On site modification?

It sounds right: "if you add sand to a soil it should improve drainage, compaction resistance, and the aeration of the soil." Why is it then, that some of the worst fields we have tested or visited are where sand was incorporated into a soil?

The best explanation for these failures was offered by Dr. Art Spomer of the University of Illinois in articles published in 1980. In those articles, Dr. Spomer explains that when small amounts of sand are added to a soil, the sand grains 'float' in the soil and do not produce the large pores characteristic of sands. The sand provides no benefit in these small volume additions.

As more sand is added, the total porosity of the soil will decrease until you reach a threshold proportion. At this point, there is sufficient sand for there to be sand to sand contact. Unfortunately, there is also enough soil in the mix to completely fill the voids between the sand grains. It is at this point that the soil would probably be best for the base

of a road or parking lot, because it will pack very tightly. It is not a soil that would be suitable for an athletic field or green. You must get well beyond this threshold proportion to see improvement in the physical properties..

The amount of sand required to bring about this improvement will depend on the sand used and the texture and structure of the soil. A competent laboratory can identify this threshold proportion, and make sure that the designed soil is well beyond it.

Maintaining greens and athletic fields is

TABLE 2. PHYSICAL PROPERTIES FOR DESIGNED ROOT ZONE MIXES

Physical property	Recommended range
Total porosity	35-50%
Aeration porosity	15-30%
Capillary porosity	20-30%
Infiltration rate	6-24 inches/hour
Bulk density	1.35 to 1.60 g/cc

difficult enough with today's expectations for quality and high demand for use. A properly designed soil or root zone mix will make it an easier job for you to meet these expectations. The testing of a soil or mix will not guarantee that your greens or athletic fields will succeed, but it will greatly minimize the risk for failure. **LM**

The author is president of Hummel & Co., Inc., Turfgrass Soil Consulting and Diagnostic Services, Trumansburg, N.Y.

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Echo saw is powered by a 33.4 cc, two-stroke engine. Some saws have chain guards. Operator should stand on the side of the trunk opposite the limb being cut.



Deere CS series saws weigh in at about 10 pounds.

CHAIN SAWS

By CURT HARLER/ Contributing Editor

Dress for success when using a chain saw.

Safety goggles are a must to protect those baby blue eyes. A full face shield is better, as it protects the face from flying chips and reduces the likelihood of a sudden flinch which could misdirect a running saw toward other parts of the body.

Leather is the fashionable fabric for saw operators this season and any season. Anyone running a saw should have a pair of high-quality leather gloves with double palms. Some logging-supply catalogs offer heavy-duty gloves with Kelvar, the same fabric used in bulletproof vests. Although these gloves can cost over \$100, they make the statement that you're serious about protecting workers' fingers and hands.

Every landscape worker should own a good pair of heavy-duty work boots. Those who use saws should have leather boots with steel caps to protect from chain-saw cuts and from falling branches.

Top off the wardrobe with a good hard hat. It will protect the operator's head from falling limbs or branches. A properly fitted hat is cool, comfortable and has a good internal suspension to cushion the head from falling debris. Round out the look with a pair of OSHA-approved ear muffs. Since saws can easily exceed noise levels of 90-100 decibels, be sure anyone in the area is wearing earplugs.

Loose-fitting or flapping clothes are definitely "out". The operator should wear nothing which could potentially be caught up in the chain.

Accessories for the well-dressed saw operator include a good sharpening guide. A decent one will run about \$25. Make saw sharpening a regular part of the sawing routine. Do it at least once a day.

More than any other tool used in the landscaping business, the chain saw requires skill and training for proper operation. Safe sawing starts with the purchase of the saw. Look for saws with inertia-activated chain brakes. These are engineered to stop the saw instantly and reduce the chances of serious "kick-back" injury.

Buy a saw with an anti-kick nose guard, quick-stop brake and a full wraparound hand guard. Kickback, caused when a



Shindaiwa 448

saw hits an obstruction, accounts for over 30 percent of chain saw accidents.

Pick up a saw and test its weight and balance. Make sure that all controls are simple to operate and easily accessible. There should be no sharp corners or protruding parts on the motor housing, which have a way of grabbing on clothes. The muffler and other key parts should be enclosed.

The muffler exhaust should be directed away from the operator's face. Several other features are worth having. Spark arresters are required in some areas of the country. They keep sparks from being thrown by the exhaust. A safety tip covers the chain as it passes around the nose of the guide bar. It reduces the chance of kickback by keeping the chain from contacting anything at the guide bar tip. Throttle lockout guards against unexpected saw chain motion. Buy a saw with a good vibration reduction system, to reduce operator fatigue.

Do not allow an operator to make cuts with the saw between his legs. It is also bad form to straddle the limb being cut. Be aware of the direction the chain will go if it breaks, and keep people clear of this area.

Some saws have chain guards. The operators always should stand on the side of the trunk opposite the limb being cut.

The following are some of the leading chain saw suppliers and the products they sell.

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The CS-6700 saw from Commercial Landscape Supply, Irvine, CA has an Echo 66.7 cc 2-stroke engine with Pro-Fire Electronic Slope



Be aware of the direction the chain will go if it breaks.

advanced ignition system. It automatically senses engine speed, then advances ignition timing for optimum cutting power. The chainsaw has a fuel capacity of 21 ounces and oil capacity of 10.5 ounces. Unit comes with a standard 24-inch bar and chain. Optional 16, 20 and 27-inch bars are available.

JOHN DEERE

800-537-8233

Circle No. 251

The 200CS, 230CS and 300CS from John Deere, Research Triangle Park, NC, weigh in at about 10 pounds, but are tough enough for everyday use. With engines rated at 2.0 and 2.3 cubic inches, the 200 and 230 can be equipped with 12, 14 or 16 inch guidebars. Both have electronic ignition and the Safe-T Tip anti-kickback device. The 300 has a 3 cubic inch engine and an 18-inch Power Tip guide bar that cuts at 9000 to 9500 rpm.

ECHO, INC.

847-540-8400

Circle No. 252

Buy the CS-3450 chain saw from Echo, Lake Zurich, IL and get the protective carrying case, quart

of bar and chain oil and an extra loop of chain in the package. Saw is powered by a 33.4 cc two-stroke engine with ProFire electronic ignition. It features a fuel capacity of 8.5 ounces, oil capacity of 5 ounces, yet weighs just 7.8 pounds. It comes with a 16-inch bar standard. It is backed by a one-year commercial-use warranty.

HOMELITE

704-588-3200

Circle No. 253

Homelite's 3300 series offers four models with either 33cc or 38cc PowerStroke engines to meet a variety of needs. All models feature a precision-honed vertical cylinder for increased cutting power, engine durability and fuel efficiency; a large, sealed muffler for noise reduction; a dual stage air filter for peak performance. The 3300 series has Homelite's patented Safe-T-Tip anti-kickback device that actually eliminates kickback completely, according to the company. Kickback bars are available in 12- or 18-inches, depending on model.

HUSQVARNA

800-GET-SAWS or

800-438-7297

Circle No. 254

The Husqvarna 371XP weighs 13 pounds, yet offers a 70.7 cc engine that develops 5.4 hp. This saw handles big jobs. It can be used with bars up to 32 inches, and features all of the vibration and noise reduction features a pro would expect. Also available from the Charlotte, NC firm is the handy 257, a 3.7 hp 57 cc model that weighs 5.6 pounds.

MCCULLOUGH

520-574-1311

Circle No. 255

The ProMac line of saws from McCulloch, Tucson, AZ are designed for extensive use. The 3805AV-18 has an 18 cc engine with 18-inch bar, anti-vibration system. The unit weighs 12 pounds and has a fuel capacity 10.5 ounces. The 5000AV has a 50 cc engine and works with bars from 16 to 20 inches. Weighs 11.9 pounds.

RED MAX

770-381-5147

Circle No. 256

A full line of Pro Series chain saws is available in the RedMax line from Komatsu Zenoah America,

Norcross, GA. The 14-inch bar G310TS weighs 7.3 pounds dry. Its larger brothers include the G455AVS with 16 inch bar at 10.7 pounds; the G561AVS available with 16, 18 and 20 inch bars at 14.3 pounds; and the top-of-the-line G621AVS, which comes with 16, 18, 20 or 24 inch bar and a base weight under 15 pounds.

SHINDAIWA

800-521-7733

Circle No. 257

Commercial users can choose more than just the type of saw they need when they look at the 488 line of chain saws from Shindaiwa, Tualatin, OR. They can choose the protection and power needed for dusty conditions by buying the advanced PowerPro air filter. Other features include 2.9 cubic inch displacement, adjustable automatic oil pumps that regulate oil consumption.

SOLO, INC.

757-245-5531

Circle No. 258

A powerful 36.27 cc engine drives the 636 chain saw from Solo, Newport News, VA. The unit delivers 2 hp and features a top speed (with bar and chain) of 11,500 rpm. Inertia-matic chain brake, inboard clutch, and carburetor with all-position diaphragm and primer make this an easy-to-run machine.

STIHL

754-486-9100

Circle No. 259

Commercial-grade chain saws and accessories are available from Stihl, Virginia Beach, VA. Top of the line is the O19T with an exclusive curved side handle that allows the operator to trim trees in various positions. Unit's center of gravity is at the throttle trigger, making it well balanced for easy operation. Unit weighs 8.9 pounds.

TANAKA INTERNATIONAL

253-395-3900

Circle No. 260

The ECS-3301 from Tanaka, Kent, WA weighs just 7.3 pounds and features a new air filtration system that removes more particles from the air intake system for increased performance and engine life. The 32.3 cc inch engine develops 1.6 hp. Either a 12 or 14 inch Oregon bar and chain combination is recommended. **LM**

Disease management in landscape ornamentals

Plant health and quality take forethought and time but is a necessary step in the protection of our investment in the landscape.

By JOHN WATKINS, Ph.D./University of Nebraska

Landscape ornamentals represent a considerable investment to a property owner. It's much less costly to prevent disease injury to landscape plants than it is to replace them.

Plant selection

Do your homework before purchasing landscape plants. Become knowledgeable in the basics of plant disease i.e. how diseases develop, the common landscape plant diseases in your geographic area, how environmental stress interacts with the host and potential disease threats and the control measures available for combating the various diseases.

Plant selection encompasses two aspects of disease management. One, know your plant material. When plants, not well adapted to a geographic area, are exposed to an inhospitable environment, stress results. Chronic stress in a landscape plant often predisposes it to infection by disease-causing bacteria or fungi. Many of these organisms are opportunists that

have difficulty infecting healthy, vigorously growing plants but can become deadly invaders of stressed plants. If a certain tree or shrub is not adapted to your geographic area, don't put it in the landscape.

In my geographic area of the Great Plains, iron chlorosis is a chronic problem in certain landscape sites and plants because, in our high pH soils, iron is less available. Pin oak, a popular landscape tree, suffers because of iron deficiency. It's difficult to modify the soil with enough organic matter or sulfur to lower the pH and drilling holes in the trunks of chlorotic trees to inject iron is unsightly and may promote internal decay of the heartwood. You can avoid the hassle, expense and problem by simply not planting pin oaks in high pH soils.

Another example of a problem landscape tree in certain geographic areas is sycamore. Sycamore is a beautiful tree but anthracnose is a chronic disease that may greatly detract from the tree's value as a landscape plant. Before you plant sycamore give some thought as

to developing a tree health management plan.

Roses and flowering crabapples are popular landscape ornamentals in both residential and commercial landscapes. When the homeowner or landscape manager selects a variety based only on aesthetics the headaches begin. Black spot and powdery mildew can devastate a rose garden and apple scab, fireblight or cedar apple rust can make your flowering crabapple or hawthorn look far different from that picture in

Correct diagnosis

Correct diagnosis is basic to maintaining plant health, but recognizing an infectious disease on ornamentals can sometimes be difficult. With certain diseases such as tar spot of maple or rust on quaking aspen, symptoms are specific, but with others, such as ash anthracnose, they may be non-specific. Sometimes non-specific symptoms of an infectious disease resemble those of environmental stress making a determination more difficult.



Powdery mildew on rose

the garden seed or landscape catalog. When you plant a disease susceptible variety, you lock yourself into an expensive and time consuming fungicide spray program just to maintain the health and aesthetic value of that plant.

With many of our landscape ornamentals, disease-resistant varieties are available, and by choosing one of these both you and your plant will be much happier.

Cultural practices

► **Fertilization**—Don't promote lush growth with heavy applications of nitrogen. Develop a balanced fertility program.

► **Irrigation**—Provide adequate water for your plants but don't overwater. Avoid overhead irrigation. For trees irrigate at the drip line.

► **Location**—Don't crown



Pine tip blight on Austrian pine

plants. Provide winter and summer protection for sensitive ornamentals.

► **Pruning**—Make pruning cuts in healthy tissue well below infected areas. Preferably, prune when the tree or shrub is dormant.

► **Mulch**—Mulching around trees and shrubs protects the plants from mower injury and maintains a moist soil environment. Pull mulch away from the base of tree trunks.

► **Insect and Weed Control**—Weeds may harbor viruses that can be transmitted by insects to ornamentals in flower beds.

► **Removal**—Remove diseased flowers from the ornamental bed when symptoms are first noticed.

Chemical Control

Careful plant selection and good cultural practices can reduce the dependency on chemicals for disease control. However, when incorporated into a holistic plant health manage-

SOME CHEMICALS FOR DISEASE MANAGEMENT IN LANDSCAPE ORNAMENTALS

Bordeaux mixture, fixed copper

Dormant application for anthracnose, general protectant for certain leaf spots and blights

Fosetyl-AI (Aliette WDG)

Phytophthora root rots

Chlorothalonil (Daconil Ultrex)

Broad spectrum protectant for anthracnose, leaf and petal blights and needle casts

Quintozene (Terrachlor, PCNB)

Root and stem rots

Triforine (Funginex)

Rose black spot, powdery mildews, rusts

Iprodione (Chipco 26019)

Botrytis blight, Rhizoctonia leaf and stem diseases

Triadimefon (Bayleton)

Rusts, mildews and certain

leaf spots and blights

Maneb/Mancozeb

General protectant for rust and leaf spots

Propiconazole (Banner MAXX)

Apple scab, powdery mildew, leaf spots and blights on certain ornamentals

Thiophanate-methyl (Cleary's 3336)

Rhizoctonia root and stem diseases, certain leaf spots and blights, Botrytis blight

Agrobacterium radiobacter (Galtrol)

Biological control for crown gall

Fenarimol (Rubigan)

Powdery mildew, apple scab, rusts and black spot

Sulfur

Organic fungicide for powdery mildew

Streptomycin (Agri-Strep)

Control of bacterial diseases such as fireblight

Propamocarb (Banol)

Soil drench for Phytophthora and Pythium root rots

Metalxyl (Subdue MAXX)

Soil drench for Phytophthora and Pythium root rots

Chloroneb (Terraneb SP)

Soil drench for Pythium, Rhizoctonia and other root and blight diseases

Myclobutanil (Eagle)

Systemic fungicide for rusts and powdery mildews

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ment program, rather than a "spray and pray" approach, fungicides provide the landscape manager with an effective disease control tool. Correct diagnosis of the disease leads to selection of the right chemical.

Apply the chemical so that all plant surfaces are covered. If the foliage being sprayed is hairy, you may need to add a spreader-sticker to the spray mix. Timing is critical, not only for the initial application but for

follow-up repeat applications as well. Weather, plant growth and other factors affect residual activity of the chemical. Labels will give repeat application guidelines. **LM**

SYMPTOMS OF DISEASES OF LANDSCAPE ORNAMENTALS

Disease

Fungus leaf spots

General Symptom

Distinct spots that vary in size, shape & color

Bacterial leaf spots

Water-soaked spots that drop out

Anthracnose

Leaf spots and blotches and twig dieback

Cankers

Discolored branches, open wounds or branch dieback

Wilts

Yellowing and dieback of foliage, dark streaks in vascular tissue

Rusts

Yellow to orange pustules on leaves and twigs

Mildew

Grayish white powdery coating on leaves, distorted plant parts

Galls

Tumor-like growths on plant parts

Root rots

Wilting and dying of plants, discolored roots

Fireblight

Scorched appearance of shoots, blossoms and/or fruit

Scabs

Black to dark green circular lesions on leaves and fruits

Blights

Non-specific dying of leaf and flower tissue

Mosaic viruses

Mosaic pattern of lightgreen, dark green and yellow on leaves

in cool-season turfgrass

The goal of every turfgrass manager should be to create a healthy turfgrass ecosystem. This can be a challenge since growing seasons in the northern latitudes are never the same.

By JOHN E. WATKINS/
Ph.D. University of Nebraska

Anyone that has ever taken a soil microbiology course comes away with a new appreciation of the abundance of microbes in the plant/soil rhizosphere.

The rhizosphere is that microenvironment in soil influenced by plant roots. One pound of soil and roots may contain over 900 billion organisms—bacteria, fungi, actinomycetes, nematodes, insects, etc. With that many organisms within the root zone of your turfgrass plants, you often wonder how anything survives. Fortunately for the turfgrass manager, only a few of the microbes in the rhizosphere cause disease; many benefit plant growth by keeping disease-causing microbes under control. There's a delicate coexistence between the good and the bad microbes in the turfgrass rhizosphere. When this balance is altered, disease can result.

Turfgrass diseases result from the complex interaction of pathogen, host and environment. Turfgrass management practices can affect all three, greatly influencing disease development. Those practices that favor vigorous, but not lush, grass growth and are detrimental to growth of the pathogen result in less disease injury to the turf. Good turfgrass management is an effective disease deterrent.

The goal of every turfgrass manager should be to create a healthy turfgrass ecosystem. This is a challenge since growing seasons in the northern latitudes are never

the same. In 1996 the Northern Plains were relatively cool and wet. 1997, however, was just the opposite—hot, dry and windy. Because each season is different and because the relationship of host, pathogen and environment are so ecologically interwoven, disease predictions are difficult.

Let's examine some of the more common and damaging diseases of cool-season turfgrasses.

Leaf spot and melting out are two fun-



Dollar spot injury to ryegrass is most prevalent when days are warm, nights are cool.

gal diseases within the old group known as "Helminthosporium" leaf, crown and root diseases. The leaf spot pathogen, *Bipolaris sorokiniana*, attacks bluegrasses, bentgrasses, ryegrasses and fescues. Melting out, caused by *Drechslera poae* is a serious disease of Kentucky bluegrass and also occurs on ryegrasses and fescues. Both diseases are favored by dry periods alternating with

prolonged cloudy wet weather. The range of pathogen activity is from 65°F to 85°F. Early disease symptoms are small dark brown spots on the leaf blade or leaf sheath. As the disease progresses, the spots enlarge causing the infected leaves to yellow and the affected turf to appear chlorotic and thin.

Widespread use of improved turfgrass cultivars with good resistance to leaf spot and melting out has significantly lessened the impact of these diseases on turfgrass quality. The dependency on rescue fungicide treatments can be drastically reduced through good cultural practices. These include a fertilization program that does not stimulate lush growth in May, thatch management and using a preventive fungicide program on susceptible turfs.

Dollar spot, caused by *Sclerotinia homeocarpa*, occurs when days are warm and nights are cool. The presence of dew and high humidity in the turf canopy are ideal conditions for dollar spot. On turfs maintained at 1 to 3 inches, symptoms are a mottled, light tan pattern made up of 4- to 6-inch patches of blighted turf. Individual leaf blades will develop a lesion that may be up to an inch long, is light tan with reddish-brown margins and often spans the width of the blade. If the turf looks as though it's covered with small cobwebs in the mornings, that's probably *S. homeocarpa* mycelium.

Dollar spot often can be prevented without the use of fungicides or with minimal fungicide application. Maintaining vigorous growth during the season helps the turf outgrow the infection and recover quickly when it is infected. If needed, a fungicide can be applied at the first appearance of dollar spot.

Two of the most destructive patch diseases of cool season turfs are **necrotic ring**

spot, caused by *Leptosphaeria korrae* and **summer patch**, caused by *Magnaporthe poae*. Necrotic ring spot generally occurs on Kentucky bluegrass during spring and fall, and summer patch during July and August. Summer patch devastated lawns in the central plains in 1997 because of record high temperatures and low rainfall. Distinguishing between the two diseases is difficult as both produce doughnut-like patches in affected turf. The dead grass is light tan and matted, and many of the patches will have a tuft of healthy grass in the center.



Summer patch in Kentucky bluegrass

The key to effective management of these two persistent diseases is in promoting root health through timely fungicide treatment and minimizing stress dur-

ing the hot periods of the summer. These diseases are like a bad headache. They go

away periodically but always return during periods of stress. On established turf, the key to prevention is to avoid management practices that promote rapid top growth at the expense of root development. Reduce thatch, fertilize properly and water more frequently when the disease is active. Apply a systemic fungicide with high volumes of water to drench the chemical into the root zone. Make the first application in May with a second one in June.

Brown patch, caused by *Rhizoctonia solani*, occurs on Kentucky bluegrass, tall fescue and perennial ryegrass during midsummer's heat and humidity. The disease is identified by the presence of patches of dead and dying grass. The

PREVENTIVE AND CURATIVE FUNGICIDE PROGRAMS FOR MAJOR DISEASES OF COOL-SEASON TURFGRASSES

Disease	Preventive/ Curative	Initial application	Products
Leaf spot/melting out	P	May	chlorothalonil, iprodione, mancozeb, propiconazole, vinclozolin
Stripe smut	P	April or October	cyproconazole, fenarimol, flutolanil, propiconazole, thiophanate-methyl, triadimefon
Necrotic ring spot	P	When soil temperatures reach 60°F at 2" depth	azoxystrobin, cyproconazole, fenarimol, iprodione, thiophanate-methyl
Fairy ring	C	At first symptoms of green ring	flutolanil
Dollar spot	P/C	June for ryegrass and bentgrass	chlorothalonil, cyproconazole, iprodione, mancozeb, propiconazole, thiophanate-methyl, triadimefon, vinclozolin
Brown patch	P/C	June for ryegrass and bentgrass	azoxystrobin, chlorothalonil, cyproconazole, flutolanil, iprodione, propiconazole, thiophanate-methyl, triadimefon, vinclozolin
Summer patch	P	When soil temperatures reach 65°F at 2" depth	azoxystrobin, cyproconazole, fenarimol, propiconazole, thiophanate-methyl, triadimefon
Pythium blight	P	June	azoxystrobin, chloroneb, ethazol, fosetyl-Al, metalaxyl, propamocarb
Rust	P/C	July	chlorothalonil, cyproconazole, mancozeb, propiconazole, triadimefon
Typhula blight	P	October/November	chlorothalonil, cyproconazole, fenarimol, flutolanil, iprodione, PCNB, propiconazole, triadimefon, vinclozolin
Microdochium patch	P	October/November	azoxystrobin, chlorothalonil, cyproconazole, fenarimol, iprodione, PCNB, propiconazole, thiophanate-methyl, triadimefon, vinclozolin

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patches are roughly circular. Green plants within the diseased patches have leaf spots that are long, gray lesions surrounded by a dark brown margin.

The presence of dew and high humidity in the turf canopy are ideal conditions for dollar spot.

Control thatch and maintain an adequate nitrogen fertility program during the growing season. Don't overdo it with the nitrogen, but don't starve the turf either. Apply a fungicide to susceptible turfs at the first appearance of brown patch symptoms.

Pythium blight is caused by several species of *Pythium* fungi. In turfgrass they survive in thatch and soil. All turfgrass species are susceptible to attack by these fungi. The two most important criteria for disease occurrence are poor surface drainage and a wet grass canopy. These along with high relative humidity and day temperatures above 90°F with warm nights, provide an ideal environment for an outbreak. Environmental conditions are key to this disease. When it's cool and dry, no disease, but when it's hot and humid, look out. Early symptoms are small brownish spots that suddenly appear, especially in drainage channels, within the turf. These many form into larger areas where the in-

TURFGRASS FUNGICIDES GROUPED BY CHEMISTRY

Fungicide class	Common name	Examples of some trade names
Aromatic hydrocarbons	Etridazole	Koban
	Chloroneb	Teremec SP
	PCNB	Turficide
Benzimidazoles	Thiophanate-methyl	Cleary's 3336 Fungo Systec 1998
Carbamates	Mancozeb	Fore
	Propamocarb	Banol
	Thiram	Thiram
Carboximides	Flutolanil	ProStar
Dicarboximides	Iprodione	Chipco 26019
	Vinclozolin	Curlan, Vorlan
Nitriles	Chlorothalonil	Daconil 2787 Daconil Ultrex Daconil Weather Stik
Phenylamides	Metalaxyl	Subdue Maxx
Phosphonates	Fosetyl-Al	Aliette Prodigy Aliette Signature
Sterol biosynthesis inhibitors (DMIs)	Cyproconazole	Sentinel
	Propiconazole	Banner Maxx
	Triadimefon	Bayleton
	Myclobutanil	Eagle
Pyrimidine (DMI)	Fenarimol	Rubigan
B-methoxyacrylate	Azoxystrobin	Heritage

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dividual spots have merged. Infected leaves appear water-soaked and feel slimy to the touch. In the early morning hours, the turf may contain masses of fungal mycelium resembling a fluffy cotton ball. Sometimes the affected turf will give off a fishy odor. Place a plug of the affected turf in a sealed plastic bag overnight and then smell the results.

No single control measure will provide complete protection against an outbreak of Pythium blight. Turf managers must employ a combination of good management, early disease detection, and preventive fungicide treatment to avoid serious turf injury. Provide good surface and subsurface drainage and promote good air movement across blight-prone areas by pruning landscape plantings. The best fungicide strategy is one of prevention. When temperatures

and humidities are forecast to reach into the 90's with warm nights, it's time to treat.

Rust diseases, caused primarily by *Puccinia* spp., occur on all commonly grown turfgrasses. The severity of rust outbreaks varies from year to year. Kentucky bluegrass, perennial ryegrass and tall fescue are the cool season grasses most affected by rusts. In the Great Plains and Rocky Mountains, rust usually occurs from mid to late summer until early October. It becomes severe when lack of water, low fertility or soil compaction reduce turf growth. Warm days and moderate night temperatures along with long dew periods create optimal environmental conditions for rust.

Heavily rusted turfs appear yellow or orange when seen from a distance. If still in doubt, put on a pair of white shoes and walk across the turf. If it's rusty, they'll



Melting out of Kentucky bluegrass

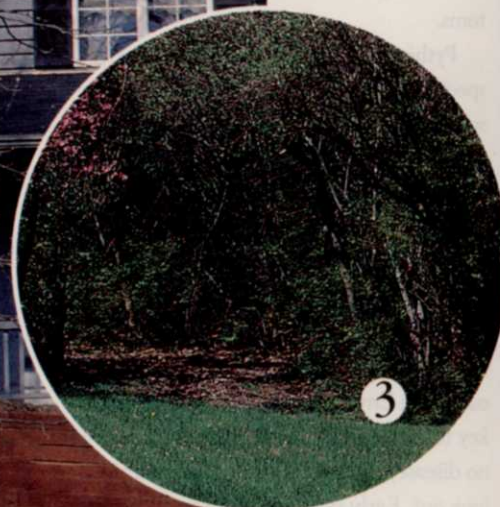
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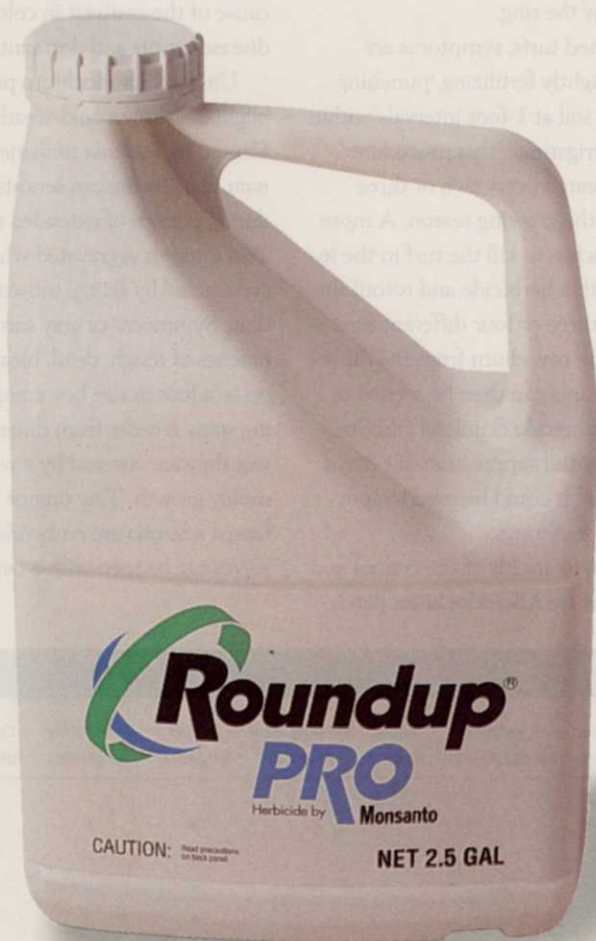


4

1

When you're thinking of ways to expand your business and boost profits, Roundup® Pro herbicide may be your most useful tool. Roundup Pro can solve almost any lawn care problem you can think of. And it can create some opportunities that may surprise you.

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1 GIVE NEW LIFE TO LAWNS

Take out areas of old worn, damaged grass or an unsightly varietal mix and start with a clean slate. The control you get from Roundup Pro gives new turf a healthy start. The perfect first step in a total or partial lawn renovation and to long-term relationships with customers.

2 ZAP 'EM AND WHACK 'EM

First, zap weeds with Roundup Pro; wait three days for it to move into the roots; then whack 'em with a string trimmer while they're still green. You'll get fast, effective results in hard-to-reach places. Plus, Roundup Pro gives you complete control—roots and all—with no regrowth.

3 BANISH BACKYARD BRUSH

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4 MASTER MULCH BEDS AND TREE RINGS

Enhance landscapes and add to the natural beauty of the surroundings. It's easy to create mulch beds around trees, shrubs and ornamentals. Just use Roundup Pro to control the vegetation in these areas, then cover with mulch. Spot treatments keep them beautiful and beat hand-weeding, hands down.

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- Turf Renovation.
- Questions & Answers About Roundup Pro.
- Roundup Pro In The 21st Century.
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turn orange. Close examination of rusted leaf blades reveals the presence of orange to brick-red pustules. Spores within these pustules rub off easily when touched. Each pustule is capable of producing over a million rust spores. Under ideal conditions turf can become heavily rusted about 40 days after initial infection.



Fairy ring injury to a home lawn. Rings most severe in sandy, low-fertility soils.

Rust management begins with the use of improved rust-resistant cultivars. Maintaining vigorous growth throughout the growing season by supplying a consistent source of nitrogen and alleviating compaction will lessen the rust severity. Fungicides may be needed in certain years with the initial application in early July followed by one or two additional treatments at three-week intervals.

The life cycle of fairy ring-forming mushrooms is similar to that of other common mushrooms. Fairy ring fungi survive as dormant spores or mycelium. This mycelium becomes active during moderate, wet weather; and the ring continues to grow outward each year. Following rains, mushrooms appear within the dark green ring or at the edge of the dead area. Fairy rings usually are most severe in sandy, low fertility soils low in moisture. The mushrooms grow on decaying organic matter such as a thick thatch. Typically, fairy rings

are found as circular patterns of thin or dead grass within a dark green ring of lush grass. The concentric ring of thin or dead grass is the result of drought stress caused by the dense mat of fungal mycelium present just below the ring.

In established turfs, symptoms are "masked" by lightly fertilizing, punching holes into the soil at 1-foot intervals within the ring and irrigating. This procedure should be repeated every two or three weeks during the growing season. A more drastic approach is to kill the turf in the infested area with a herbicide and rototill the entire area in three or four different directions to mix the mycelium from the different rings. The area can then be seeded or sodded. The fungicide flutolanil (ProStar) is registered for the suppression of certain fairy ring fungi. It could be used to spot treat problem fairy rings.

Principle snow molds of the central and northern plains are *Microdochium* patch

(pink snow mold) and *Typhula* blight (gray snow mold). *Microdochium* patch, caused by *Microdochium nivale*, can injure turf anytime from mid October to April during prolonged cool, wet weather. Infection most often occurs with temperatures between 32°F and 50°F, during cold fogs, or in a light drizzle.

Symptoms of pink snow mold are roughly circular rusty brown patches with a salmon-pink moldy growth visible at the edges of the patches. The scattered spots are easily detected, even in midwinter, because of the contrast in color between the diseased spots and dormant turf.

Unlike *Microdochium* patch, *Typhula* blight is strictly a cold-weather disease. Caused by *Typhula ishikariensis* or *T. incarnata*, this disease can seriously injure turf during periods of extended snow cover. Turf injury is aggravated when the snow is compacted by skiing, snowmobiling or sledging. Symptoms of gray snow mold are patches of rough, dead, bleached-tan areas up to a foot in size becoming visible as melting snow recedes from diseased areas. When wet they are covered by a whitish-gray moldy growth. Tiny orange to red to black fungal sclerotia are embedded in infected leaves can be seen with a hand lens. **LM**

TURF DISEASE MANAGEMENT GUIDE

Disease	Resistant varieties	Proper fertilization	Thatch management	Aerification	Improved drainage	Improved air circulation	Snow fencing	Mowing until dormant	Proper irrigation	Preventive fungicides	Curative fungicides	Till the area
Leaf spot/melting out	x	x	x	x					x	x		
Dollar spot	x	x	x	x					x	x	x	
Brown patch	x	x	x	x		x			x	x	x	
Summer patch		x	x	x					x	x	x	
Necrotic ring spot		x	x	x					x	x	x	
Pythium blight		x	x	x	x	x				x	x	
Rusts	x	x						x	x	x		
Fairy rings		x	x	x							x	x
Snow molds		x	x	x			x	x		x		

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Tom Mieval, General Manager, of a major Cleveland, Ohio lawn care company.

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in warm-season turfgrass

The common southern turfgrass diseases have distinctive symptoms, and are easy to predict based on temperature and moisture conditions. Reduce traffic, watering and thatch, and use appropriate control products for a combined defensive strategy.

by GARY W. SIMONE, PH. D.,
University of Florida

The fall overseeding period on bermudagrass in golf courses and other recreational sites has had an increasing incidence of *Leptosphaerulina* blight.

This disease has been a minor leaf blight affecting such cool season grasses as annual and perennial ryegrass, annual bluegrass, creeping bentgrass, fine leaf fescues, and Kentucky bluegrass. The causal

fungus, *Leptosphaerulina australis*, has commonly invaded senescent or stressed leaf tissue in the past. Recent years have seen an increased incidence of this disease on rye/bentgrass overseeds and not necessarily on old or stressed tissue.

Leptosphaerulina blight begins on leaf tips, producing a yellowing that pro-

gresses down toward the sheath. Affected tissue develops a reddish-brown color prior to the necrosis and shriveling of affected leaves. The fungus does not appear to invade the crown nor roots of the overseed. Affected turf areas have a patchy appearance, exhibiting a reddish color similar to that caused by cold wet soils and restricted phosphorus

uptake. Close examination with a hand lens will reveal the brown-to-black, embedded sexual reproductive structures in shriveled leaf tips. The fungus has been known to invade bermudagrass in the absence of an overseeded species. *Leptosphaerulina* likely survives as mycelia in thatch and in the sexual bodies (perithecia) in either debris or soil. Recent dramatic shifts in rainfall due to El Niño may have much to do with incidence of *Leptosphaerulina* in overseeded grasses and in bermuda.

St. Augustinegrass is still suffering from the widespread incidence of take all root rot caused by *Gauromannomyces graminis* var. *graminis*. However, an increasing number of summer decline samples from urban lawn sites are not associated with take all root rot disease. Samples processed in the Florida Extension Plant Disease Clinic are revealing the presence of *Rhizoctonia zaeae* – a causal fungus of leaf and sheath spot on bermudagrass. This disease is similar in appearance to take all disease on St. Augustinegrass but with less root destruction. Turf professionals comfortable with visual identification of take all patch by appearance and timing, are encouraged to take an occasional sample and forward to a diagnostic clinic for verification. Turf sites invaded by *Rhizoctonia zaeae* are treatable situations.

Some Familiar Foes

Algae – These are not truly pathogenic on turf but have an adverse impact on turf quality due to competition. The blue-green algae are the primary culprits, invading partially shady sites with high moisture and a freely available nitrogen source. Algal growth produces a slippery condition on the turf and may become so dense that it can prevent irrigation from reaching the root zone. Improving soil drainage and air circulation coupled with verticutting areas with algal mats will aid in management.

Anthracnose – Incidence has been low on centipede grass due to the mild winter conditions throughout much of the Southeast. Areas with disease are correlated to either poor fertility conditions or nematode populations. Minimizing stress conditions greatly reduces anthracnose development.



Bermudagrass with decline symptoms

(PHOTO COURTESY T. FREEMAN)

Bermudagrass decline – Pursue lab diagnosis to verify decline and separate this disease from similar appearing localized dry spots (fairy rings) and Rhizoctonia leaf and sheath spot disease. Raise mowing height by 50% to increase photosynthetic area and top dress greens frequently. Fungicide use is primarily preventative.

Brown Patch – This spring/fall disease is most aggressive between 75-85°F. Disease is favored by thatch, excessive soil moisture and readily soluble nitrogen sources. De-thatch severely affected areas, apply slow release N sources and water deeply but infrequently.

Cottony Blight – Excessive rainfall in the fall through spring period (1997-98) has resulted in a



St. Augustinegrass with take all root rot disease.

higher incidence of cottony blight in overseeded situations. Many greens and tees developed patches or streaks of greasy-green invaded turf as the fungus

FUNGICIDE MANAGEMENT FOR WARM-SEASON TURFGRASSES

Disease	Common Fungicides	Comments
Algae	Chlorothalonil, mancozeb, maneb	Reduce watering and verticut algal mats
Anthracnose	Chlorothalonil, cyproconazole, propiconazole, triadimefon	Minimize thatch
Bermudagrass decline	Azoxystrobin, fenarimol, myclobutanil, propiconazole, thiophanate methyl, triadimefon	Preventative use and azoxystrobin has curative potential for golf course and sod farms
Brown patch	Azoxystrobin, chloroneb, chlorothalonil, cyproconazole, fenarimol, flutolanil, iprodione, maneb, mancozeb, myclobutanil, PCNB, propiconazole, thiophanate methyl, thiram, triadimefon	Mow into infested sites last and collect clippings to minimize mower spread
Cottony blight	Chloroneb, etridiazole, fosetyl aluminum, mancozeb, mefanoxam, propamocarb	Minimize traffic and irrigation on infested sites
Dollar spot	Chlorothalonil, cyproconazole, fenarimol, iprodione, mancozeb, maneb, myclobutanil, PCNB, propiconazole, thiophanate methyl, thiram, triadimefon	Minimize thatch and achieve a balanced fertility for long-term control
Fairy ring	Flutolanil	Some success with puffball caused rings from shallow depths
Gray leaf spot	Chlorothalonil, propiconazole	Repeated applications during rainy period needed
Helminthosporium spots	Chlorothalonil, iprodione, mancozeb, maneb, myclobutanil, PCNB, propiconazole, vinclozolin	Minimize thatch
Leptosphaerulina blight	Chlorothalonil, iprodione, vinclozolin	
Pythium root rot	Chloroneb, etridiazole, fosetyl aluminum, mefanoxam, propamocarb	Avoid excessive irrigation; Foliar fertilization may help
Rhizoctonia leaf and sheath spot	Chlorothalonil, flutolanil, iprodione, mancozeb, PCNB, thiram	Can be confused with decline and fairy ring or take all root rot
Rust	Cyproconazole, mancozeb, maneb, propiconazole, triadimefon	Usually not needed for control
Take all root rot	Fenarimol, myclobutanil, propiconazole, thiophanate methyl, triadimefon	Preventative use only



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moved readily with surface water or traffic movement. Improve air circulation and drainage and restrict traffic across infested sites.

Dollar Spot – Although considered a disease of cool to warm weather (60-80°F), heat-tolerant strains of the fungal pathogens do exist along the Gulf coast areas, which allows a long period of disease incidence. Low fertility sites receiving excessive irrigation or under high moisture weather periods are prime sites for disease development. Achieve balanced fertility and minimize thatch for long-term suppression.

Fairy Ring – These diseases are caused by the higher fungi (puffballs and mushrooms) and vary in their effects upon turf from grass stimulation to grass death. Many species of fungi are involved including highly poisonous types like *Chlorophyllum molybdites*. Use of flutolanil for fairy ring suppression has been variable in performance. The species of fungus involved and the depth of the fungus colony in the soil may be two reasons for fungicide performance variation. Fairy ring on bermudagrass can be confused with decline and/or *Rhizoctonia* leaf and sheath spot. A clinical



Fairy ring on bermudagrass (*Chlorophyllum molybdites*)

diagnosis can be very helpful here.

Gray leaf spot – This common spot on St. Augustinegrass is most damaging during the hot, rainy summer period. Sites poorly adapted to turfgrass often serve to over season the fungus. Shady urban lawn sites with persistent leaf spot problems should be redesigned and converted to shade-tolerant ground covers, bedding plants, or woody ornamentals. Affected lawns should be deeply watered in early morning hours. Avoid use of readily soluble N sources.

Helminthosporium blights – Primarily damaging in spring and fall on ryegrass and bermuda and is favored by thatchy sites with low fertility and frequent irrigation.

This disease can be mistaken for gray leaf spot on St. Augustine in late summer and early fall. Improve site fertility, reduce thatch, and irrigate for longer periods with less frequency.

Pythium root rot – Occurs on all grasses and is caused by a group of related fungal species spanning a

wide temperature range. Feeder root destruction occurs in sites with poor drainage or excessive irrigation causing turf yellowing and death with a characteristic bleached straw color. Improve soil drainage and restrict supplemental irrigation. Foliar fertilization may aid in recovery of slight to moderately damaged areas.

Rhizoctonia leaf and sheath spot – A summer disease of bermuda only, until recent isolations from St. Augustinegrass. The disease can appear as a small ring, arc or patch

making diagnosis difficult due to similarity of symptoms with fairy ring and decline diseases. Lab diagnosis is important in this situation.

Rust – Disease develops in the cooler periods, especially in partially shaded turf sites. Affected turf is thin and chlorotic with obvious yellow to orange-red blisters on leaf surfaces. Collect infected clippings during mowing. Fungicides are infrequently used.

Take all root rot (patch) – Stress-related disease on urban St. Augustine-, centipede-, bahia-, and zoysiagrasses. Develops in mid to late spring and continues through summer into early fall. Affected turf yellows, followed by a thinning to death. Feeder root systems are greatly reduced. Fungal pathogen invades following stresses from disease, insects, nematodes, cultural, or environmental factors.

The fungus cannot be reliably eradicated from the site, nor is pathogen-free sod available in the southeast U.S. **LM**

The author is an extension plant pathologist and professor at the University of Florida, Gainesville.



Abbreviated root system of St. Augustinegrass due to take all root rot.

Have a problem with Canada geese on your grounds and want to do something about it?

Copy this address: *Chief, Office of Migratory Bird Management, 4401 N. Fairfax Drive, Arlington, VA 22203.*

Then write a letter describing what you think about Canada geese—not the migratory geese, but the freeloaders. The ones that seem to think there is such a thing as a free lunch and it's served on your grounds each and every day. Describe some of the problems that these geese cause. Don't put this off.

Write this letter now. You only have until June 1 to let the Chief know.

Here's why it's important that you write.

The U.S. Fish and Wildlife Service is considering giving state wildlife agencies more authority to control "resident" (free-loading) Canada geese populations. They could control problem geese each year from March 11 to August 31 (May 1 to August 31 in Calif. Ore. and Wash.), and wouldn't have to get individual permits

from the Service each time as is currently required.

This is good news for grounds and turf managers in spite of certain conditions these state agencies would have to meet in reducing the number of these giant pest birds. For example, they could kill the freeloaders only after alternative non lethal means have proven ineffective or unfeasible. But the proposal certainly gives the state agencies more authority which is good.

The problem, of course, is the large, and growing, population of "resident" Canada geese. They don't migrate. Although they look like the geese that nest in the Arctic and sub-Arctic regions of Canada and Alaska, they are, in fact, a distinct subspecies, says the U.S. Wildlife Agency.

Remember, get your letter into the Chief before June 1. **LM**

Give U.S. Wildlife Agency a 'goose'



Ron Hall

RON HALL
Managing Editor

[LANDSCAPE/GROUNDS]

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Computerize? You shouldn't wait

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A mulch refresher course

[PEOPLE & PROJECTS]

Keller Outdoor Services on a roll

Orlando-based developer CNL, Inc. awarded Keller Outdoor Services, Sanford, FL, a contract worth more than \$300,000 for landscaping and irrigation services at Gran Park in South Park, located on John Young Parkway in south Orlando. In another project, CED of Maitland, Inc., gave Keller a \$200,000 contract to landscape and irrigate Waterview Club apartments in Orlando. Keller has added 30 new fulltime workers since the beginning of the year.

California pioneers join forces

Robert E. Sapien & Associates, Inc., Culver City, CA, joined forces with California Landscape Maintenance, Inc., Canoga Park, on March 28. The Sapien company will retain its identity, but will operate as a division of CLM with Robert E. Sapien holding the title of corporate vp. Chuck Johnson is CEO of CLM. He and Sapien have a combined total of 84 years in the business.

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Increase the odds of tree survival

The causes of tree loss are complex, yet two common and correctable problems can contribute to tree failure: poor planting stock selection and the failure to ensure that the planting stock is in good condition.

By TERRY A. TATTAR Ph.D., Shade Tree Laboratory, Univ. of Massachusetts



Transplant failure in red oak. Note how wrap was used to hide wounds on trunk.

Planting trees is win-win landscape service that benefits the property owner, the landscape professional and the public.

However, many trees fail within the first year of planting and the condition of many others are so poor that clients want them removed. Replacement costs are expensive for the nurserymen and landscape contractors and tree losses are major disappointments to homeowners and property managers.

Selection of tree species

During the many years I performed tree health diagnoses at the Shade Tree Laboratory I noted a pattern of frequently seeing many species as "patients" while rarely seeing or hearing about health problems on other species. The "high frequency" of complaint trees were usually exotics. The "low frequency" complaint trees were usually native trees. I have discussed this observation with many colleagues who have worked in plant health clinics around the United States and they admitted that they also made similar observations. Trees that grow locally and occur naturally in our fields and forests usually have few health problems. This can partly be attributed to the fact that the 'native trees' are occurring naturally within their natural range and on sites that are suitable for their existence. Any tree species, when planted in areas to which they are not acclimated or where the site conditions are not adequate will have increased stress which will often show up as increased occurrence and susceptibility to pests and diseases.

When you select a tree for a landscape location you need to ask what type of maintenance will be available for the tree after planting. If you aren't certain that the owner/manager is committed to providing a long term program of high maintenance, you should consider using native plant materials that will be suitable for the specific site conditions. Always assume that public shade trees will receive low maintenance at best and don't overlook other limiting factors such as tree tolerance to drought, salt,

compaction or pollution.

In the northeast, red maple, white pine, red cedar, black gum and sweet gum, are native trees that have few health problems. In the south, a similar list can include slash pine, sabal palms, live oak and laurel oak. These trees can be successfully grown with minimal maintenance. Many more native trees with few health problems can be added for these two regions of the country, and additional lists can be generated for any part of the country.

Selecting planting stock from the nursery

Tree planting should be defined as transplanting a tree from a nursery and successfully establishing it in the landscape. For landscapers and others who purchase trees in volume for development projects, facilities, golf courses, parks or streets, tree planting requires several key steps which *all* must be followed.

1) **Conduct nursery inspections.** Travel around the nursery to see what stock is available and determine how the nursery is managed. Be sure note any health problems. Then, locate trees you will consider for your clients. Conduct a thorough examination of the condition of each tree that you are considering for purchase. These steps also ensure that you consider those nurseries within a reasonable distance from your site, increasing the likelihood of selecting trees adapted to local conditions and reduced potential for stress from extended transportation. Your examination should include:

- ▶ Structure of trunk and branches - Select trees with trunks that have a single leader, and are free of cankers, major wounds and large branch cuts. Branches must be strongly attached to the trunk and must not arise from a single or very narrow location. Avoid trees with weak branch attachment or co-dominant stems that are weakly attached to each other. Included bark at the union of branch to trunk is a dead giveaway of weak attachment.
- ▶ Soil type - Try to match the soil type of the nursery with that of the planting location as much as

Proper drainage a key: here's how

Slow water drainage can be a problem in heavy soils and on compacted landscape soils. Where drainage is slow there is also reduced availability of oxygen to the roots. Tree species have varying tolerances to excess soil moisture and the resulting lack of aeration; consider the kinds of trees you see in wet/moist areas and how different tree species respond to flooding. Drowning plants will exhibit similar symptoms as trees suffering from drought: browning and drying from the leaf edges inward and defoliation.

If you are concerned about poor drainage you can check the extent of the problem with the commitment of some time and a few simple steps:

- ▶ dig a hole approximately 10 inches deep and 10 inches in diameter;
- ▶ fill the hole with water and allow it to drain;
- ▶ fill the hole with water a second time and measure the rate at which the waters drains from the hole;
- ▶ water should drain from the saturated hole at a rate of about one inch per hour.¹

Another method would be to:

- ▶ dig a shallow hole one to two inches deep;
- ▶ press a cylinder six inches deep and six inches in diameter into the soil to a depth of one to one and one-half inches;
- ▶ keep water in the cylinder for eight to ten hours;
- ▶ after the last filling, if the water does not lower at least one inch within two hours, you may have a percolation problem.²

If you have slow draining soils there are options of varying degrees of effort:

- ▶ in the early stages of landscaping, loosen

and rip the soil to break it up before final grading;

- ▶ final grading or changing the grade so as to ensure that drainage is directed away from the planting hole;
- ▶ while the benefits of soil amendments are disputed, if the decision is made to amend the soil, do not use sand as a sole amending material and if using organic materials, ensure that only composted materials are used.
- ▶ plant the tree slightly raised (to a maximum of 1/3 of the root ball) above the grade in a wide, shallow hole and be sure to mulch the area (2-3 inches is sufficient and not touching the tree trunk).
- ▶ consider planting the tree in a different location;

There are some approaches that should be avoided:

- ▶ do not add a coarser soil or simply add more fill on top of the soils as this will affect the drainage of the site, particularly without prior preparation and appropriate grading, and may have unintentional results due to the deeper soils being wetter than the upper soil layer;
- ▶ even more seriously, do not add gravel or other coarse materials to the bottom of the planting hole, as this can result in a perched water table by slowing the natural (albeit limited) drainage of the finer or compacted soils; as water will not move into the coarser soils until the finer soils are completely saturated.

—Nancy Stairs

¹ JAMES URBAN AND DR PHIL CRAUL, *SUCCESS WITH SOILS IN URBAN LANDSCAPES*, ARBOR AGE, JULY 1996

² RICHARD W. HARRIS, *ARBORICULTURE*, 2ND ED.

possible. Trees growing in sandy nursery soil do not establish well in soils with high clay content. Moisture stress problems can often occur when nursery and planting site soil are severely mismatched.

► Place identification tags on all trees that you intend to purchase.

2) Discuss specific transplanting procedures that are needed with the nursery

be examined at the time of delivery from the nursery *before* they are accepted for planting for your client. Match nursery tags and examine trunks, branches and root balls for damage during digging, shipping or handling. Remove any wrapping to examine the condition of the trunk. Reject any trees with large broken branches, trunk wounds or cankers, dead roots or distorted root balls from broken roots.

4) Proper siting. Stake all tree locations with the owner before you plant any of the trees. Nothing can be more frustrating to the landscape professional and threatening to a tree than to have it

moved a second time at the owner's request. Trees must have adequate drainage to survive. It has been my experience that inadequate drainage is a significant cause of mortality of transplanted trees in suburban and urban landscapes.

5) Follow-up care. Cords that tie trunk wrap and the root ball are often left in place only to girdle an otherwise correctly planted tree. Bindings need to be removed at the time of planting as does any treated or artificial burlap. Trunk supports and water wells become long-term liabilities

and should be removed after one growing season. Landscape managers and nurserymen sometimes assume the other is performing these follow-up care needs of the tree, when actually neither do! Watering is the single most needed action for a tree during the first two years after trans-



Try to match the soil type of the nursery with that of the planting location as much as possible. East-ern white pines, Massachusetts.

planting. It would be incomplete to discuss tree selection to minimize health problems without addressing the unique problem of transplanting large trees. Property owners and landscape architects often seek to create an instant landscape, and will suggest the purchase of trees greater than eight inches in caliper, and sometimes trees 16 inches or more in caliper when available at a nursery. The establishment times of these large trees is very long and the successful establishment rate can be low without appropriate care. I have often seen large trees struggle for three or more years to regain their condition at the nursery, while owners are demanding replacement and landscapers are pleading for more time. In my experience, the selection of smaller four- to five-inch caliper trees is a much better choice for everyone. Ironically, a tree of that smaller caliper will often overtake a transplanted tree of larger caliper in a few years. Instant gratification has its price in the landscape! □

The author is a professor in the Shade Tree Laboratory, Dept. of Microbiology at Univ. of Massachusetts, Amherst.

Keep trees 'above water'

While excessive water can be problematic for newly transplanted trees, a far more common problem is insufficient water. This is an even greater problem for trees which are planted as balled and burlapped or as barerooted stock, as the loss and removal of the fine absorbing roots greatly reduces the ability of the tree to take in water.

A guideline for watering newly planted trees is that they need one inch of moisture per week (precipitation and irrigation combined). This is in addition to water for the surrounding turf and should be applied as a deep watering, as opposed to frequent sprinkling. Sandy soils may require watering at more frequent intervals.

Water should be applied at a rate that will allow the water to percolate into the soil. A soil berm located at the edge of the root ball will help avoid runoff; however, in climates where winter thawing and freezing is common, these berms should be removed in the fall. The use of trickle or drip irrigation, or products such as TreeGators, will also allow water absorption into the soil. If using a sprinkler system, place a couple of cans within the sprinkler area to determine the time needed to apply water at a rate that can be absorbed by soil.

Previous wisdom recommended that a newly-transplanted tree should be pruned to reduce transpiration. This theory has been proven incorrect, as adequate leaf area is necessary to promote root growth. Only remove any dead or broken branches and avoid pruning for another year or two.

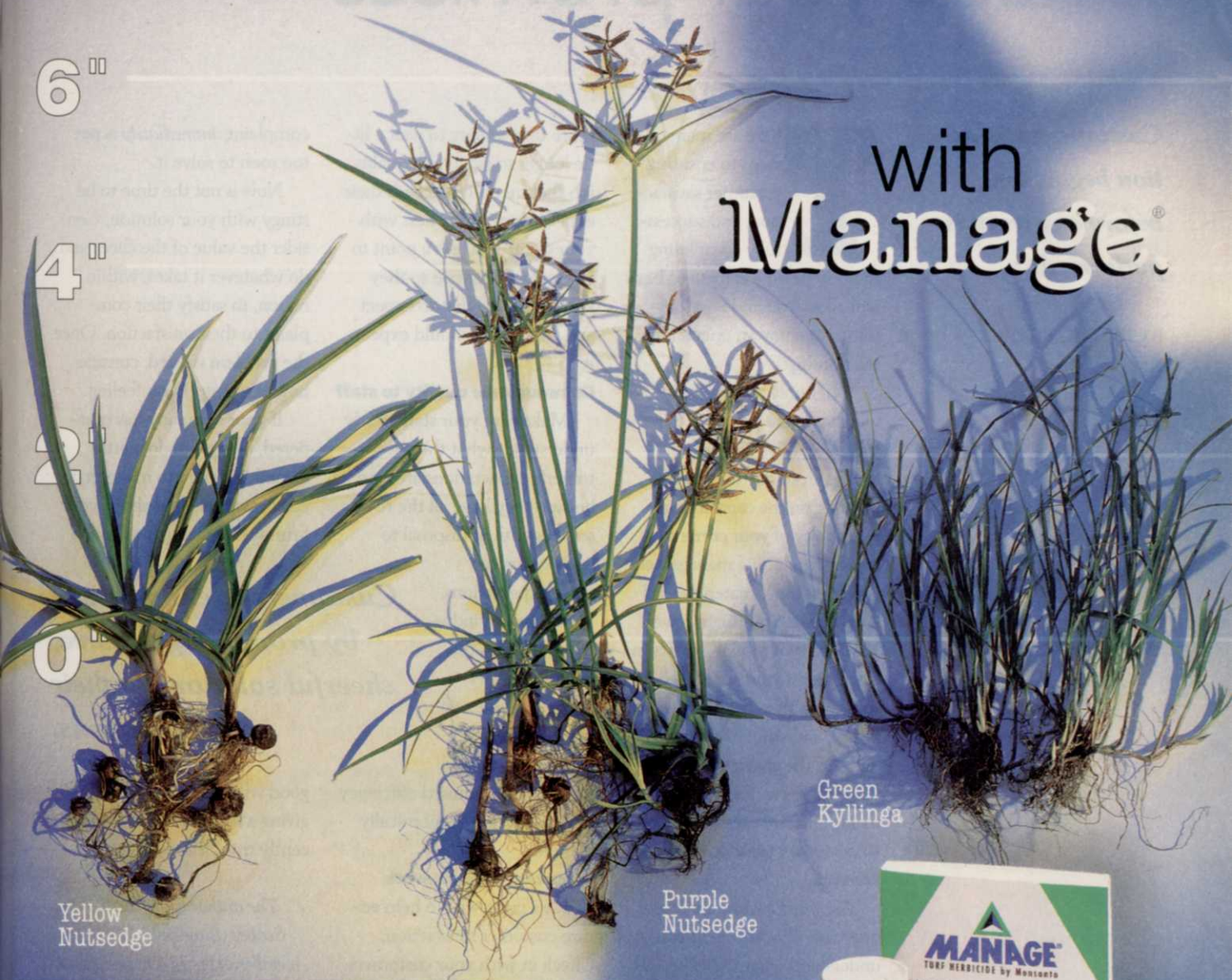
Mulch will reduce immediate competition with turf or slow moisture evaporation from exposed soil. Mulch is appropriate and beneficial for virtually all planting situations.

—Nancy Stairs

owner/manager. Specify your preferred methods of digging and desired ball size. Discuss specific shipping arrangements, including dig date, ship date and arrival date on clients property. Reach agreement on replacement guarantees before the sale.

3) Inspection at delivery. All trees must

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MANAGE

Know your customers, keep your promises

Customer satisfaction begins long before any work is performed.

By RICK KIER,
Pro Scapes, Inc.

There are many steps to ensuring customer satisfaction, and successfully completing these steps on a consistent basis will allow you and your customer to enjoy an outstanding relationship.

Offer only those services which you are prepared to perform properly. This may change from day to day, depending on the capacity and availability of your current resources, including management and crew time, materials, and equipment. You might have the best lawn mowing crews in town, but if your scheduled routes are already filled to capacity, and you sell a big job without the ability to expand your resources, you are guaranteeing customer dissatisfaction.

Know what your customers want

Ask your customers those questions that will help you understand what they like and don't like about similar products and services. Repeat back to them what you understand to be their desires. Listen for them to affirm or correct your perception.

Follow through on promises

Don't make promises you can't deliver. Even though most people want it done "yesterday," they are normally

more than willing to wait a little longer to get a high quality job that meets or exceeds their expectations. Be honest with your client. Make it a point to be clear and concise so they know exactly what to expect and when they should expect it.

Communicate quality to staff

Make sure your staff clearly understands what the customer's expectations are, and be sure they have all the resources at their disposal to meet or exceed these expectations.

In most green industry companies this includes proper training so the staff has the necessary skills to do a superb job with the required efficiency to keep the job economically feasible.

Follow up on your work

It's a great way to help ensure customer satisfaction. Check in with your customers after a big job is completed. Touch base with your long term maintenance clients from time to time. People love to hear from you, and just asking how things are going and if they are happy with your work, encourages them to think highly of you and your organization. If they do mention a problem, or call you up with a

complaint, *immediately* is not too soon to solve it.

Now is not the time to be stingy with your solution. Consider the value of the client and do whatever it takes, within reason, to satisfy their complaint to their satisfaction. Once the problem is fixed, consider how the customer is feeling.

If your company has blundered, be sure to do a little something extra to make that customer feel good about your firm. It is amazing how much

Customers are impressed by prompt, aggressive, cheerful solutions to their problems.

good will you can achieve by giving a free rose bush to a recently troubled customer.

The author is president of Pro Scapes, Jamesville, NY, and a member of the LM reader panel.

1998

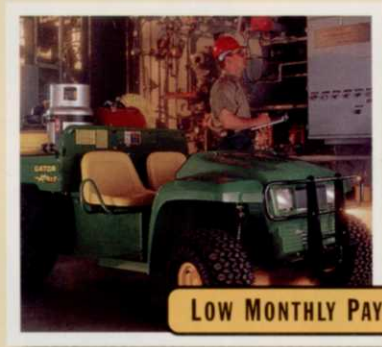
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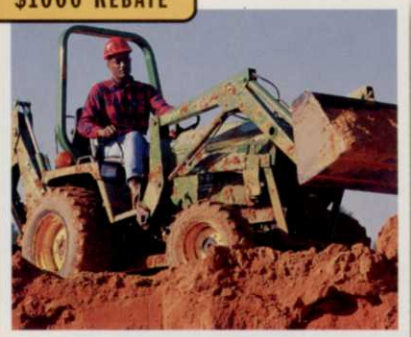


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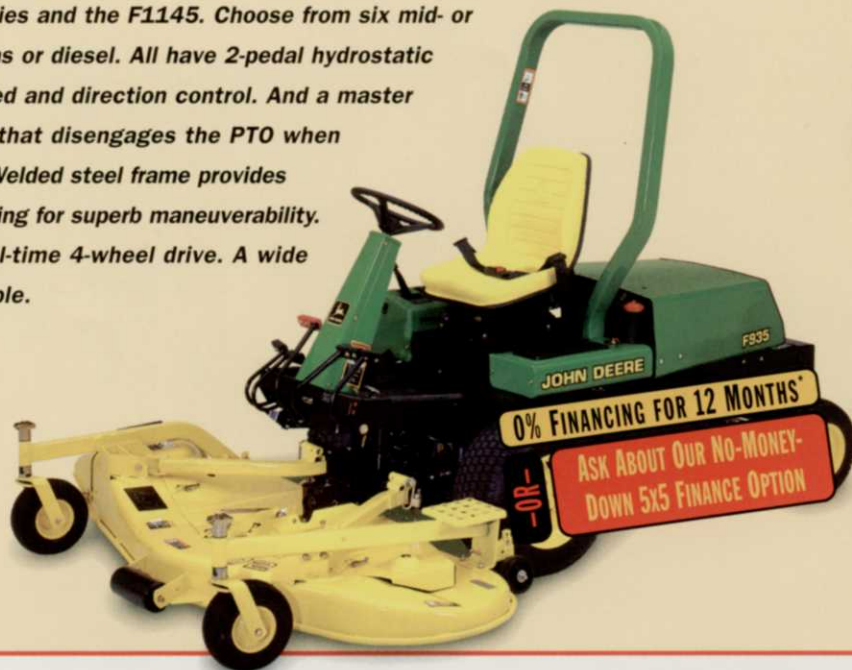
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* All financing offers are for commercial use only at participating dealers and expire May 31, 1998. Subject to approved credit through John Deere Credit. Equipment financing is at 7.9 percent unless indicated otherwise. A 20 percent minimum down payment is required for all equipment, except commercial walk-behinds. (The Commercial Cutter Package requires no down payment.) Dealer set up, freight, taxes, and other miscellaneous charges (if any) are not included in prices and monthly payments. 90-Days-Same-as-Cash is through John Deere Credit Revolving Plan Commercial-Use Account. Personal-use installment financing also available. Ask dealer for details.

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\$199/MONTH**
FOR 36 MONTHS

4100 TRACTOR

New styling, new features, special introductory price. Standard features include 20-hp diesel engine. Sliding gear/collar shift transmission with 8 forward/4 reverse speeds. Four-wheel drive. Mid and rear PTOs. And power steering. Come in soon for a test-drive.



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4100/4-WHEEL DRIVE/GEAR/BAR TIRES
AMOUNT FINANCED IS \$7,365.30 AT 7.9% FOR 60 MONTHS



770 PRICE FIGHTER

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That noise you hear...

...is the sound of people who complain about inconsiderate leaf blower operators. Keep the neighbors happy and avoid bad publicity through thoughtful backpack blower use.

By AMY STEPHENS

There are many ways blower operators can be more sensitive to concerns people have about this type of equipment, and still get their work done in a timely manner.

By now we've all heard the stories of communities objecting to blower noise on the streets, of neighborhood residents campaigning against blower use around their homes, of officials in cities like Los Angeles seeking blower bans of one type or another. Blowers, plain and simple, are taking it in the neck right now.

Like a lot of situations where public "bandwagons" develop and the media gets into the fray, there's misinformation being spread. Fact is, there are things about

blowers that are good — their speed, mobility and efficiency at sweeping flower beds, sidewalks, driveways and other areas — and things that can cause trouble — their whining noise, the dust they blow up, and the times of day crews use them.

Don't tamper with equipment

There's just no substitute for quality. It'll cost more, and you'll have to take better care of it, but it'll run better, last longer, and give you more precise service and performance over time than any bargain you buy. A lot of better equipment is quieter and has been tested and is labeled as meeting EPA emission regulations.

- ▶ Proper tuning and maintenance are a must.
- ▶ Make sure you operate your power



Update on blower restrictions

Gasoline powered leaf blowers would be regulated by the state of California if SB1651 becomes law.

All blowers sold and those in use for commercial purposes after Jan. 1 2000 could not exceed set maximum noise levels.

The bill would establish a trade-in program for blowers that do not meet state standards.

Violators would be fined \$100 to \$500 for each infraction.

The legislation would also prohibit city and county governments from regulating the use of gasoline-powered leaf blowers except between the hours of 6 pm and 8 am on weekdays and between the hours of 5 pm and 9 am on weekends.

Testing and certification program would be established under the law, and would establish a trade-in program for gas blowers that do not meet certain specified standards, which would apply to all gas-powered leaf blowers sold in the state and to gas-powered leaf blowers used for commercial purposes.

Robin Pendergrast of the International Marketing Exchange, which represents blower manufacturer Echo, says he has seen "a collective effort by a lot of different players [in the leaf blower controversy]; from dealers, to consumers, to municipalities, contractors, the California Landscape Contractors Association, and some manufacturers." These people, says Pendergrast, want to act together to keep these restrictions—and certainly, any bans—to a minimum.

"It's not as cohesive as I would like, but there is a sustained effort," says Pendergrast. □

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**GRUBS!
LOSE YOUR
TURN.**

CALLBACK

**STORMS.
GO BACK
2 YARDS.**

**EMPLOYEE
CALLS IN SICK.
LOSE A TURN.**

**YOU START
A WAITING LIST
DRAW A CARD.**

**CUSTOMER
REFERRAL.
DRAW A
YARD CARD.**

CALLBACK

**MOVERS RUIN
A TREATMENT.
GO BACK 1 YARD.**

CALLBACK

YARD

**GRUBS!
LOSE YOUR
TURN.**

YARD CARD

YARD CARD






You didn't use Merit.[®]
CALLBACK
Go back 3 yards.

**THE BEST WAY TO
MOVE YOUR BUSINESS
FORWARD IS TO MAKE
SURE YOU DON'T
GO BACK.**

The rules are simple. Keep your customers happy and you keep moving forward. Otherwise, you go directly to a callback. And the more you go back, the harder it is to get ahead. But one application of MERIT[®] Insecticide is all it takes to control grubs and callbacks. And fewer callbacks mean more time, money and labor you can use to move your business forward. Which puts you ahead of the game. For more information, contact Bayer Corporation, Garden & Professional Care, Box 4913, Kansas City, MO 64120. (800) 842-8020. <http://usagri.bayer.com>

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Circle No. 122 on Reader Inquiry Card

tools within the specs provided by the manufacturer (they're in your owner's manual if you need to check). There are engineering reasons for those specs, and if you change the exhaust, throttle configuration, fuel, or whatever, you defeat them.

► Use high octane fuel and a best quality 50:1 mix oil. Keep your two-stroke tools tuned properly,

too. If they are tuned and still smoke — a big red flag for some critics — consider switching to a low-smoke or smokeless oil.

► You can also get a biodegradable chain oil for chain saws. Don't use motor oil or transmission fluid. Keep all cutting blades sharp. That way, you'll use less power and less time to get the same amount of work done.

► Pay attention to the noise you're making. Buy low-noise tools to begin with, then use only as much power as you need. Don't race the engine if you don't have to. Lawns and flower beds can be swept at lower rpms (and hence with less noise). If your unit has a centrifugal clutch, though, watch to make sure it's engaging fully at lower rpms, and adjust as necessary.

► Keep the muffler on your machine and replace it when it wears out. This caution is not just for the neighbors, it also will protect your ears, which can be affected by continuous noise.

► Limit the number of blowers you run at one time. Stagger the sweeping instead, so only a few machines are on.

► Consider the people around you. Get to know your customers' schedules. Take the time to go around the neighborhood and ask people the best times (as far as they're concerned) to do yard work. Find out if there are local restrictions in effect on tool operation.

Note this information, customer names, etc. in a book that you and your crews can consult. Update it by phone every so often. This preparation delivers many benefits. It lets the local people know who you are, that you're trying to be sensitive, that you're accountable. It gives you more positive knowledge of the area and its concerns. And it opens the door to forming positive relationships. □

—The author is a freelance writer based in Portland, Ore.

Bad attitude will blow you away

It's human nature for people to be reasonable, and you should be able to work out compromises for most situations. Some examples:

Work on apartment building landscapes in the early morning is usually a bad idea. Instead, **schedule the work** to minimize the impact on residents. Do quiet work first, and watch for cars leaving (for work).

Make sure debris you blow doesn't end up littering somebody else's property.

When **disposing of oil** and gasoline, do it properly. Don't just dump it.

You can make points with customers and communities by thinking about safety, too. **Check your work area** for material that'll become a hazard if airborne, like rocks, metal objects. **Make warning signs** (maybe on A-frames) indicating that pets, kids, etc. should be kept at least 50 feet away from machines while they're running, and place them where you're working. You could provide this same information on a printed sheet you include with your new-customer kits.

Take **wind conditions** into account. If there are a lot of open windows and doors, sweep somewhere else first. Let the engine idle a few minutes to warm up. **Use lower speeds** to blow leaves from grass or beds. Jack it up as necessary for walks and patios. Go as fast as you can.

Pay attention to gas spills. It may surprise you, but more than 20 percent of the emissions coming from two-cycle tools are the result of fuel spills. So if you're careful and don't spill any — there are tools like spillproof canisters, the Shurpou gas nozzle (developed by an Idahoan), and simple funnels that'll eliminate the problem — then you've reduced pollution significantly already, without ever starting the job.

Besides using lower speeds, you can cut the dust you raise sweeping by first sprinkling or **hosing down areas** to be swept. Try alternative tools. There are some communities that have already adopted blower restrictions, so it doesn't matter how careful you are, you can't use the tools. In these cases, think of alternatives that'll work for you, which can mean anything from using hand tools to changing your service contract with your customer.

Where large area cleanup on turf or pavement is necessary, there is a power tool that will work. It's called a PowerBroom, it's manufactured by Shindaiwa, and it's intended for most sweeping and raking tasks. The tool looks like a straight shaft trimmer except for the lower end which is a spinning drum with rubber-like DuPont Alcryn fins. It works for snow removal, for sweeping gravel out of grass, cleaning up sawdust, raking leaves and sticks, spreading mulch and bark chips, backfilling irrigation trenches, sweeping or removing water from paved areas, cleaning up dropped fruit and seed pods...all without harming the turf. □

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*Juris Tontegode
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"It's extremely rare to get a callback on Rain Bird systems. That's why they're the only products I install."



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RAIN BIRD

Ornamental grasses: popular, easy to manage

Ornamental grasses are gaining popularity due to their low nitrogen/pesticide needs and drought tolerance. They also work well in all kinds of settings.

BY JOHN C. FECH, University of Nebraska

Ornamental grasses are being incorporated into landscapes because they tolerate or even benefit from lower application rates of nitrogen and pesticides. They also show good drought tolerance, are resistant to most diseases and insect pests.

Ornamental grasses vary in size, shape, color and texture in both foliage and inflorescence (seed head formation). Grass forms vary from low mounding to fountain

shaped to upright.

Many of the grasses change from a green summer color to various autumn displays of straw yellow, orange, red or purple. The inflorescence can vary in size and color as well, and add considerable visual appeal to a landscape.

Planting and installation

As with most plant materials, success depends greatly on soil preparation before planting. Ideally, the planting area should be prepared in the fall, beginning with a thorough rototilling to allow for adequate moisture penetration. Fall tillage facilitates freezing and thawing action during the winter, and improves soil tilth and workability. Fall is also the best time to test the soil, to determine nutrient needs, pH adjustments and organic matter needs.

Based on the soil test, modify the soil to bring the pH to a range of 5.5 to 7.5 and the organic matter content to three- to five-percent. Add sulfur or limestone to adjust the soil pH. Incorporate them to a depth of 12 inches in the fall, to allow necessary chemical reactions to occur before planting in the spring.

A compost made of equal amounts of greens (grass clippings, green trees and shrubs), and browns (sawdust, brown trees and shrubs, leaves, fallen pine needles, etc.) will moderate sandy, excessively drained soils and poorly drained clay content soils. Regardless of soil type, ornamental grasses will grow vigorously after thorough incorporation of quality compost. As with sulfur and limestone, the soil test will indicate the amount of compost to incorporate. If compost is not readily available, shredded leaves, rice hulls, cottonseed hulls, reed sedge peat moss, Canadian peat moss and earthworm



Foliage colors include shades of green, yellow, blue, red, brown and variegated



◀ Ornamental grasses are used in a residential setting.

castings are reasonable alternatives.

Plant in spring or fall

Ornamental grasses can be planted in spring or fall. An advantage of spring planting is to give adequate time for a root system to develop before winter. The downside is the potential for annual grass and annual broadleaf competition, however this can be reduced through mulching with shredded bark or wood chips. Plants should be planted no deeper than their previous growing depth. Plants positioned too deeply tend to develop root diseases or simply rot in the ground. Grasses should be well-watered at the time of planting.

Maintenance of ornamental grasses

Ornamental grasses require minimal care. Most species are insect and disease resistant. However, improperly sited plants may become infected due to poor air movement, high nitrogen soils or inadequate light. As ornamental grasses become more common, pest problems may develop. At that point, cultivar selection based on pest resistance will become important.

Fertilization: Ornamental grasses require relatively low levels of fertility for best performance. Landscape managers and golf course superintendents should keep N levels low to prevent lodging or flopping and the need for staking. Leaf color and vigor are a guide to nitrogen requirements. If the leaf blade isn't a normal green color, you may need to apply nitrogen.

Irrigation: Newly-planted grasses need a moist root zone until a mature root system develops. An extensive root system can ex-

tract sufficient water to maintain the plant during periods of drought. Once the grasses mature, the frequency and quantity of water needed will vary with grass species and site characteristics (soil, heat, wind, etc.). The amount of water applied will also depend on quality, size, and growth rate desired. Consider drip irrigation on specimen plants to reduce the likelihood of foliar disease. Be careful not to overwater drought tolerant grasses.

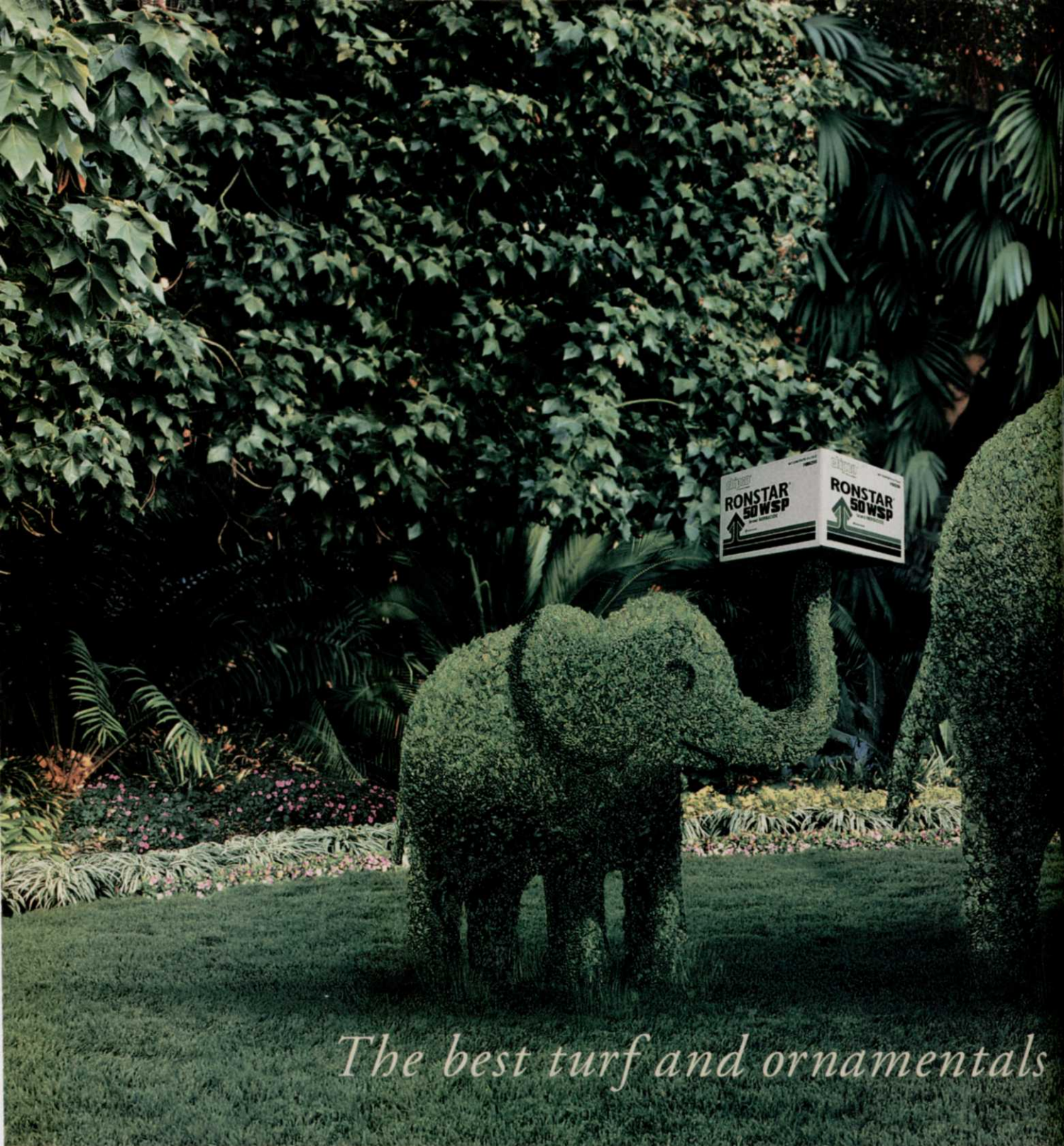
Weed control: Broadleaf weeds are more easily controlled near ornamental grasses than undesirable grass (bromegrass, orchardgrass) or grass-like weeds. Select an appropriate herbicide to eliminate dandelions, plantain and other broadleaf weeds. Thoroughly read the label of a product such as Trimec to determine applicability. In an established ornamental bed, products such as Betasan, Ronstar and Surflan can be used to discourage annual grasses and broadleaves.

Because selective herbicides are not available for grassy weeds among ornamental grass plantings, weedy grasses must be eliminated before the site is planted. After establishment, mulch can suppress weed growth and reduce the need for chemical controls and/or hand weeding.

Seasonal preparation: Adapted orna-



Ornamental grasses are here used in a commercial setting.



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
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all season long no matter how much ground you have to cover. And the new water soluble packaging means that you can now tank mix CHIPCO® RONSTAR® with Roundup® for use as a directed spray on landscape beds and other non-turf areas. Of course, you'll still get all of the other CHIPCO® RONSTAR® advantages, like no root pruning, no leaching, and season-long protection from just one spring application. This year, keep your customers satisfied with CHIPCO® RONSTAR® herbicide in two easy-to-handle sizes.

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◀ Mix the grasses with other perennials for variety.

require mulching, especially in continental climatic areas.

In early spring, prior to new growth, remove the foliage from the past year. Foliage can be removed with hand clippers or with a weed whipper or other power tool, depending on the toughness of the foliage and the number of ornamental grasses. When foliage is removed spring growth will begin earlier. Foliage left on the plant will delay the crown's warming and subsequent growth by as much as three weeks.

Plant division depends on

the spacing and visual appearance desired by the landscape manager, and the need for additional plants. If the center of the clump shows little or no regrowth, the plant should be divided. Separate and replant the vigorous growth on the outer edge of the clump. A typical ornamental grass plant can be divided into three or four sections, which can be replanted in the original space and in other landscape settings. □

mental grasses don't require winter mulch. Check with local or state extension offices to determine adaptability and zone hardiness for localized planting areas.

Foliage left on the plant until early spring will insulate the plant from damaging temperature extremes. Extensive mulch covering methods can be used to protect specimens adapted to regions one or two zones of hardiness milder than yours. In addition, fall planted grasses may

Groundcovers, accents & texture

Ornamental grasses can have tremendous impact on how a landscape is viewed by passers by or used by recreational participants. Faced with hundreds of new choices, landscape designers are just now beginning to realize the potential of ornamental grasses.

There are no specific rules for how to use grasses in the landscape. Tall grasses can provide screening or shade. Short or miniature grasses make excellent groundcovers. Flowering grasses can be used as accents, either alone or in groupings, however the most impressive statement is made by massing them together.

Ornamental grasses have great potential for use when winter features are needed to add color and texture to an otherwise drab winter outdoor scene.

The most important consideration is the specific needs and characteristics of each plant: sun/shade, drainage, height, foliage color, habit.

When grasses get aggressive

Most ornamental grasses form clumps but there are some species which have invasive rhizomes. These grasses can be useful where ground covers or erosion control is desired, however, controlling these grasses can be difficult and cement barriers, pavement or other structural features are necessary to confine the spread. Aggressive species include:

blue lymegrass	<i>Leymus arenarius</i> (also <i>Elymus arenarius</i>)
cordgrass	<i>Spartina pectinata</i>
Chinese silvergrass	<i>Miscanthus sacchariflorus</i>
Feeseys form ribbongrass	<i>Phalaris arundinacea</i> 'Feeseys Form'
giant blue rye	<i>Leymus racemosus</i> (also <i>Elymus giganteus</i>)
ribbongrass	<i>Phalaris arundinacea</i> 'Picta'
yellow ribbongrass	<i>Phalaris arundinacea</i> var. <i>luteo-picta</i>
variegated cordgrass	<i>Spartina pectinata</i> 'Aureo-Marginata'

SOURCE: M.H. MEYER, D.B. WHITE AND H. PELLETT, *ORNAMENTAL GRASSES FOR COLD CLIMATES*, UNIVERSITY OF MINNESOTA, 1995, EXT. PUB. 573

Equipment exchanges for tax deferral

Like-kind exchanges are a cash flow management tool for almost any company that replaces depreciated equipment.

by BRUCE J. GOLDSTEIN

Like-kind tax-deferred exchanges, once considered of value only in the real estate industry, are now widely recognized as a cash flow management tool for almost any company that replaces depreciated equipment.

Potential benefits include a 40 percent cash flow benefit and a 4.5 percent present value cash savings.

Current year income

Equipment, though depreciated, also retains significant market value, and the sale results in current year taxable income (the recaptured depreciation credit) even if you sell it at a loss.

A "like-kind exchange," can defer those taxes for years and use the cash towards the purchase price of your replacement equipment.

The "like-kind tax-deferred exchange" provision of the Internal Revenue Code has been around since the 1920s. However it was only in the aftermath of a number of court cases in the 1980s that the IRS yielded and published regulations that made "like-kind exchanges" workable as a tax management tool for equipment owners.

Not a 'swap'

Contrary to common belief, like-kind exchanges do not require a property "swap." A like-kind exchange is a sale of used equipment followed by a purchase of replacement property, dressed up to meet a number of IRS requirements.

You do not have to buy your new equipment from the buyer of your old equipment, and the two can occur up to 180 days apart.

Tax-deferred, not tax-free

Your tax basis in your replacement equipment will be reduced dollar-for-dollar by the gain that was not recognized as income in the exchange. In other words, your basis in the replacement equipment will be limited to the new cash you contribute, which means that over the tax life of the replacement equipment, you will have smaller depreciation credits.

The net result: you pay the same taxes, but over the multi-year tax life of the new equipment rather than up front. This yields both a cash flow benefit and a present value

savings due to the time value of money.

If you are exchanging fully depreciated equipment, the present value savings at an eight percent discount rate are approximately 4.5 percent of the sale price of your old equipment.

The "like-kind exchange" is generally considered a low-risk tax strategy. Talk with your tax advisor to determine if it's for you. The greatest risk is the security of your funds. The funds should be escrowed with a reliable institution and available for disbursement only with your signature. □

The author is founder/president of CapXExchange, LLC, King of Prussia, Pa., a provider of qualified intermediary services for like-kind exchanges.

How exchanges work

1) Before or after you agree to sell your old equipment, you enter into an agreement with a "qualified intermediary," an unrelated, third-party who facilitates the exchange. Under IRS regs, the intermediary can't be an associate, your attorney or your accountant. In those cases where you need to acquire the new equipment before you sell the old equipment, the same benefits can be achieved through a similar but more complicated mechanism known as a "reverse exchange."

2) You assign your rights under your sale agreement to the qualified intermediary. At your direction, the intermediary sells your old equipment to the buyer, who pays the proceeds into an escrow account established for the exchange.

3) Within 45 days following the sale of your old equipment, you must "identify" your like-kind replacement equipment.

The definition of "like-kind" can be

broad, depending on the type of equipment being sold. "Asset classes" identified by the tax code include trailers, light trucks, heavy trucks, vessels, aircraft and computers.

4) After you enter the agreement for your "like-kind" replacement, you assign the contract to the qualified intermediary. At your direction, the qualified intermediary buys the replacement equipment on your behalf using the escrow funds together with any cash you contribute to meet the price of the replacement.

5) The title to the equipment and all contractual obligations such as the seller's warranties pass directly from the seller to you. The qualified intermediary only facilitates the transaction. Buying through a "like-kind exchange" will not interfere with the security of your interest in the equipment or your ability to make warranty claims.

Computerize? The answer is obvious

LANDSCAPE MANAGEMENT begins series focusing on software for lawn/landscape/grounds companies next month.

By RON HALL/ Managing Editor

David Tucker admittedly has an agenda when he extols the virtues of computerization in the green industry. He is, after all, president of Sensible Software, Inc., makers of CLIP software program for service industry professionals.

But his presentation at the 1997 PLCAA Confer-

ence contained solid information about computerization and particularly about the value of industry-specific software for the green industry (and, not just CLIP). We felt that you, our readers, would appreciate some of Tucker's observations too.

Lawn/landscape professionals increasingly see and rely on the computer as

an indispensable business management tool. They've discovered that it can do repetitive tasks, pen-and-pencil tasks, accurately and efficiently. And reduce paperwork substantially.

More efficiency, reduced costs

Added efficiency reduces costs that don't directly produce revenues, says Tucker. What are these

costs? They're everything that doesn't *actually* serve your customers and keep them happy. It's the behind-the-scenes activity that runs your business and keeps it going.

"You want to get that as automated and silent as you can to free you up to do what you do best which is to serve your customers," Tucker says. "If you can't do that, you're going to be busy running your company. It's going to take most of your creative energy and time to do that."

With the proper software, a computer can help a lawn/landscape pro:

- ▶ track financial information, including accounting, estimating, job costing, bidding.
- ▶ manage employees and employees' time as well as managing customers, equipment and inventory.
- ▶ market their products and services, by allowing them to professional-quality newsletters and correspondence to customers and potential customers.
- ▶ creatively, perhaps as a design or drafting tool.

Business owners, first and foremost, use their computers for managing money.

"Computers help you keep money in your pocket," says Tucker. "Next to billing, job costing is probably the most important function you do for your company. Billing gets the money in the door. Job costing tells you whether you're making or losing money on each"

Powerful 'power' tool

But none of this is possible without business management software. Without the proper software, or if you don't know how to use it, a computer becomes just a fancy typewriter.

It is, in a very real sense, a power tool. Misuse it, and it's of little value. Use it intelligently, and it's incredibly helpful. It can cut your work significantly. That's why, like any other power tool, you want the most efficient, the fastest, the most powerful tool you can afford to take to a job site. Otherwise, why would a mowing contractor spend over \$10,000 for a professional mower when that contractor could go to the neighborhood hardware store and buy a consumer-quality mower for about \$100? The contrac-



tor buys the expensive mower because, in the long run, it gets the job done, and represents value.

Look at your computer and the programs that run it in this light. You want an up-to-date computer and operating system, and software that addresses your particular business needs. This is even more critical for you because of the seasonal nature of your operations. Most of you only have about 170 work days to make a full year's living—for you, your families, and your employees. You must be efficient.

Appropriate software

One way to increase your efficiency is by using software designed specifically for the lawn/landscape industry. While neighborhood computer retailers can supply a universe of "horizontal" (general) business

REASONS (TONGUE IN CHEEK) NOT TO COMPUTERIZE:

from David Tucker at PLCAA conference:

- 1) *I plan to be out of business in the next two years.*
- 2) *I plan to work for someone else soon.*
- 3) *I only work for one customer. He's my uncle.*
- 4) *My company is really a front for money laundering.*

management software, lawn/landscape pros also have a growing choice of software products targeted directly at them. This "vertical" or industry-specific software typically costs more than off-the-shelf soft-

ware, but it provides users with certain specialized capabilities.

This is what we at LANDSCAPE MANAGEMENT are going to be reporting on in a series of articles starting in June—the variety and availability of software products designed for and marketed to lawn/landscape/grounds professionals.

Now that the cost of personal computers and supporting hardware is affordable to even the smallest operation, the question of whether to computerize (or to upgrade your system) or not has already been answered. You can't afford not to. □



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Mulch refresher course

Mulch applied too high around trees can cause multiple tree problems.

By NANCY STAIRS/ Technical Editor

The benefits and the methods of using mulch have been proclaimed for some time but we are still seeing the extensive misuse or lack of mulch use in the landscape. It is all too common to see landscape trees showing wounds from repeated injury from mowers, a definite stress factor which can make the tree more susceptible to pest and disease organisms.

You can overuse mulch too, in particular, piling of mulch around the trunk of a tree. This practice is far too common and provides no benefit to the trees. With 'volcano mulching' the concerns can be boiled down to the fact that mulch in close contact with the tree trunk holds moisture against the bark. This is an ideal environment for pests and fungi to exist and attack the tree. This is not so different than leaving tree wrap or burlap on the trunk of a young tree. Often, upon removal of these materials you can find various insects, pupae and cankers. Mulch placed directly against a tree trunk can also promote the growth of adventitious roots for some species. This may cause additional stress to the tree if the mulch dries out or is removed.

In some cases, upon closer inspection of one of these trees with 'volcano mulch', you can find that the issue is not the amount of mulch used but instead reflects a tree that has been planted with the root ball almost completely out of the ground. While planting a tree with a raised root ball is suggested for sites with poor drainage, there is nothing in the literature that supports a tree being planted with more than 1/3 of the root ball above ground level.

At planting, the mulch should be placed over the root ball area and extend a little further. Since the tree roots will continue to extend further and further from the tree itself, the mulch can also be extended to provide the small absorbing roots with suitable growing conditions. Naturally, there are limits to how far a mulch ring can reasonably be expanded but for the first few years after planting this should be a consideration.

Mulch is not a one-time deal. As the mulch degrades into the soil, additional mulch can be added to the recommended depths. In some cases, complete removal and replacement of mulch may be appropriate. For trees located in areas where winter conditions require salting of walks and roads the mulch can end up holding a build up of salt. With spring rains the trees are repeatedly treated to doses of salt directly into the root zone. The removal and replacement of mulch early in the spring can help reduce some of that impact. **LM**

Mulch should be between 2 to 4 inches deep and should not come into contact with the tree trunk.



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ALCA seminar set for Aug. 21-22

The final 1998 Masters in Management workshop by the Associated Landscape Contractors of America (ALCA) is set for August 21-22 at the Hotel Sofitel in Chicago. Workshop leader Kevin Kehoe teaches landscape contractors how to increase profits and develop a strong management team.

Content of the two-day workshop includes developing a business vision, analyzing financial statements, and creating a sound business plan.

To have a brochure faxed or mailed to you on the seminar, contact ALCA at 800/395-2522.

ALCA also released its 1998 *Who's Who in Landscape Contracting* membership directory. The directory provides ALCA members with an index of both interior and exterior landscape contractors, their areas of expertise and other pertinent information. Listings of supplier, affiliate, student, student chapter, and state association members are also included.

The directory is available to ALCA members for \$5 and non-members for \$35 plus S&H. To order a directory, contact ALCA at 800/395-2522.

Gerson to open PLCAA Conference

Richard Gerson, Ph.D., is slated to open the 19th Annual Conference of the Professional Lawn Care Association of America (PLCAA) in Nashville, TN, Nov. 13-17. Gerson is the president of Gerson Goodson, Inc., Clearwater, FL, and specializes in sales, marketing, customer service, quality improvement and communication skills.

Gerson is a nationally recognized speaker and corporate trainer. His clients include individual entrepreneurs as well as Fortune 500 companies. He has written five books about business management, and over 300 articles.

His presentation takes place at PLCAA's opening session on Saturday, Nov. 14, at the Opryland Hotel. PLCAA's Annual Conference, held in conjunction with the Green Industry Expo, offers pre-conference events as early as Friday, Nov. 13 with sessions running through Tuesday, Nov. 17. For more information, contact PLCAA at 800/458-3466.

Over 5,000 attend California Show

More than 5,300 people attended the 1998 Landscape Industry Show in Long Beach, CA. There were nearly 300 exhibiting companies.

Show attendance was up nearly 10 percent from 1997. "This is the 19th year we've produced this show and I am proud to report it was the best one yet," said show manager Kim Heckes.

Next year's Landscape Industry Show is set for March 31-April 1 at the Long Beach Convention Center. For information contact Kim Heckes at 916/448-2522.

Hey, Texas: PLCAA's got news for you!

The Texas Chapter of the Professional Lawn Care Association of America (PLCAA) holds its fourth Lawn and Ornamental Conference at the Southfork Ranch in Dallas Aug. 18. Attendees will receive pesticide recertification credits from the Texas Structural Pest Control Board and the Texas Department of Agriculture.

Call (800) 458-3466 for details.

On Aug. 20, the chapter will hold a joint education program with the Texas Association of Nurserymen and the Texas Association of landscape Contractors. The event coincides with the TAN-MISSLARK Trade Show in Houston, Aug. 21-23.

The new joint program offers up to six pesticide recertification credits from the above mentioned Pest Control Board and Dept. of Agriculture.

Call (512) 280-5182 for more information.

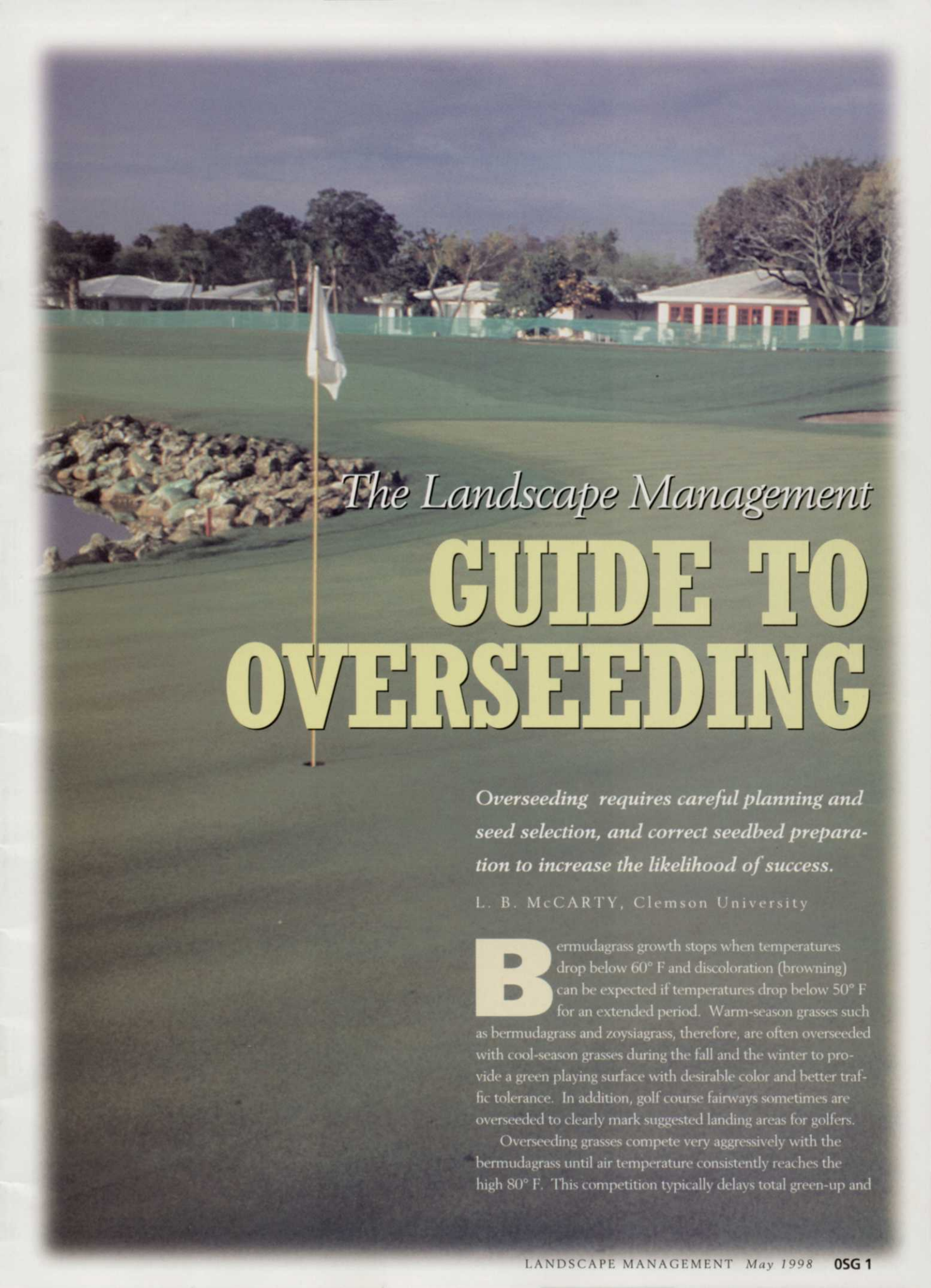
For information on joining the Texas Chapter of PLCAA, contact Heath Moore at (800) 458-3466.

MNLA tabs Landsburg as new president

Roger Landsburg is the 1998 president of the Minnesota Nursery and Landscape Association (MNLA). He is the owner of Landsburg's Nursery in Brainerd. He was first elected to the MNLA Board of Directors in 1992, and was chair of the 1998 Convention Committee. A graduate of Michigan State University (degree in horticulture), Roger and his wife Marie have been owners of their nursery and landscaping business for almost 20 years.

Other MNLA officers: Vice President, Dennis McNamara, Hoffman & McNamara Co., Hastings and Secretary/Treasurer, Jim Wilson, Wilson's Nursery, Chanhassen.

Bert Swanson, Nador, North of Park Rapids, joins the board of directors along with returning board members Gary Kuper, Park Nursery, Stillwater, MN; John Mickman, Mickman Brothers, Anoka, MA, and Tim Power, Law's Nursery, Hastings, MN.



The Landscape Management
**GUIDE TO
OVERSEEDING**

Overseeding requires careful planning and seed selection, and correct seedbed preparation to increase the likelihood of success.

L. B. McCARTY, Clemson University

Bermudagrass growth stops when temperatures drop below 60° F and discoloration (browning) can be expected if temperatures drop below 50° F for an extended period. Warm-season grasses such as bermudagrass and zoysiagrass, therefore, are often overseeded with cool-season grasses during the fall and the winter to provide a green playing surface with desirable color and better traffic tolerance. In addition, golf course fairways sometimes are overseeded to clearly mark suggested landing areas for golfers.

Overseeding grasses compete very aggressively with the bermudagrass until air temperature consistently reaches the high 80° F. This competition typically delays total green-up and

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- Exceptionally fine leaved appearance
- Lower growth habit
- Drought and heat tolerant
- Excellent mowability



- Excellent overseeding turf quality
- Very dark green color
- Lower growth habit
- Excellent seeding vigor
- Very good overall disease resistance
- Excellent shade tolerance and cold hardiness

GUIDE TO OVERSEEDING

fill-in of the bermudagrass and if the overseeding quickly dies, the bermudagrass stand generally is thin.

If an area is overseeded for only one year, it will normally take another two years for all of that overseeding seed to totally germinate. Therefore, courses will have reoccurring sporadic overseeding for up to three years after the last overseeding year. Escaped clumps ('renegade' ryegrass) of overseeding from the intended seeded areas also are unsightly, difficult to mow, difficult to eradicate, and often live into mid-summer.

Overseeding also is argued to reduce weed population due to the competition. This is rarely the case and in fact, overseeding usually slowly increases weed pressure. This is especially true for annual bluegrass which typically becomes a serious weed problem when courses overseed continuously for a number of years. This seed is then easily tracked onto green and tee surfaces, thus, increasing its occurrence in these areas.

Timing considerations

Seeding too early can result in excessive bermudagrass or zoysiagrass competition and the increased likelihood of diseases such as *Pythium* blight. Seeding too

late in fall may result in weak, delayed or reduced seed germination because of low temperatures.

Optimum overseeding time is when late summer/early fall night temperatures are consistently within the 50° F range. Or when soil temperatures at a four inch depth are in the mid-70's, or the average midday air temperatures remain in the low 70's. Cool-season grass seed germination is favored by temperatures between 50° and 70° F. Time overseeding at least 20 to 30 days before the first expected killing frost.

Three to six weeks prior to overseeding

1) Reduce or stop nitrogen fertilization three to four weeks prior to overseeding to minimize competitive bermudagrass growth. Excessive growth at the time of overseeding will provide competition for the germinating seed and predisposes the grass to winter injury.

2) Cultivate the soil by coring four to six weeks prior to overseeding. Allow the cores to dry and pulverize them by verticutting, power raking or dragging. Coring is performed in advance of the actual overseeding date to allow coring holes to heal over, thus preventing a speckled growth pattern of winter grass.

The overseeded grasses typically grow faster with a darker green color in and around cores holes.

3) Following coring, verticut in several directions to reduce thatch and to open the soil surface to allow better soil-to-seed contact. Remove verticut debris by raking, blowing or mowing with catcher basket attachments. Depth of verticutting depends primarily on the depth of thatch. Thicker thatch layering requires deeper verticutting. Other factors, such as algae formation, however, may dictate how severe this verticutting is. If algae is a problem, light, frequent grooming may substitute for verticutting greens.

4) Topdress with approximately ½-cubic yard per 1000 square feet following the removal of the verticut debris. This provides a smooth seedbed and minimizes effects of the remaining thatch. Most consistent results occur when the seedbed is topdressed before and immediately after overseeding to provide desirable soil contact. Use desirable topdressing mix; e.g., contains <10 percent of particles small than 0.1 mm and none above 1 mm in diameter.

5) Apply phosphorus (P₂O₅) and



Overseeding provides desirable year-round color, some protection to the permanent grass, and suggested landing areas for players.

Advice & supply outlook from suppliers

LM: What facet of the golf course overseeding process is most important to the success of a project?

► "Sometimes superintendents will choose a poor quality mixture, maybe with higher fluorescence or contaminants that result in a lower price. And the superintendent, to meet budget requirements, cuts it too thin. In some cases they'd be better off using 5 percent less seed than going for a 5 percent cheaper price. The newer varieties have much better color and density and as a result of their better genetics they're more difficult to control in transition without using chemicals.

—John Zajac, Zajac Performance Seeds

► "Initial seed establishment is critical. Timing, procedure and seed quality are all most important. Poor quality seed of inferior varieties will show poor results all year long. Once poor quality seed is planted, there is no going back.

► "Timing is also very important.

Seeding too early will cause high seedling mortality due to disease, competition and heat stress. Planting too late means an incomplete establishment. At Pickseed, we custom blend and mix seed to our customers specifications. We use only top quality seed of good varieties. We are available to assist and answer any questions or problems as they arise.

—Dr. Jerry Pepin, Pickseed West

► "All perennial ryegrasses will germinate quickly. In overseeding, when downtime equals money, rapid tillering and establishment are important.



GUIDE TO OVERSEEDING

potassium (K_2O) at a suggested rate of 10 pounds of 0-9-27 (or equivalent) per 1000 square feet, or at the rate suggested by a soil fertility test. Test the soil about four weeks prior to overseeding. Phosphorus and potassium enhance overseeding rooting without promoting excessive bermudagrass or zoysiagrass top growth.

10 to 14 days prior to overseeding

1) Approximately 10 days to 14 days prior to overseeding, reduce the mowing height and verticut lightly in two directions (just touching the soil surface) to open the turf and to allow the seed to fall into the turf canopy. This practice provides good seed-to-soil contact, minimizes wind and water from carrying seed away, and provides sufficient time for verticut slits to recuperate before overseeding.

2) Next, use a power sweeper, a mower with basket attachments, or blower to remove remaining debris, and then irrigate thoroughly.

3) On sloped areas, if possible, discontinue mowing two or three days prior to overseeding, or raise the mowing height $\frac{1}{4}$ or $\frac{5}{16}$ inch one week prior to overseeding to provide an upright framework of grass to prevent seed from washing.

4) Spiking or slicing in several directions just prior to seeding also enhances seed-to-soil contact. Care, however, might be taken to evenly distribute seed without concentrating it in spiked holes to prevent a speckled appearance.

Overseeding with small-seeded species such as fine fescue or *Poa trivialis* often does not require as extensive seedbed preparation as larger seeded grasses like ryegrass. However, some seedbed preparation is needed for all species with the last two steps listed above being minimum requirements for all overseeding. The greater the thatch layer and the use of larger seeded species require more seedbed preparation.

Preparing fairways

Fairways require an aesthetically pleasing appearance but are not prepared as intensely for overseeding as greens and tees are. However, preparation is needed



Overseeding seedbed preparation involves various degrees of aerifying, verticutting, and topdressing to reduce soil compaction, discourage bermudagrass competitive growth, reduce thatch, and provide good seed-to-soil contact.

to provide for uniform germination and overseeded grass establishment.

1) Mow the base grass very close just prior to overseeding and pick-up clippings and debris. This also will open up the turf and will allow seed to reach the soil, provided thatch is not a problem.

2) If thatch is a problem, core several weeks in advance of overseeding. Break up dried cores by dragging a piece of chain link fence or a flexible metal mat over the surface. Soil from this coring also provides a good germination media for the overseeded grass.

3) Excessive fairway thatch may require verticutting in conjunction to close mowing and coring prior to overseeding.

Perennial ryegrass

Perennial ryegrass has been the preferred overseeding grass. It germinates fast (typically five to seven days), has a fine leaf texture, dark green color, seedling vigor, and better disease and traffic resistance than annual ryegrass. Perennial ryegrass also provides a highly desirable striped appearance when mowed in alternating directions.

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Chaparral	Very dense, low-growing, dark green turf. Lowest vertical growth in turf. Tested as 2DLM
Charger	Good low fertility and cool weather performance / Improved disease resistance
Charger II	Dark, dense, dwarf turf ranks high in winter overseeding trials. Experimental code 2QM.
Citation III	Excellent heat and wear tolerance / Improved disease resistance / Rich, dark green color
Manhattan 3	Very dense growth habit / Rich color / Good mowing qualities / Contains endophyte
Navajo	Dark green, disease resistant turf / Excellent for overseeding / Good shade tolerance
Quickstart	Heat tolerant / Establishes quickly / Disease resistant / Excellent for overseeding
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Sunrye (246)	Dark green color / Dwarf growth habit / Contains endophyte / Disease resistant

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GUIDE TO OVERSEEDING

Last fall, we saw distinct differences between perennial ryegrass varieties in their ability to tiller the three to four weeks after planting.



At that stage of establishment, Charger, Charger II, Sunrye (246), Roadrunner and Citation III are the first varieties to partition energy into stems for seed production. This weakens the plants, making them susceptible to high temperatures which start the spring transitioning process."

—Crystal Rose-Fricker, research director, Pure Seed Testing West.

► "Buy your seed off a test, not just a tag. A purity test will indicate the presence of *Poa annua* in a lot where an analysis tag may not. Some



Annual (Italian) ryegrass

Annual ryegrass (*Lolium multiflorum*) has lost some of its importance in recent years as an overseeding grass since it produces a coarser, more open turf than many newer turf-type perennial ryegrasses and is extremely susceptible to pythium diseases. Annual ryegrass has poor heat and cold tolerance and often experiences early spring death which may result in poor seasonal transition. It dies quickly when a few warm days occur in early spring. This may result in thin spots where the bermudagrass has not had time to fully green-up and cover any weak areas. Annual ryegrass germinates quickly and is acceptable on fairways and other general use areas where color and appearance are not of greatest concern, or when budget constraints are important. Few improved turf-type cultivars of annual ryegrass are currently available.

Forage-type cultivars include Astor, Gulf, Magnolia, and Wimmera.

Intermediate ryegrass

Intermediate ryegrass (*Lolium hybridum*) is a hybrid of annual and peren-

nial ryegrass. Like annual ryegrass, intermediate ryegrasses germinate quickly but lack heat tolerance. Intermediate ryegrass makes a sharper transition than the turf-type perennial ryegrasses. Intermediate ryegrasses also have a medium texture, a lighter green color and reduced shoot growth. Due to its heat intolerance, intermediate ryegrasses disappear quickly as bermudagrass begins to grow in the spring. They do not retard bermudagrass as much as more heat tolerant turf-type perennial ryegrasses. Higher budgeted fairways are the main use areas of intermediate ryegrass. Several varieties of intermediate ryegrasses are available, including: Agree, Froghair, Midway, Oregreen, Savvy, and Transtar.

Fine fescue

Fine fescue is a general term used for several fine-leaved *Festuca* spp. that have delicate and wiry leaves that are usually less than 0.5mm wide and have a clumping, bristle-like appearance. Red fescue (*F. rubra* L.) and spreading fescue (*F. pratensis* Huds.) have slow spreading rhizomes while chewings fescue (*F. rubra*

CHARACTERISTICS OF SELECTED GRASSES USED FOR WINTER OVERSEEDING.

Grass Species	Perennial Ryegrass (turf-type)	Annual Ryegrass	Intermediate Ryegrass	Fine Fescue	Roughstalk Bluegrass (<i>Poa trivialis</i>)	Creeping Bentgrass
Green Color	Dark	Light	Intermediate	Light-Dark	Light to intermediate	Intermediate
Texture	Med.-Fine (2-4mm)	Coarse (3-5mm)	Coarse-Med. (3-4mm)	V. Fine (1-2mm)	Fine (1-4mm)	V. Fine (1-2mm)
Density	Good	Poor	Fair	Excellent	Excellent	Excellent
Establishment Rate	Fast (3-4 weeks)	Very Fast (2-3 weeks)	Fast (2-4 weeks)	Slow (4-6 weeks)	Slow (4-6 weeks)	Very Slow (6-8 weeks)
Winter Performance	Good-Excellent	Fair-Good	Fair	Fair	Fair	Fair
Spring Performance	Good-Excellent	Poor	Fair	Good	Excellent	Fair
Spring Transition	Slow	Medium	Medium	Fast	Fast	Slow
Wear Tolerance	Fair-Excellent	Poor-Fair	Fair-Good	Fair	Poor	Fair
Shade Tolerance	Fair-Good	Fair	Fair	Very Good	Good	Fair
Putting Quality	Fair-Excellent	Poor	Poor-Fair	Good	Excellent	Excellent
Competitiveness with <i>Poa annua</i>	Very	Very	Very	Not Very	Not Very	Not Very
Leaf Fraying	Moderate -minimum	Heavy	Moderate	Minimum	Minimum	Minimum
Disease Resistance	Fair-Good	Poor	Fair	Fair	Poor-Fair	Fair



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GUIDE TO OVERSEEDING

states do not require that *Poa* be listed on a tag. A reputable dealer will provide the purity paperwork of a given lot on request."

—Duane Klundt, national sales manager, Turf-Seed

► "Pre-planting preparation is critical. Also important is the timing of the overseeding. If the area is overseeded at the wrong time, the results will be poor. Disease control during the grow-in process is also important."



—Dr. Richard Hurley, executive vice president, Lofts Seed

► "Preparation steps are extremely important. Adherence to the preparation process during overseeding is critical. The timing of the seeding, fertilizing and mowing directly affect the success of the overseeding procedure."

—Joe O'Donnell, manager, Sunbelt Seeds branch of Lofts Seed.

► "Never buy VNS (variety not stated). If the variety—or varieties in a blend—are not stated on the seed analysis tag, anything could be in that bag. Unnamed ryegrasses could be low-quality imports, uncertifiable buffer strips from production fields, or pirated products that bypass turf breeders' royalties. These may be sold for a few pennies less a pound than named cultivars that pass through the quality checks imposed by certification and reputable marketing companies.

► "Order early to get the one that will work best on your course. Although it's difficult to ascertain availability until the crop is 'in the barn,' marketers like Turf-Seed, with their own research arm to predict yields, veteran contract growers and fieldmen to keep production standards high and established distributor/dealer network to get the



Seeding should be made in several directions to ensure uniform application. A drop spreader is also used to define the perimeter of the overseeded area.

ssp. *communtata* Gaud.), sheep fescue (*F. ovina* L.), and hard fescue (*F. longifolia* auct. non Thuill.) have a bunch-type growth habit. As a group, the fine fescues are noted for good shade tolerance, low-mowing height tolerance,

goods to market, will come through for the winter overseeding market year after year."

—Tom Stanley, marketing manager, Turf-Seed

► "The single most limiting factor of overseeding is the condition of the dormant warm-season turf! If your foundation of warm-season grasses is good, you will be successful in a long-term overseeding program. Seedling establishment and transition will benefit from a healthy base of warm-season grass. For example, if you have 'Indian Summer,' and the course requires more renovation, verticutting and aerification than normal, the long term detrimental effects on turf quality as a result of this change in management practice are minimal. Applications of the growth regulator Primo or late season use of desiccants such as Reward

winter hardiness, and adaptability to infertile and dry soil conditions. They do not tolerate heat or wet, poorly drained soils well but are particularly adapted to dry, shady conditions as well as to low-maintenance situations. Fine fescues rarely are used alone for overseeding but are usually mixed with other cool-season grasses such as perennial ryegrass, and bentgrass. Fine (red, chewings, or hard) fescues, particularly chewings fescue, provide a fine texture, and a stiff, upright growth habit which increases fall putting speeds. Density is good to excellent, but establishment rate is moderate. Fine fescues, as a group, provide good spring transition. They should not, however, be used if the herbicide ethofumesate (Prograss) is to be applied for annual bluegrass control. Fine fescue normally is used as a mixture with perennial ryegrass to improve desirable characteristics of a putting surface.

Bentgrass

Because of its fine texture and low growth habit, bentgrass often is used to provide a permanent or temporary overseeded putting surface. Bentgrass (especially, Seaside and Mariner) also has good salt tolerance. However, bentgrass is slow

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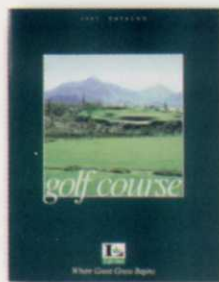
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GUIDE TO OVERSEEDING

may be in the cards. These tools have little detrimental effect on a healthy base of warm-season turfgrass.”

—Craig Edminster, *International Seeds*

▶ “Optimum seedbed preparation and the initial two feedings; a thatched or verti-cutted warm-season turfgrass stand; exposed areas for best soil/seed contact. The first two feedings within six weeks establishes over-seeded ryegrasses for optimum coverage.”

—Zenon Lis, *agronomist/marketing manager, Burlingham Seeds*

▶ “The most important step in the overseeding process is choosing the right seed. We understand perfectly well that the steps such as dethatching, aeration, fertilization, irrigation, etc., are extremely important...but even with the best preparation and all the hard work a superintendent puts into overseeding, the results will not be up to par without top quality seed.”

—Ronnie Stapp, *executive vice president, seed operations, Pennington Seed*

- ▶ 1/ Variety selection,
- 2/ Purity of seed,
- 3/ Site preparation,
- 4/ Timing

“Any of these things done wrong can cause problems. Hit them all right and you’ll be successful.”

—Stephanie Ward, *Seed Research*

▶ “At TMI, we believe the most successful thing we can do for our superintendents and other landscape professionals is to have our high quality seed at their doorstep when they need it. Since the weather can be most fickle, if the conditions are right, the overseeder must move quickly to get the seed down, and he/she can’t do it if the seed is still in Oregon somewhere waiting for someone to ship it! TMI has a most exceptional record for on-time deliveries of premium seeds...”

—Steve Tubbs, *Turf Merchants, Inc.*

TURF-TYPE PERENNIAL RYEGRASS CULTIVARS

Cultivars: Accent, Advent, Affinity, Allegro, Alliance Brand, All Star, Assure, Barredo, Barrage, Barry, Belle, Birdie I-II, Blazer, Brightstar I-II, Caddieshack, Caliente, Calypso, Catalina, CBS II blend, Celebration Blends, Chaparral, Charger I-III, Citation I-III, Commander, Competitor, Cowboy, Cutless, Dandy, Danaro, Dasher I-II, Delray, Derby, Diplomat, Duet, Elegance, Elka, Equal, Essence, Excel, Express, Fiesta I-II, Gator, Gettysburg, Goalie, Lindsay, Linn, Loretta, Low Grow, Manhattan I-III, Navajo, Nobility, Nomad, Omega I-III, Ovation, Palmer I-III, Panther, Patriot II, Pebble Beach, Pennant II, Pennfine, Pinnacle, Pleasure, Prelude I-III, Premier, Quickstart, Regal, Repell I-III, Riviera, Roadrunner, Rodeo II, Saturn II, Seville, Sherwood, Shining Star, Stallion, Stardance, Sunrye (246), Surprise, Symphony, Tara, Target, Toronto, Troubadour, Wizard, Yorktown I-III

Comment: More than 200 cultivars of perennial ryegrass are available and this list is very dynamic. When used for overseeding, newer cultivars have better heat and disease tolerance, therefore, may remain longer into the summer season than desired.

to establish and is susceptible to many diseases. In addition, it is usually slow to transition in spring when compared to most other grasses used for overseeding. In warmer regions, the lack of extended cold temperatures may allow the bermudagrass to stay competitive throughout the winter. This may result in small, immature bentgrass seedlings that tolerate traffic poorly and are more susceptible to diseases and to over-watering.

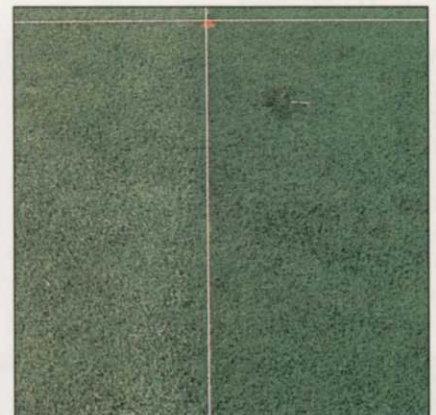
If a bentgrass is used for overseeding, Redtop (*Agrostis alba*) is more vigorous, less expensive, and less competitive in the spring. Numerous bentgrass varieties

have been introduced in the last decade. ***Poa trivialis* (roughstalk bluegrass)**

Poa trivialis (often called roughstalk bluegrass, rough bluegrass, or ‘Poa triv’) has a fine texture, good density, and is more cold tolerant than ryegrass). This is due, in part, to its high seed count, at approximately 8-to-1, compared to perennial ryegrass. This gives it a greater density in the number of seed per square foot than ryegrass. It is easier to establish in the fall compared to ryegrass since radical increases in mowing heights are not necessary and golfers like it due to minimum seedbed preparation needed for establish-



Annual bluegrass (*Poa annua*) is the most troublesome weed problem in overseeded areas due to its prolific seedhead production, clumping growth habit, and early spring die-back.



Perennial ryegrass (right half) compared to annual ryegrass (left half) used for overseeding.

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ment. Roughstalk bluegrass also tolerates poorly drained soils and has good shade tolerance. These characteristics make it desirable as a component of an overseeding mixture (typically 15 to 30 percent) with perennial ryegrass or with bentgrass. However, *Poa trivialis* is susceptible to diseases, especially dollar spot. It has poor wear tolerance and a natural yellow-green color. Hot spots, or dry areas, may develop and require daily hand syringing. It also tends to die-out earlier in the spring than most other overseeding grasses due to its low heat tolerance. This low heat tolerance normally is desirable since spring transition is quicker and smoother. However, extended warm weather into the fall and early warm weather in the spring may prematurely weaken it. *Poa trivialis* also is susceptible to damage when Prograss herbicide is used for annual bluegrass control. Numerous varieties of *Poa trivialis* are currently being developed and released. Improved cultivars include Colt, Cypress, Darkhorse, Laser, Laser II, Polder, Polis, ProAm, Sabre, Sabre II, Snowbird, Star Dust, and Winterplay.

Poa supina

Recently, *Poa supina* Schrad. has been evaluated as a potential species in overseeding and as a permanent turf. *Poa supina* is native to the European Alps. It has short stolons, short internodes, resistance to many diseases, and has good wear and shade tolerance. Like *Poa annua*, *Poa supina* has a very short or restricted root system, requiring frequent, light watering, possesses poor drought tolerance, is persistent, and often invasive. For these reasons, *Poa supina* is not recommended unless shaded conditions do not allow other grass species to persist. Supranova is an available cultivar.

Blend and mixes

Blends (two or more cultivars of the same grass species) of perennial ryegrass, or mixtures (two or more cultivars of different grass species) of bentgrass and *Poa trivialis* (roughstalk bluegrass), or mixtures of perennial ryegrass and fine fescue

BENTGRASS CULTIVARS USED FOR GOLF COURSE PURPOSES

(note: check with you seed supplier and state turfgrass specialist for the latest recommended cultivar(s) for your particular area and needs).

CREEPING BENTGRASS (*Agrostis palustris* subsp. *stolonifera* L.)

Cultivars: Penn A & G Series (A-1; A-4; G-1; G-2; G-4; G-6), Backspin, Carman, Cato (Syn 4-88), Century, Cobra, Crenshaw (Syn 3-88), Dominant (SR1019 + SR1020), Emerald, L-93, Lopez, Mariner, National, Penncross, Penneagle, Pennlinks, ProCup, Prominent, Providence (SR1019), Putter, Regent (Normark 101), Seaside, Southshore, SR 1020/1119, Trueline, Viper

Comment: Bentgrass used alone for overseeding purposes generally perform poorly as they establish very slowly and then compete aggressively with the bermudagrass during transition. Blends with *Poa trivialis* or fine fescue generally perform better than pure bentgrass. This list is very dynamic as new varieties are continually being released and others discontinued.

COLONIAL BENTGRASS (*A. tenuis* Sibthorp)

Cultivars: Allure, Astoria, Bardot, Barostis, Boral, Egmont, Exeter, Heriot, Highland, Holfior, SR7000/7100, Tendenz, Tracenta

Comment: These are bunch grasses that tend to grow more upright and require less water and fertility than creeping bentgrass. They generally do not tolerate close mowing as well as creeping bentgrass. They have been used mostly as a component of mixtures for fairways and general turfgrass areas in coastal areas of the Pacific Northwest, Northeast, and northern Europe (summer temperatures less than 85 F). Newer cultivars may prove better adapted to other regions and other uses.

VELVET BENTGRASS (*A. canina* subsp. *canina* L.), Dryland or Highland Bentgrass (*A. castellan*), Brown top (*A. capillaries*), Red top (*A. alba* L.)

Cultivars: Acme (velvet), Barracuda (red top), BR 1518 (dryland), Egmont (brown top), Kernwood (velvet), Kingston (velvet), Piper (velvet), Raritan (velvet), Sefton (brown top), SR7200 (velvet), Streaker (red top)

Comment: These produce some of the finest textured turfgrasses used for putting surfaces due to upright growth habit and dense stand. However, due to lack of heat, disease, and traffic tolerance, they are used mostly in upper New England and the Pacific Northwest, New Zealand, Australia, and in other places as a part of blends. Velvet bentgrass is also noted for its shade tolerance. Red top establishes quickest of the *Agrostis* species and performs well on wet, poorly drained sites.

IDAHO BENTGRASS (*Agrostis idahoensis*)

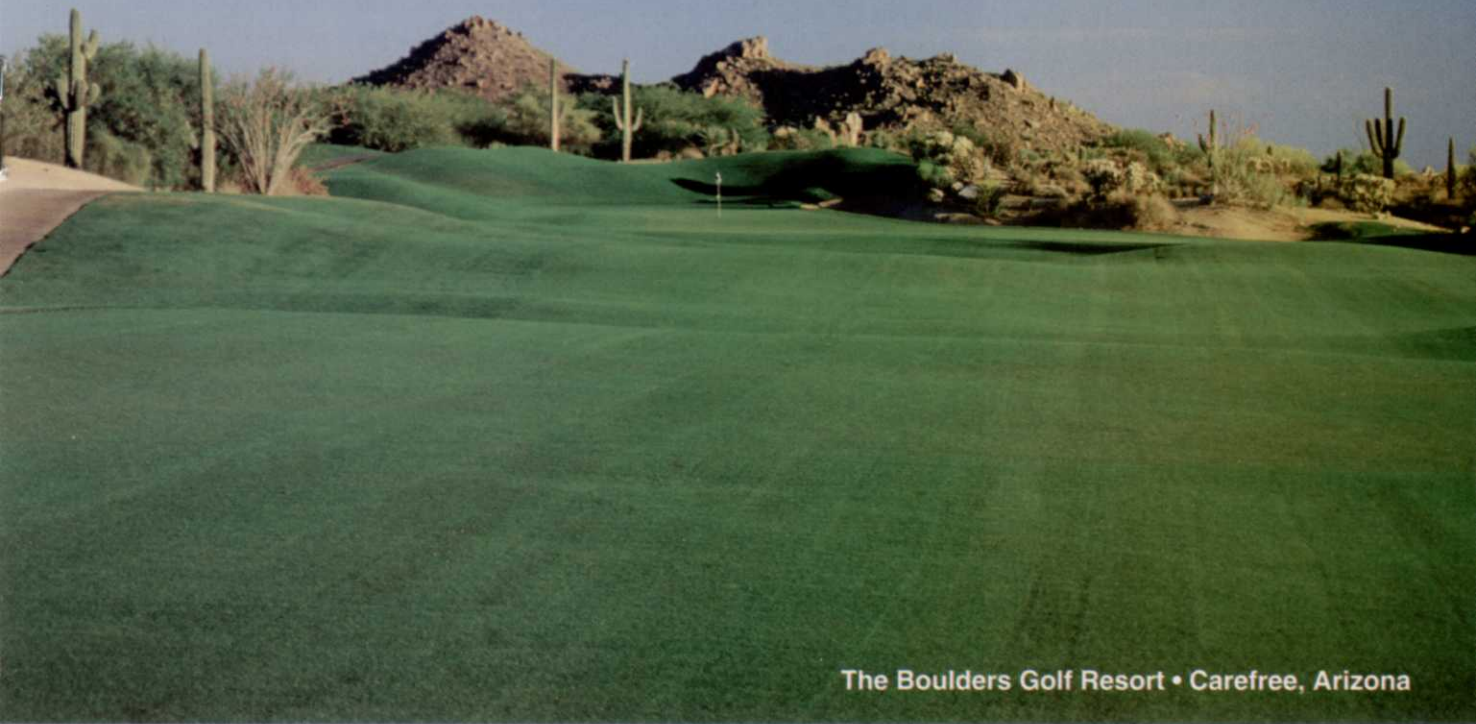
Cultivar: GolfStar

Comment: A new turf species, Idaho bentgrass has a fine texture, upright leaves, dark-green color and non-creeping (bunch-type) growth habit. Useful for winter overseeding or as a low maintenance permanent turf in fairways or roughs.

are commonly used as a measure of protection against disease and environmental stresses. They also are used to enhance fine texture and smoothness. Mixtures typically consist of 70 percent to 90 percent perennial ryegrass, 20 percent to 30

percent fine fescue and 20 percent to 30 percent *Poa trivialis*. If spring transition is a problem, reducing or eliminating the ryegrass component may be considered. An 80 percent fine fescue and a 20 percent roughstalk bluegrass (by seed

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to us. We've found that the Seed Research perennial ryegrasses have excellent seedling vigor and tiller-out more quickly. We understand that it's due to the high levels of endophyte present in the components of Champion G.Q.”

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Ed Miller
Director of Golf Course Operations
Carefree Resorts
Phoenix, Arizona

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▶“The most important facet is quickness, in two respects: the seed has got to get to the distributor or golf course as soon as it has been cleaned to tournament quality in the Fall. The other most important key to success is getting a perennial ryegrass that can establish itself very rapidly. Many ryegrasses, while showing good color, do not have a quick enough green up. We feel that breeding work that concentrates on quick establishment while maintaining good color is the most important facet of any golf course superintendent’s success in overseeding. Coupled with fast establishment, we focus on all the common disease resistance traits that many turf seeds lack.”
—Cory Sonnen, Western Productions, Inc.

LM: What can you tell LM readers about the availability of overseeding varieties for 1998?

▶“There is virtually no carryover going into new season. With carryover comes mixing, blending, harvesting to make the supply window. This year we have less inventory to start the season. Supply continues to meet demand.

▶“Our Confidence and Leaderboard blends should be pretty good once they are cleaned, mixed and blended.

▶“A new ryegrass called Bullet is an easier to transition ryegrass that will be available in the fall.”

—John Zajac, Zajac Performance Seeds

▶“Availability in 1998 should be good. Our supply of Darkhorse *Poa trivialis* will be much better. Due to problems at the Oregon State University Seed Lab it will be very difficult to have certified blends and mixes available early in the year. The seed laboratory is a real ‘bottleneck’ to seed certification early due to its lack of capacity.”

—Dr. Jerry Pepin, Pickseed West

▶“We are pleased to see a really good use of turf-type perennial rye this year. The supply of seed was very adequate

for a strong demand, but we are selling out on most of our top varieties. The acres are there, in Oregon, for an adequate supply again, but with the strange El Niño-driven weather we have experienced, the yields may not be up to par. We expect to have a good supply of our Morning Star, Shining Star and Wind Star perennial ryegrasses. Our supplies of our newest varieties, Wind Dance and Sonata, will be less than anticipated.

▶“We have a nice production acreage of Winterplay *Poa trivialis* which looks good presently, but as fickle as *Poa trivis* are, we will have to wait and see.

▶“We expect usage of perennial rye and *poa trivialis* to grow again this year. As a result, the demand for seed will be strong and the expected supply should be about equal to last year.”

—Ronnie Stapp, Pennington Seed

▶“Our Symphony and Celebration perennial ryegrass blends have had a tremendous acceptance in the trade. Professional turf managers have truly been amazed at the turf color in Burlingham’s lineup. We’ll have adequate supplies for fall.”

—Zenon Lis, Burlingham Seeds

▶“In the perennial ryegrass category, we have good supplies of: Top Hat; R2; Essence; Derby Supreme; PhD; and Gator II. Our supply of Sabre II *Poa trivialis* is good. Our Tiger colonial bentgrass supply is also looking good.

“In the creeping bentgrass department, our Viper and CEO supplies are good; Cobra supply is tight. We also have good supplies of our overseeding mixtures: PhD with Sabre; Dixie Green with Sabre II; and Showboat.”

—Craig Edminster, International Seeds, Inc.

▶“We expect excellent supplies of our ryegrasses (Palmer III; Prelude III; Repell III and Yorktown III; and Laser *Poa trivialis*).”

—Dr. Richard Hurley, Lofts Seed

weight) mixture will provide a quicker, smoother spring transition. Roughstalk bluegrass also is typically mixed with perennial ryegrass and bentgrass to enhance their performance and to provide a more desirable spring transition. A typical seed weight formula is 85 percent perennial ryegrass plus 15 percent bluegrass, or 60 percent bentgrass plus 40 percent bluegrass. Since no one grass provides all optimum characteristics necessary for overseeding, turf managers often choose different mixtures or blends.

Seed quality

Use only certified (blue tag) seed when selecting species and cultivars for overseeding. Specify maximum percent purity and acceptable germination at the time of purchase. Seed also should be certified as free of hard-to-control weeds such as annual bluegrass.

Request fungicide-treated seed to reduce potential seedling loss due to *Pythium* and *Rhizoctonia* diseases. Metaxyl (Apron), or etridiazole (Koban), are fungicides commonly used for this purpose. Bentgrass used for overseeding nor-

Poa trivialis (left) compared to bentgrass (right). Both have gained in overseeding popularity due to their fine leaf texture, good density, close mowing tolerance, and minimum seedbed preparation needed for establishment. Bentgrass, however, can be slow to establish and transition in spring while *Poa trivialis* can transition quickly in spring but is very susceptible to dollar spot disease.



SUGGESTED OVERSEEDING RATES FOR VARIOUS GRASSES AND MIXTURES (BY SEED WEIGHT) USED ON GOLF COURSES.

Grass	Greens	Tees	Collar/Aprons	Fairways
	lbs. per 1000 sq.ft.-lbs/acre			
Perennial ryegrass	25 - 40	15 - 20	10 - 20	250-450
Italian (Annual) ryegrass	35 - 50	15 - 25	15 - 25	250-400
Chewings (Fine) fescue	25 - 30	10 - 20	5 - 20	—
Bentgrass	2 - 5	2 - 3	2	—
<i>Poa trivialis</i>	8 - 12	5 - 7	4 - 7	—
Typical mixture for enhanced performance and better spring transition: 75% Perennial ryegrass + 25% Chewings fescue				
	30 - 40	10 - 20	10 - 20	150-250
Typical mixture for enhanced performance and better spring transition: 75% Perennial ryegrass + 25% <i>P. trivialis</i>				
	30 - 40	10 - 20	10 - 20	150-250
Typical mixture for better performance in shady or wet areas: 60% bentgrass + 40% <i>P. trivialis</i>				
	5 - 7	3 - 4	2 - 4	—
Typical mixture for widely adaptable to poorly drained or shady areas: 60% <i>P. ryegrass</i> + 25% chewings fescue + 15% <i>P. trivialis</i>				
	25 - 30	10 - 15	10 - 15	150-250
Typical mixture for enhanced fall establishment and better spring transition: 80% Chewings fescue + 20% <i>P. trivialis</i>				
	20-25	8-10	8-10	150-200

mally isn't treated with a fungicide. Extra seed (approximately 10 percent) also should be purchased for repairing small areas that may be lost from pests, weather or traffic. Protect all seed from rodents and store in a cool, dry place.

Spring transition

In spring you want a gradual and smooth transition from overseeded grasses back to bermudagrass turf. Dormant bermudagrass shows signs of 'green-up' when soil temperatures reach the 60° F range. Some overseeded grasses, especially the new and aggressive heat tolerant perennial ryegrasses, can

successfully compete with bermudagrass through the spring. This results in a poor transition. Golf greens seeded with mixtures containing bentgrass often experience the same problem. However, on the other hand, mixtures high in *Poa trivialis* or fine fescue are difficult to maintain once temperatures reach the 80° F range. During these times, these grasses become very sensitive to management practices designed to encourage bermudagrass recovery. As early spring approaches, a cultural program is initiated using lower mowing heights, brushes, topdressings and the use of other reel implements such as grooved rollers. The following procedures have proven beneficial in encouraging bermudagrass at the expense of overseeded grasses with minimal disruption to the turf:

1) Use the appropriate seed or mixture. Reducing the amount of perennial ryegrass or bentgrass in an overseeding

mixture aids spring transition. Intermediate ryegrass, fine fescues, and roughstalk bluegrass are less heat tolerant and therefore tend to transition earlier than perennial ryegrass or bentgrass. A 75 percent to 85 percent perennial ryegrass plus 15 percent to 25 percent roughstalk bluegrass, or 60 percent bentgrass to 40 percent bluegrass mixture transitions better in spring, yet provides a desirable putting surface. For those greens with good drainage and less traffic, an 80 percent fine fescue plus a 20 percent roughstalk bluegrass provides a quicker, smoother spring transition.

2) Temperatures (both day and night) are the most important criteria influencing overseeding. Time management practices around traditional temperature patterns and short-term weather forecasts. Probably the most important temperature range to remember is that bermudagrass will not aggressively begin to grow until night temperatures consistently reach the mid 60s. Bermudagrass shoots will 'green-up' much sooner, when daytime temperatures reach the mid 50s. Members become excited with

Intermediate ryegrass is a hybrid of annual and perennial ryegrass. Intermediate ryegrass germinates quickly but lacks heat tolerance and often has a light green color.



GUIDE TO OVERSEEDING

AIR AND SOIL TEMPERATURES (° F) AFFECTING TURFGRASS GROWTH AND DEVELOPMENT.

Turf Response	Cool-Season Grasses		Warm-Season Grasses	
	Air Temperatures	Soil Temperatures (4-inch depth)	Air Temperatures	Soil Temperatures (4-inch depth)
Suggested for planting	75 to 80	60 to 70	80 to 90	70 to 80
Optimum for shoot growth	60 to 75	—	80 to 95	—
Optimum for root growth	—	50 to 65	—	75 to 85
Low temp. kill possible	—	20	—	25
Shoot growth ceases (min.)	40	—	55	—
Root growth ceases (min.)	—	33	—	35 to 50
Expected spring root decline is triggered	—	—	—	64
Chilling injury possible/dormancy initiation	—	—	50	—
50% bermudagrass kill	—	—	—	18 to 23
50% zoysiagrass kill	—	—	—	12

the first warm spell of the season and this puts added pressure on the superintendent to hasten transition. However, bermudagrass will not aggressively grow (especially laterally) until the high 60s F are consistently reached at night. Don't begin your transition steps until just be-

fore these temperatures are anticipated or bare areas may become exposed and will not recover until temperatures are high enough to favor bermudagrass growth. Also, if a late cool snap occurs and night temperatures drop into the 50s or low 60s, it will require 3 to 7 days of high 60s

for the bermudagrass to grow actively.

3) Begin reducing the mowing height several weeks before the expected spring transition period. Begin in mid-to-late February by reducing the cut height $\frac{1}{2}$ -inch every 2 weeks until a height of $\frac{1}{2}$ -inch or $\frac{3}{8}$ -inch is reached in late March. Maintain a short mowing height until at least 50 percent of the overseeded grass has been removed (e.g., early May). The mowing height might be raised back to $\frac{3}{8}$ -inch as the bermudagrass begins to recover, but should not be raised while the overseeded grass still dominates. A lower mowing height reduces overseeding shading of developing bermudagrass, warms the soil, and inhibits the growth of the overseeded grasses. The use of grooved rollers and brushes also improves the putting surface and helps maintain the overseeded grass in an upright growth habit.

4) Cultivation. Spike approximately three weeks before bermudagrass normally begins to green-up and every week following to enhance soil warming and turf recovery. Spiking also reduces surface compaction and algae growth. Aerify several weeks before expected spring green-up to promote bermudagrass growth by warming the soil and reduce the competition from the overseeded grass. Use small ($\frac{1}{4}$ -inch) tines with good soil moisture. The superintendent and

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TURF TYPE TALL FESCUE

Yuma
Improved turf-type bermuda

VIRTUE
TURF TYPE TALL FESCUE

Blue Star
Kentucky Bluegrass

Blue Bonnet
KENTUCKY BLUEGRASS

Morning Star
Perennial ryegrass

Misty
Improved Kentucky Bluegrass

ENVIRO-BLEND™
TURF TYPE TALL FESCUE BLEND

CERTIFIED
Bermuda Triangle
Professional Quality Bermudagrass Blend

ABANDANA
TURF TYPE TALL FESCUE

PANAMA
TURF TYPE BERMUDAGRASS

Sonata
TURF TYPE PERENNIAL RYEGRASS

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► "Supplies will be similar to last year. The crop looks good, but there is not substantial carryover and therefore, the demands for seed early in the overseeding season can again be a concern. It can be difficult to accommodate overseeding demands immediately after harvest."

—Joe O'Donnell, Sunbelt Seeds

► "With the completion of additional cleaning/blending lines this winter, TMI can ship more than a million pounds per day of freshly harvested overseeding grasses to all major overseeding markets. Perennial ryegrass and *Poa trivialis* are processed on a 24-hour basis, and the seed can be shipped truck/rail from the

multiple processing sites. The current production looks excellent, and TMI expects full late July availability of all of its ryegrasses, such as Affinity, Paragon, Allaire II and Manhattan 3, but also July availability of its top-performing *Poa trivis*, Stardust and Cypress."

—Steve Tubbs, TMI

► "Our overseeding varieties Westlawn WP200 permanent perennial ryegrass and Westlawn RSII transitioning perennial ryegrass and SUN-IN blend are in good supply. However bookings have been made against the crop. Newer production fields look clean and tournament quality seed is available. GOOD-EN and WPEZE turf-type tall fescue

club pro should coordinate spring tournaments around aerification times to minimize play disruption.

5) **Fertility.** Maintain low fertilizer application rates in late winter through early spring to reduce overseeded grass growth. Liquid iron will aid in maintaining desirable green color without excessive flush of growth. When bermudagrass growth is apparent, restore fertilizer applications. About two weeks after initiation of spiking, fertilize with 1/2-lb. of soluble N per 1000 square feet to stimulate new bermudagrass growth. Fertilize weekly at this rate until an adequate bermudagrass cover is achieved.

6) **Verticutting.** While overseeded grasses still are actively growing, initiate light and weekly verticuttings to help maintain the overseeded grasses in a upright growth habit which allows increased sunlight and warmth to penetrate through to the soil and thus encourage an earlier and more rapid regrowth of the bermudagrass. Begin verticutting when daytime temperatures are consistently above 70° F. Another method of judging when to initiate verticutting is when the non-overseeded adjacent fairways green-up. This verticutting should be no lower than 1/16 inch below the bedknife. It should cut above the soil surface and remove only surface leaves and not remove or damage bermudagrass stolons. Light verticutting, in addition to aiding the

bermudagrass, also will improve the putting quality of greens. Light topdressings on a two to three-week basis at approx. 1/8-yd./1000 sq.ft. also helps maintain a desirable putting surface.

Note: Although traditional light, frequent verticutting and core aerification may promote the gradual transition to bermudagrass, visual turf quality may be reduced until the bermudagrass has had sufficient time to recover. This is especially true if medium to heavy verticutting is implemented. Typically, patches of thin turf form and remain unsightly until the bermudagrass greens-up and fills in.

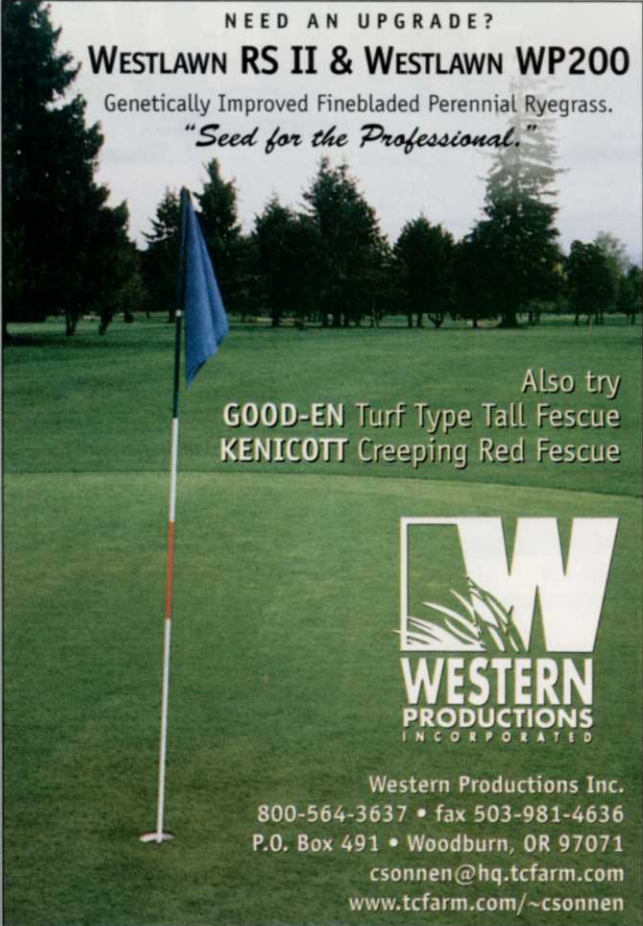
7) **Maintain adequate soil moisture.** Don't reduce or withhold water in an attempt to encourage the overseeded grass to die from moisture stress. Spring is when bermudagrass suffers from natural decline of older roots and initiation of new ones. Water deeply and infrequently to encourage deep bermudagrass rooting at the expense of the overseeded grass.

8) **Use of herbicides** or plant growth retardants. Selective herbicides have proven useful for slow removal of overseeded grasses in spring. This allows the superintendent better control on transition timing. Herbicide use also provides an earlier indication on how well the bermudagrass wintered and allows more time should re-sprigging or sodding be required. Removal of overseeded grass with herbicides


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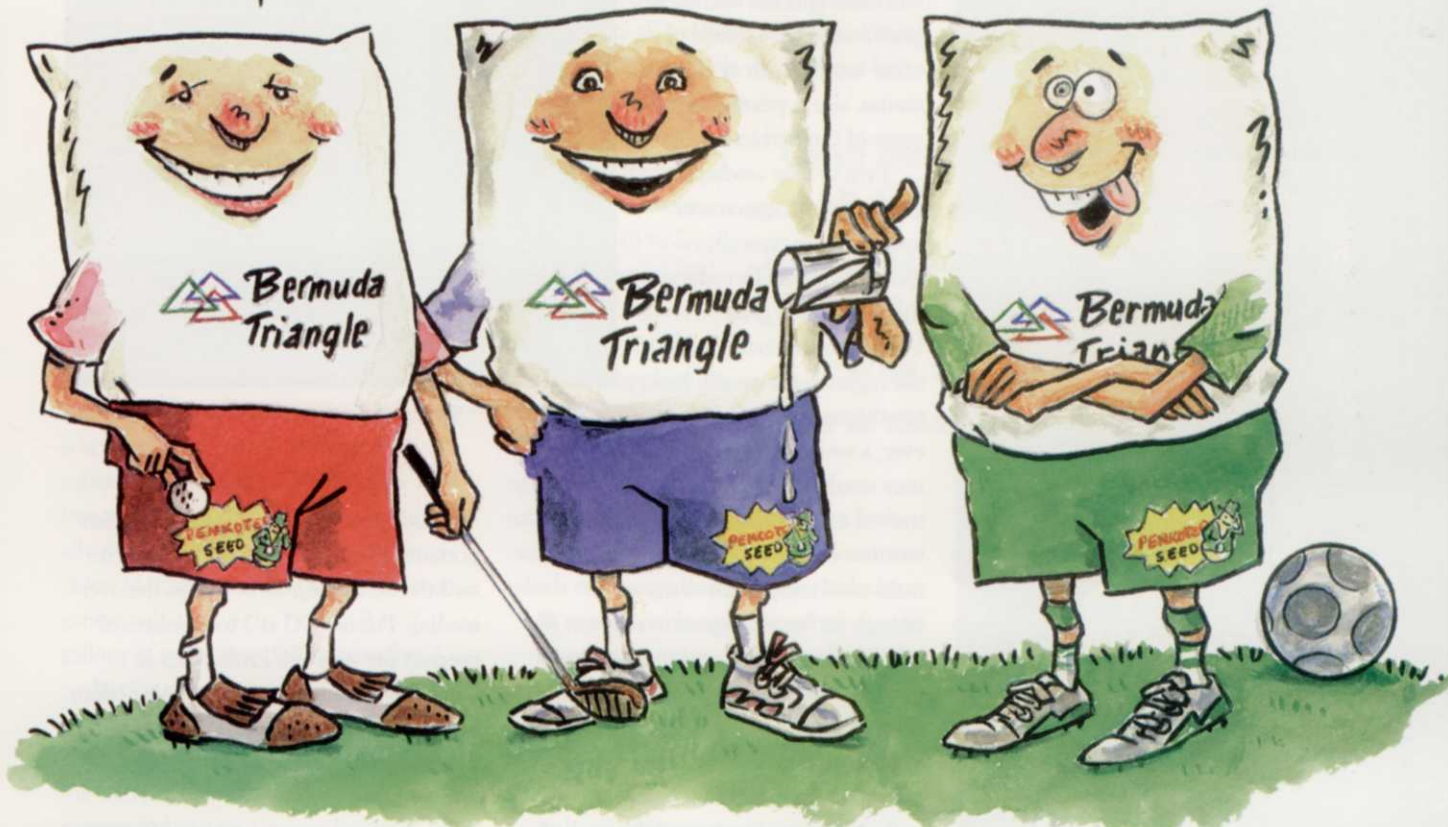
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GUIDE TO OVERSEEDING

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—Corey Sonnen, Western Productions

► "Our main overseeding products are Champion and Champion G. Q. perennial ryegrass blends. The supply is excellent."

—Stephanie Ward, Seed Research

► Tee time 12-30-7 with Siduron is a combination of the proper nutrients to use on newly-seeded turf or on established turf where overseeding and a pre-emergence herbicide is required. The high phosphorus content provides the nutrient most needed for seedling development and at the same time, will supply enough nitrogen and potash for initial plant growth. At the recommended rates, this product will control annual weed grasses such as crabgrass, foxtail and barnyardgrass into newly-seeded bluegrass, perennial ryegrass and fescue.

—Doug Masters, national sales manager, professional products for The Andersons

(Masters recommends you apply Tee

Time to turf in the spring, prior to expected annual weed grass seed germination. Apply 3.3 pounds per 1000 sq. ft. in newly-seeded areas as the last step before watering. For established turf, apply at 6.6 pounds per 1000 sq. ft. At least one-half inch of water must be provided within three days of treatment.)

► "Availability in 1998 is good! Recommendations for residential lawns: Double Eagle Supreme Blend. For fairways: Eagle Blend. For greens: Double Eagle Supreme Blend. For Florida greens: Pro Am Poa Trivialis Plus Princeville Max."

—Mark E. Laube, product manager, seed LESCO

will also remove the competitiveness and therefore will allow quicker bermudagrass recovery. Control of other weeds, such as *Poa annua*, also is possible with some of the herbicides.

Two to four weeks, depending on temperatures and rates, are typically required to gradually reduce the overseeded grass. Warmer temperatures and the higher rates usually hasten this conversion. However, a weak stand of grass may result if greens are

treated too soon in spring and if the weather remains cool. Thin turf will remain until temperatures are warm enough for bermudagrass to recover. Research indicates that mid to late-April treatments of Kerb 50W at one lb. product per acre provides the best timing and rate for transition. Visual injury to ryegrass with this treatment lasts from one to three weeks. Pendimethalin applied at five pounds (Pre-M 60DG) in early March also aids in transition but may not be consistent between years. Oryzalin or oryzalin plus benefin (e.g., XL) severely injures ryegrass while oxadiazon, metribuzin (e.g., Sencor) or MSMA doesn't affect transition.

Proceed with caution when using herbicides to enhance transition. Don't begin treatments until several weeks after bermudagrass resumes active growth. Lighter rates than listed may be wise if 'weaker' overseeded grasses such as *Poa trivialis* or fine fescue are present. Sprayer calibration and application uniformity are extremely critical and once the overseeded grass begins to die from the herbicide, there is no turning back.

Plant growth retardants have also been used to help make a smoother spring transition. Mefluidide (Embark 2S) and trinexapac-ethyl (Primo 1EC) have been used in early spring to help discourage the overseeding without retarding the



Clumping of undesirable ryegrass in early spring near golf greens.

bermudagrass green-up. Rates appear important since heavy applications may retard the bermudagrass as well as the overseeding. Primo 1EC at 3 to 4 ounces of product per acre and Embark 2S at 1 quart per acre are the starting point. More research should pinpoint rates in relation to timing of the transition.

Winter management

Maintaining an acceptable turf appearance during winter involves proper watering and fertilization, traffic and disease management. In addition, areas that become damaged or do not provide an acceptable stand after the initial seeding may need more seed. Order an extra 10 percent of seed in the event of thinning.

Irrigate regularly during the winter to prevent plant desiccation. Also, light, mid-day irrigations may be necessary if the overseeded grass begins to wilt. Don't over-water; this may promote algae and disease occurrence.

Traffic control in winter reduces injury to the bermudagrass crowns and stolons. Frequently alternate or change mowing patterns, regularly skip 'clean-up' laps, use walk-mowers, and change pin placement daily.

Nitrogen fertilizer influences the appearance of the overseeded grass and spring recovery of the bermudagrass. Avoid excessive nitrogen to prevent unhealthy grass competition and to prevent

succulent overseeding growth. Nitrogen applications every 2 to 3 weeks with ½-lb. nitrogen per 1000 square feet usually is sufficient. More frequent applications may be needed if the recovery time from traffic or damage from weather is slow.

Applications of phosphorus, potassium, manganese and iron should be considered during winter. All of these provide desirable color without stimulating excessive shoot growth. Also, potassium helps in carbohydrate formation. These elements also prevent grass desiccation. Determine soil phosphorus and potassium levels by soil testing. Iron generally is applied every 3 to 4 weeks as ferrous sulfate at 2 ounces per 1000 square feet. Iron sulfate or a chelated iron source usually can be tank-mixed with most fungicides. Manganese can be applied as manganese sulfate at ½- to 1-oz. in 3 to 5 gallons of water per 1000 square feet.

Its occurrence usually is suppressed with sufficient nitrogen levels. Brown patch and pythium blight generally are the exception and not the rule for today's overseeded grasses. Greens, however, which drain poorly or suffer continuous wet periods, can trigger outbreaks of these diseases. Excessive amounts of soluble nitrogen also can trigger disease. Turf managers should check the weather forecast regularly and be ready to use a fungicide if extended warm, moist (foggy) conditions are forecasted.

The overseeded grass and the non-dormant bermudagrass base grass can develop *Helminthosporium* leaf spot during the fall, winter, and spring months when temperatures slow grass growth. Leaf spot is similar to dollar spot in that maintaining adequate nitrogen levels usually keeps the grass growing aggressively enough to out-grow the disease symptoms. Fungicides, however, may be required during extended periods of cool weather which prevent adequate bermudagrass shoot growth.

Post-planting maintenance

Irrigation: Following seeding, irrigate lightly to carefully moisten the soil sur-

face without puddling or washing the seed into surrounding areas. Three to four light irrigations per day may be needed until all seedlings establish. Once germination begins, the seed can not be allowed to dry out or the stand will thin.

Disease management: After seedling emergence (5 to 7 days for ryegrass, 10 to 14 for bentgrass and for roughstalk bluegrass), apply a preventive fungicide to help protect against Pythium root

rot and *Rhizoctonia* brown patch, which can destroy overseeding stands. Factors which encourage these diseases include:

- ▶ unseasonably warm weather;
- ▶ using excessive seeding rates which produces young, succulent plants;
- ▶ prolonged periods of high, free moisture on leaf and stem surfaces, such as extended foggy conditions; and
- ▶ bermudagrass aggressiveness.

Proper timing and application rate of seeding, minimum use of nitrogen, efficient irrigation scheduling and the use of pre-treated fungicide seed are methods to reduce disease potential. To prevent development of resistant strains of *Pythium*, always follow the label and alternate be-

tween chemical groups.

Mowing: With ryegrass overseeding, mow greens at a 1/2-inch height when the new stand reaches 2/3- to 3/4-inches. Gradually lower the cutting height to

Once the overseeded grass becomes established, the chances of severe disease is reduced. Dollar spot usually develops when nitrogen levels are low or when Poa trivialis or bentgrass is used as an overseeded grass.

1/4- to 5/16-inch over a 2 to 3 week period at 1/32-inch increments and skip the 'clean-up' mowing lap the first few mowings to minimize traffic and wear on the tender seedlings. Continue this gradual reduction in height for 4 to 6 weeks until 3/16-inch height is reached. Tees and fairways usually are permanently mowed at 1/2-inch to 3/4-inch, respectively.

Fertilization: Do not fertilize with nitrogen during overseeding because this may encourage excessive bermudagrass competition. Adequate levels of phosphorus and potassium, however, should be maintained for good plant growth. Begin to fertilize shortly after significant shoot emergence (two to three weeks after



Thinning out of this golf green was caused because it was verticillated with ryegrass too early in the spring, on a hot day

Calibrate spreaders, define boundaries

Golf greens and tees

1) After completing the seedbed preparation steps mentioned earlier, a uniform application of seed is needed to provide a smooth and uniform playing surface. Seed should be applied when the surface is dry. Drying can be hastened by dragging a hose across the turf surface. Wind speed should be less than five miles per hour to minimize seed movement onto adjacent areas.

2) Spreaders should be carefully calibrated to deliver the appropriate amount of seed. Another method is to pre-weigh seed for a known area, such as a putting green, and carefully meter it out over the area. This usually requires numerous passes over the area to ensure uniform seed coverage and at least two directions should be used when broadcasting the seed.

3) Boundaries of the overseeded areas should be defined by using a drop spreader. The remaining seed is applied with a drop, or centrifugal, spreader within the outer fringe of the seeded area. Avoid seed spread to non-target areas such as collars, fringes, and other nearby turf areas. Unwanted seed will reduce aesthetic value and create the need for additional maintenance.

4) Clumps of ryegrass are most noticeable the spring following application and tend to remain visible into early summer. Control of these clumps, once they are established, is difficult and slow. When trying to reduce the amount of unwanted ryegrass drift, carpets and mats should be placed in the designated areas used to fill and empty spreaders. Mats also can be placed around the perimeter of seeding area to minimize escaped seed.

5) Worker's shoes and dragging equipment should be cleaned before and after entering the perimeter area surrounding the green.

If ryegrass drift is suspected outside the intended overseeded area, a premergence herbicide should be applied after

overseeding. A short boom or backpack sprayer should be used to treat areas not accessible by tractor-drawn or self-powered sprayers.

If non-fungicide treated bentgrass seed is used, a fungicide is needed for disease control. For best seed coverage, fungicides should be applied before the green is topdressed. Fresh seed also should be used as good seedling vigor is necessary for plants to quickly develop past the susceptible seedling stage. Proper seeding rates should also be adhered as higher rates should not be used since this could produce weak, succulent plants.

Once the seed have been applied, light topdressing of greens and tees at 1/3- to 1/2-cubic yards per 1000 square feet encourages desirable seed-to-soil contact and turf establishment. Seed and topdressing material is then incorporated by dragging a carpet across the seeded area. A steel mat may need to be placed on the carpet to provide sufficient weight. Topdressing should be dry before dragging to minimize seed pickup on shoes and equipment. A cover on the ground also should be used when entering and leaving overseeded areas to prevent unwanted seed movement.

Fairways

Following seedbed preparation, large areas such as fairways typically use a centrifugal spreader to disperse seed. As with golf greens, seed should be spread in at least two directions. Use a drop spreader for defining the perimeter of these areas. Fairways are seeded at 250 to 450 lbs per acre with perennial ryegrass, or 250 to 400 lbs per acre with annual ryegrass (See Table 4). Only fungicide-treated seed should be planted. Buying extra seed to repair worn or poorly established areas is suggested.

Fairway seed should be matted into the soil surface following overseeding. Topdressing usually is not used on these large areas after seeding except for intensive traffic areas such as approaches. Matting

of large areas can be achieved by dragging a rug or old carpet section over the seeded area. Another method to encourage good seed-soil contact is by operating a stiff-wire power sweeper in several directions over seeded areas. After dragging-in the seed, topdress lightly (e.g., 1/2- to 1-cubic yards per 1000 square feet) over heavy play or traffic areas with a soil mix similar to the underlying soil.

Another means of seeding fairways is through a slit applicator. Slit seeding helps overcome heavy thatch layering and generally provides good germination since the seed is in direct contact with the soil and is less susceptible to drought. Slit seeding however, requires a slit seeder, is slower to plant, can cause skips and gaps in the seeding pattern, and then have visible rows of seed until the ryegrass is mature enough to tiller.

Use of plant growth regulators (PGRs) as overseeding aids has become more popular. The PGR is applied just prior to overseeding to retard the bermudagrass growth, thus, reduce the competition between it and the newly overseeded grasses. Only foliar absorbed PGR materials should be used since root absorbed PGRs can retard the germination and growth of the overseeded grasses. Trinexapac-ethyl (Primo 1EC) applied at 8 to 16 oz/acre 2 to 5 days prior to overseeding has worked well if the bermudagrass is still actively growing with little or no effect on overseeded ryegrass. If the area to be overseeded is cultivated by verticutting prior to seeding, the advantages of using PGRs are greatly diminished.

Overseeding cool-season areas

The procedures of overseeding cool-season areas are similar to the warm-season areas, except for timing. Cool-season areas can be overseeded at different times of the year, but generally are seeded in late summer (best time) or early spring (second best time). Dormant seeding is sometimes used successfully in Northern areas when the seed is applied during late

GUIDE TO OVERSEEDING



fall or winter when temperatures prevent germination. In spring, when thawing soils are often saturated and very difficult to get heavy machinery into, the earlier seeding allows germination and establishment. Winter weather for dormant seeding should cooperate in that temperatures stay consistently cold during winter to prevent premature germination and subsequent kill by a late cold snap. The areas should also remain under snow cover to maintain steady soil moisture with little rain to move seed. One note when using dormant seeding, seed mortality is high, requiring up to 50 percent higher seeding rates above normal.

When slit-seeding or slicing, the sliced grooves should be at least 1/4-inch deep to provide this desired contact and the surface not just scratched. Several passes help ensure good coverage and less noticeable slits.

Generally, the turfgrass species chosen should match closely to that which is currently present unless a change in grass is desired or extensive turf damage has occurred. A Kentucky bluegrass fairway, for example, is generally overseeded with 100 percent bluegrass at a rate of 2 to 3 lbs/1000 sq.ft. If extensive damage or exposed areas exist (25 to 50 percent bare soil), a mixture of 2 lbs bluegrass plus 5 lbs perennial ryegrass per 1000 sq.ft. may be necessary for rapid cover. Pure perennial ryegrass areas are generally overseeded with ryegrass only.

seeding for perennial ryegrass) and continue until cold weather halts bermudagrass growth. Normally, 1/4-lb. to 1/2-lb. nitrogen per 1000 square feet every 2 to 3 weeks with a soluble nitrogen source (e.g., ammonium nitrate/sulfate), or 1-lb. per 1000 square feet per month with a slow release nitrogen source (e.g., IBDU, milorganite, SCU), is adequate to promote de-

Desirable striping of perennial ryegrass by alternating mowing directions.

sired growth without overstimulating growth and encouraging disease. **LM**

Guide cover photo of Bay Hill Country Club courtesy of Lofts Seed.

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Photo of 70% Cypress Poa trivialis and 30% Trueline Creeping Bentgrass Green courtesy of Banyan Golf Club in Palm Beach, FL. Dan Jones, CGCS Golf Course Manager.



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Golf is my hobby and my profession. Many of us became superintendents because we like to play golf and we enjoy interacting with golfers. I think it's beneficial for a superintendent to build his/her golf skills. I think it can make a capable superintendent even better.

All of us make decisions day in and day out to improve golf turf. We work hard to provide the best playing surface that we can for the golfers that play on our courses. We make most of our decisions for agronomic reasons. We know that good turf is part of a good course.

But turf, as vital as it is, is still only part of this great game.

We superintendents need to align ourselves a bit closer to the game itself to become more effective in our profession. We need to look at some of our decisions from a golfer's viewpoint.

Here are some suggestions to improve your golf skills:

- ▶ If you're involved with a local or regional superintendents association, make it a point to play at the chapter meetings

when they have golf outings.

- ▶ Maintain a regular handicap, and try to play in some tournaments. That will give you a better understanding of how bad lies or badly raked bunkers can affect your game.

- ▶ Get involved in local tournaments or high school golf matches as a volunteer or an official.

- ▶ Join your local golf association.

- ▶ Learn the rules of the game (particularly how to mark the course) and keep abreast of any changes.

- ▶ Have a working knowledge about the latest golf equipment. It will help you relate to members.

- ▶ Work with the professional at your club. You might improve relations with the pro, and your swing should get better too.

Better golf skills make better supers?



KEVIN DOWNING
Willoughby GC,
Stuart, Fla.
Guest Columnist

[GOLF]

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Summertime is tourney time!

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Reduce water, control algae

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Overseeding: make or break time

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A different kind of overseeding

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It ain't about green speed

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LM 's Guide to Overseeding

Not everybody is a low handicapper, but if you work on your game you will improve. For some reason, members seem to think that because you can break 80, all of a sudden you know a heck of lot more about golf turf.

But the best reason to play is also the most obvious: It's a game of long-lasting fulfillment. **LM**

[SUPERS ON COURSE]

Supers win at golf show

Howard Pillsbury, superintendent at Northridge Hills, Jacksonville, IL, and **Mike O'Conner**, Raymore, MO, were the lucky recipients of autographed Arnold Palmer Titanium Drivers at the GCSAA Trade Show. **Dr. Richard Hurley**, executive vp of Lofts Seed, drew their names at the Lofts Seed booth.

Upgrade at Great Oaks

John Nowakowski, CGCS, Great Oaks CC, Rochester, MI, has expanded his maintenance department to include wash pads, a recycling center and overall better working conditions. He advises others to plan ahead for such additions.



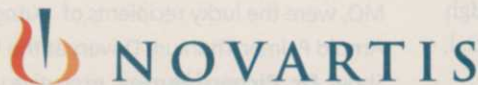
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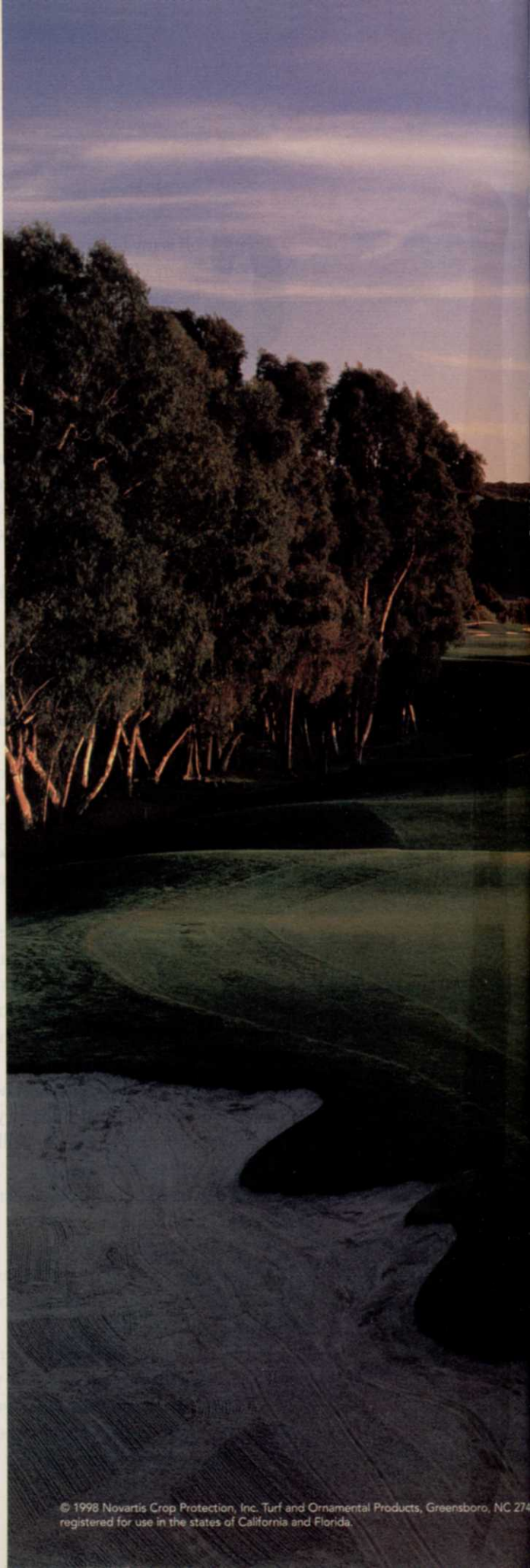
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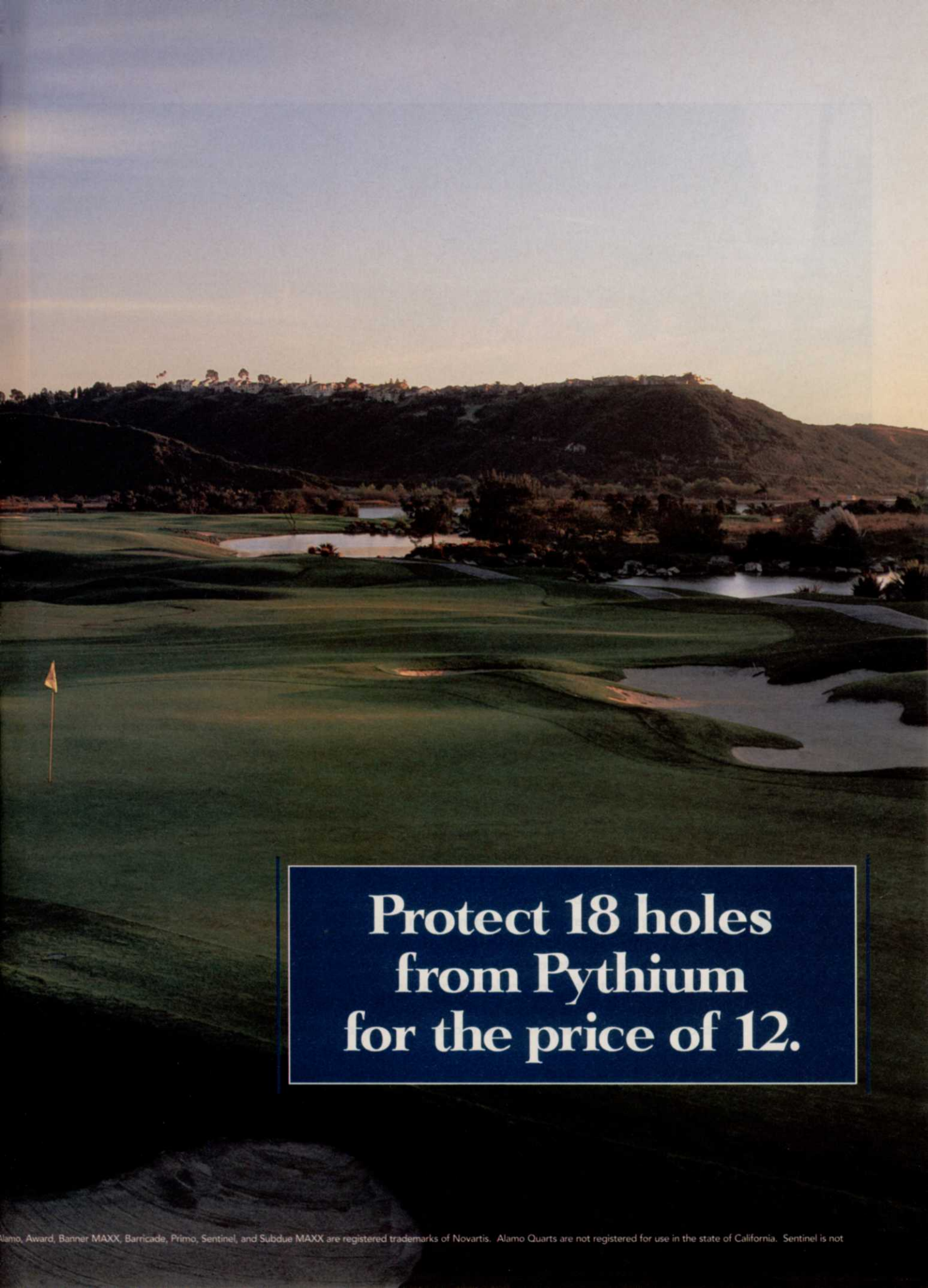


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It's tourney time!

Tournament-tested superintendents share their experiences so that your big event showcases both your club and your value as a superintendent.

By RON HALL/ Managing Editor

Canterbury Golf Club, Beachwood, Ohio, hosted the 1996 U.S. Senior Open. Not every golf course has Canterbury's heritage. But, just about every golf course hosts a tournament. As your big tournament approaches (maybe even a club or city championship) read on to garner tips to put your course at its best.

Starting with veteran superintendent Terry Bonar, CGCS, at Canterbury, several experienced superintendents offer suggestions to help you prepare for your special event.

Hosting a nationally televised tournament is a big honor, both for the club and its superintendent. It directs a spotlight on the club and course. The superintendent gets a chance to display the course at its best.

But, your tournament doesn't have to be televised to be important. In fact, *every* tournament is important to the participating golfers. And, the superintendent is

called upon to do something special with the golf course at just about *every* tournament.

Canterbury management actually began considering a major tournament almost 10 years before it actually hosted the '96 Senior Open. In 1988 the Club asked Stanley Zontek of the USGA Green Section to visit the course with an eye to hosting a major event. Zontek visited the Club annually and made many helpful suggestions to make the course more tournament ready, as did Bob Brame, his successor in the USGA Green Section, recalls Bonar.

A big help

"The turf advisory service really helped us in preparing for the Senior Open," says Bonar. "And, it's a credit to Canterbury's membership that it followed through with these improvements."

A club applies for a major USGA tournament years prior to the event. This "invitation" is scrutinized by a special USGA committee. It considers factors like layout and condition of the golf course, its proximity to a metropolitan area, whether the club has the room and facilities to handle so many people and vehicles, willingness of the club's membership and availability of volunteers, and practice areas.

Actual tournament preparations begin almost two years ahead of time—in Canterbury's case in the fall of

1994. That's when David Eger (he is now with the PGA in a similar capacity) and Mike Davis of the USGA played the course with Bonar and Skip Vogelsberger, vice chairman of the championship for the Club. In resulting discussions it was suggested that Canterbury enlarge four tees and widen two fairways.

The Club made the tees larger that same fall. It also put in three target greens and replaced the bridges on the course. The USGA didn't require these improvements, but the membership had been considering them, and thought it was a good time to do them, says Bonar.

Improvements continue

Tim Moraghan, USGA championship agronomist, visited the course during the 1995 season. He checked on the tee work, and suggested that the



Terry Bonar sought advice of other supers.

Club level the landing areas—for instance, locations where settling had occurred along tile lines or irrigation trenches. Bonar assigned a crew to do that in the fall of 1995.

Meanwhile, the Club also continued its two-year tree trimming program. Canterbury places a high value on its trees, and Bonar has an arborist on his staff. But the trees got special attention anyway.

"We examined every tree and we trimmed it up to eight feet," says Bonar. "We tried to look at things from a liability as well as a playability standpoint."

While Bonar is no novice in preparing a course for a tournament (Canterbury has hosted PGA events) he, in company of committee members and other club officials visited and gathered suggestions from superintendents at other sites familiar with major tournaments. These included Mark Kuhns at Oakmont Country Club (1994 U.S. Open), Pine Hurst's Brad Kocher and assistant Bob Farren, host of the 1994 U. S. Senior Open, and Paul Latshaw, Sr., Congressional Country Club, (1995 Senior Open, '97 U.S. Open). Tom Walker at In-

verness Club, Toledo, Ohio, and other superintendents willingly shared their tournament experiences too.

With so much preparation and so much experience how could anything go wrong? Somehow, something always seems to pop up to challenge the superintendent.

Problems to solve

In Canterbury's case, an application of ammonium sulfate fertilizer the December before the tournament created ugly small spots of dead grass on several greens. "To this day we don't know exactly what happened. It wasn't a good thing to see," remembers Bonar. Putting a cover over the greens early that spring to protect the turf and promote growth helped heal the damage.

Then, as the tournament got nearer, a greens mower sprang a hydraulic leak and Bonar and his crew were forced to resod a section of a green. And, finally, two weeks before the tournament the turf on the rebuilt 7th tee died. "Up until two weeks before the event it looked great," says Bonar. The Senior Open didn't use that portion of the tee, and Bonar has since solved that problem with the fungicide Heritage.

One crucial decision Bonar made—and one that turned out well—was his decision to limit the volunteers he would use once the tournament began.

"I really didn't have a lot of volunteers," says Bonar. "We decided to use the staffing we had used for our Senior PGA Tour events. We ended up with 29 people and two volunteers."

During tournament week, Bonar and his maintenance staff arrived at the course 5 a.m. daily and briefly discussed the day's plan. By 5:30 a.m., when the sun peeked over the horizon, they were on the course. By 9 a.m. each day the greens had been double cut. The crew had also cut the fairways, collars and intermediate rough. Terry's crew had changed the hole locations and hand-raked the bunkers. The



James Baran, CGCS, increases the height of cut on his roughs and no longer uses a gang mower. He now uses the Articulator mower.

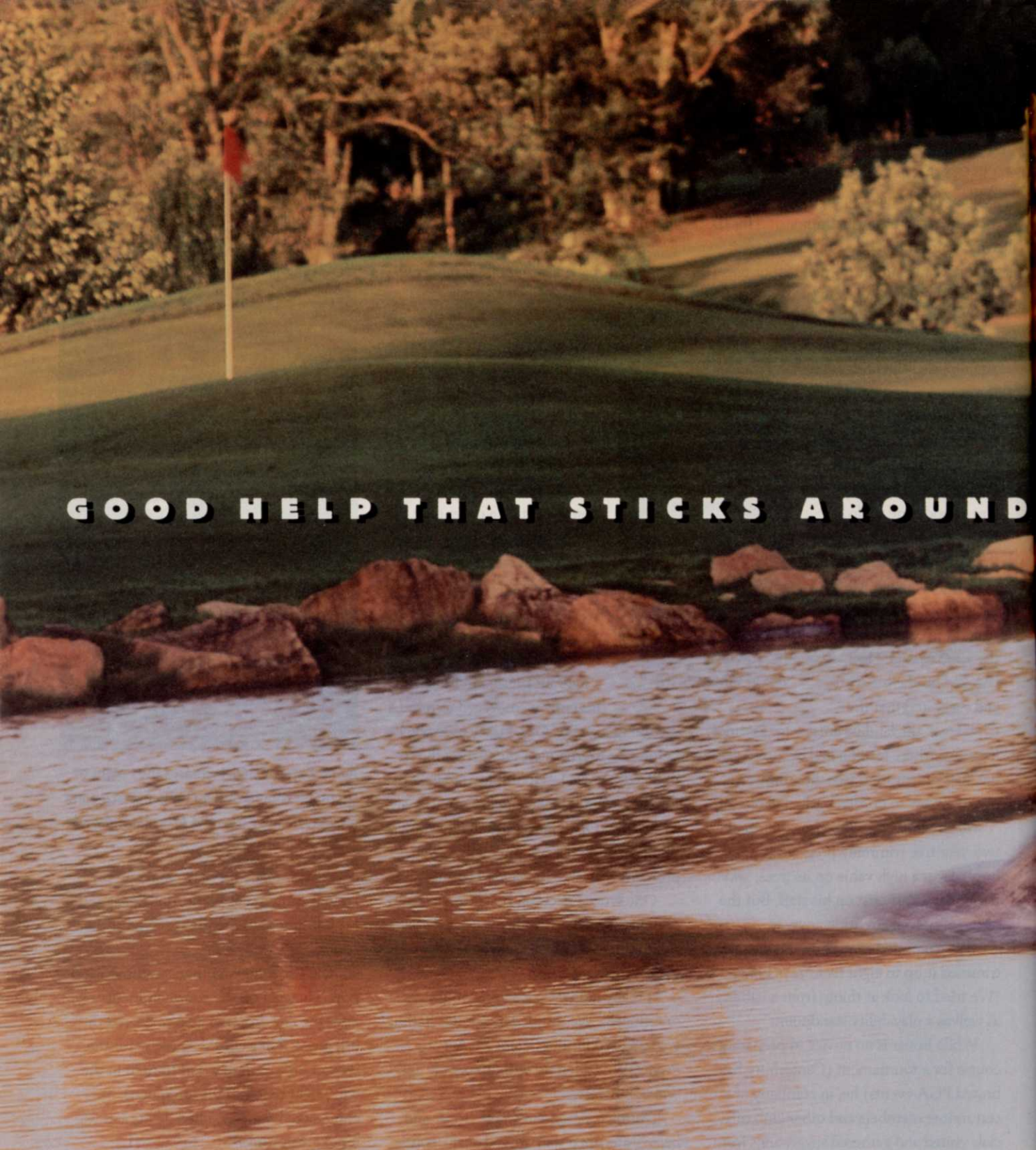
course was ready for play. Some of the crew was then sent home, but Bonar and his full-time staff members stayed at the course.

The extra crew members returned at 5 p.m. They got on the course immediately after the first group of golfers cleared the 9th green. They cut the fairways for the second time each day (left to right in the a.m., right to left in the afternoon), machine-raked bunkers, filled divots and watered green banks.

Good weather a plus

Bonar says that both the time of year, early July, and the weather, dry for the most part, smiled on his course for the Senior Open. He had kept the greens dry. By the third day, he was asked to water some of them to soften them a bit.

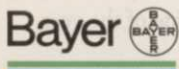
"The event was at a time of the year,



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the 4th of July, right before stress (turf) and we could do some things to the golf course that we couldn't have done later," says Bonar. "By that time the staff was pretty well trained too. It was a great time of the year."

If you don't have several years to prepare for your big event (and who does?) consider some of these "tricks of the trade" that other superintendents employ.

Everett Holzapfel, III, Jackson Country Club, Jackson, TN, likes to make a fungicide application with a little more iron to the greens a few days prior to the event. He feels wants a little extra protection against disease, and a little more color in

'Overhead' precautions

Whether or not a golf course has an arborist on staff, the condition of trees has the potential to add to or detract from the overall appearance of the course. Dead branches, stressed or declining trees, loss of leaves through anthracnose or chewing pests are only a couple of potential problems.

An additional concern is the potential for liability. Dead limbs, trees with cavities and/or decay are all potential hazards not only for golfers but for the increased traffic and the number of observers who will be standing underneath those trees.

Not only should the trees be inspected for appearance but also for potential risk of hazard. The timing of the failure of a tree cannot be predicted but the potential for failure can be identified and addressed. Pruning, removal or control of traffic around a concern can be considered.

Hiring a consultant who is a certified arborist with experience in hazard tree assessment is a valid and responsible step not only in preparing for tournaments but also as a part of routine course maintenance.

—Nancy Stairs

the turf.

Consider using Primo

He also schedules a fertilizer application for the fairways and tees a couple of weeks prior to the club championship. The week prior to the tournament he will apply Primo (again with a little extra iron for color) to protect himself from inclement weather.

"Two years ago, while hosting a state amateur event I did just that. Right after the first round was over we had a two-inch rain," says Holzapfel. "We could not mow fairways until the last day of the tournament and when we did it was as if we had not missed a day."

In addition to giving more attention to blowing all debris off the course—aprons, fairways and the rough—his crew also spends more time on bunker preparation. They will edge and Flymo all the bunkers the week before and continue to Flymo them daily in the evening after the last group. They hand-rake bunkers daily during an event too.

"Lastly, mowing heights are usually not compromised depending on the time of year," he says. "We manipulate speed in other ways by double cutting and rolling the greens daily."

Some special touches

James Baran, CGCS, superintendent at Eagle Creek, Norwalk, Ohio, says his Penneagle/Pennlinks fairways, mowed at 1/2-inch, are pretty much tournament ready throughout the season. But he does give special considerations to greens, bunkers and roughs, particularly for tournaments involving golfers with low handicaps.



Everett Holzapfel, III, says Primo can help prior to a tournament.

"About four days before a tournament we will topdress the greens pretty heavily, brush them and double-cut them. Then the day before the tournament we will brush and double-cut them," says Baran. "We can take them up to 10 1/2 or 11 pretty quick. We don't even have to change the height of cut."

Usually also, Baran will raise the height of cut in the roughs. "We've gotten away from using the gang mowers and we're using a pull-behind rotary mower, the Articulator. It has seven decks, and we can take it right over the mounds and never scalp."

Baran's crew may also fluff up the sand in the traps a little more than normal too, particularly if the golfers in the tournament are supposed to be really good golfers. "Normally we keep the sand on the firmer side," he says.

And finally, but equally important, don't forget marking the course properly.

"Marking the golf course for rules and regulation interpretation is based on condi-

"I really didn't have a lot of volunteers. We decided to use the staffing we had used for our Senior PGA Tour events. We ended up with 29 people and two volunteers" --Bonar.

tion and accuracy of hazard, lateral and out-of-bound stakes," writes Rich Marshall in the Georgia *Through the Green* publication.

"On a consistent basis, all staking should be kept in good condition with periodic fresh coats of paint to maintain maximum visibility. Staking that is set in sleeves allows constant maintenance in correct position.

"Monthly applications of growth retardant to creek banks and lake banks residing along play areas of the golf course can minimize hourly labor to keep these areas mowed," adds Marshall, superintendent of The Orchard Golf and Country Club, Cornelia, GA. □

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Reduce moisture to control algae on greens

Dr. Houston Couch outlines simple program to prevent and cure that slimy, crusty algae problem on greens.

By RON HALL/ Managing Editor

Algae are a slimy mess when flourishing on a putting green. When they dry they form an unsightly black crust. The crust can be so thick that it seals soil pores. Aesthetics aside, this crust can prevent the regrowth of grass plants. That's why it must be mechanically broken up or sliced to improve the green's health.

Although algae are believed to be present in or on most soils they only "blossom" when there's enough moisture and light. Prolonged surface wetness is the biggest factor in the development and spread of algae.

The algae most likely to discolor a putting green are varieties of blue-green algae. They are not, strictly speaking, plants but they do require light for photosynthesis.

Algae on the move

Dr. Houston Couch, a researcher on turfgrass pathology at Virginia Tech, says algae—at least the varieties most often found on putting greens—move. They wait until the evening to begin moving up the leaves to the turfgrass leaf tips. Then, just as the sun comes up, they move back down the leaves. Even though the algae require light, they avoid the day's brightest sunlight by retreating beneath the turfgrass leaves, says Couch.

One reason algae are most apparent on putting greens, and become such a problem, is because the turf is cut at such a low height.

"If you've got an alga, even one as slow as an *Oscillatoria* that moves at 1/4 inch an hour, and you're mowing the greens at 1/8 of an inch or 1/10 of an inch, how long will it take it to get to the tip of the leaf where it (alga) produces its metabolites that are absorbed through the cut tips?" says Couch, who spoke at the Ohio Turfgrass Conference this past December.

Cultural control keys

The solution to the algae problem is to reduce surface moisture on these problem greens, says Dr. Monica Elliott, a researcher at the U. of Florida's Fort Lauderdale Research and Education Center.

Elliott suggests strategies such as:

- ▶ removing or thinning trees adjacent to the greens,
- ▶ reducing irrigation in problem areas,
- ▶ sand topdressing frequently (heavy enough to cover the algae),
- ▶ raising the mowing height to relieve stress on the turfgrass and also to allow the turf to shade out the algae.

There are several chemicals that can prevent or control algae too. The use of these products may be more practical on some greens and under some conditions, say Elliott and Couch.

Elliott's research has demonstrated that the active ingredients of mancozeb and chlorothalonil were effective when used preventively, either prior to conducive weather patterns or shortly after they begin.

Fungicides are effective

Drawing from work he's done, and also from studies by Dr. Elliott in Florida and Dr. Phil Colbaugh in Texas, Couch suggests that superintendents can prevent

algae before it becomes a more serious problem with two applications of 6 ounces of Daconil (chlorothalonil) per 1,000 sq. ft. on a 14-day schedule.

To cure an existing algal problem, he recommends two applications of 9 ounces of Daconil per 1,000 sq. ft. on a 7-day schedule, then three applications at 6 ounces on a 7-day schedule.

Another useful tool against algae on greens is the soil amendment Profile since it reduces surface moisture, says Couch, who suggests 50 to 100 lbs. (100 is better) per 1,000 sq. feet on a three-week schedule, followed by applications of Daconil or Fore.



Blue-green algae, the type most commonly plaguing golf course greens, are unsightly and harmful to turfgrass.

"When you go into an algae control program with either Daconil or Fore (a.i. mancozeb), don't expect to see anything great out of it for at least two weeks, most likely three," says Couch. "It takes a while to get a handle on it." □



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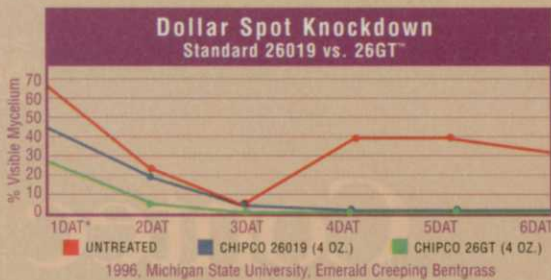
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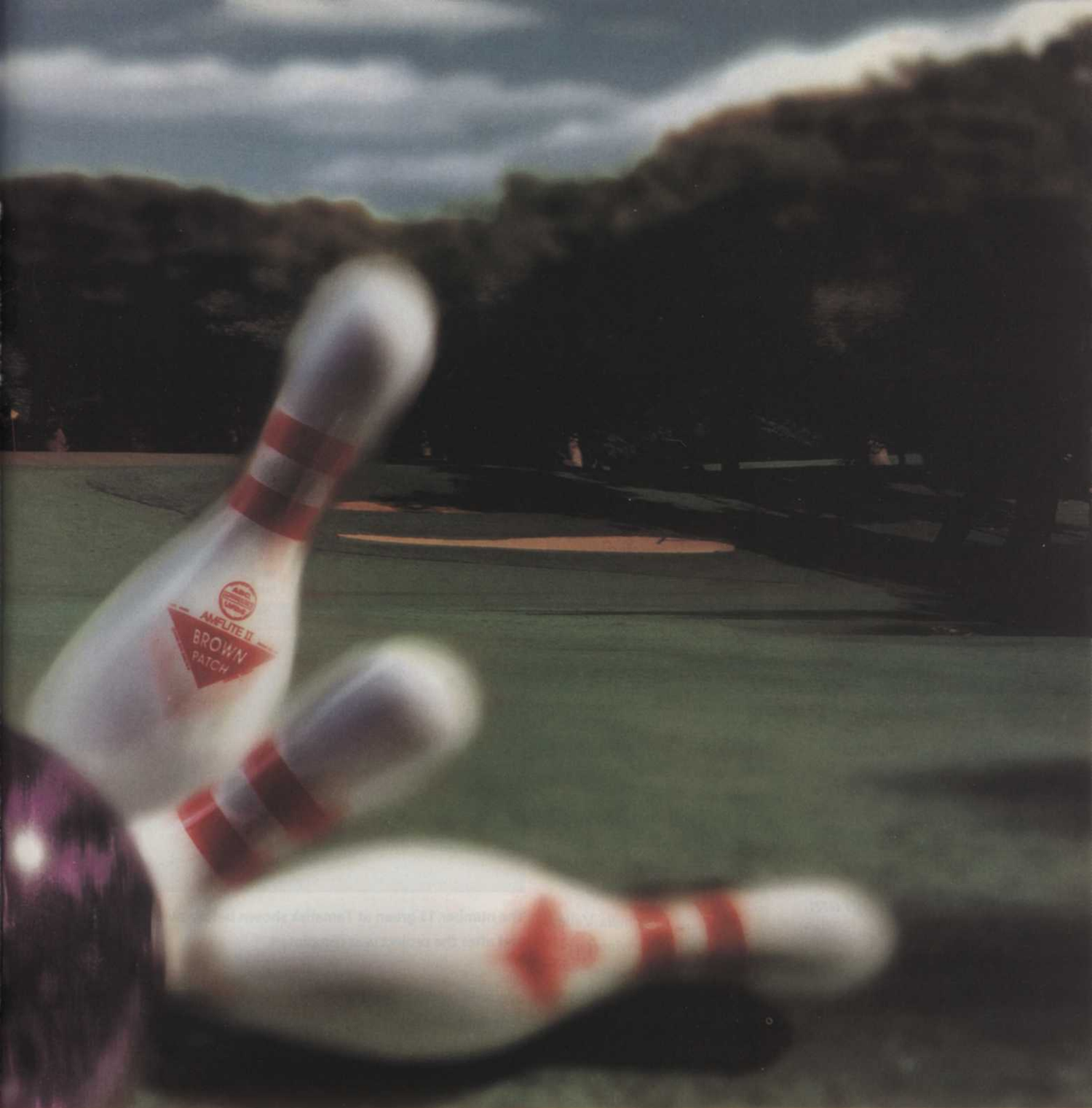
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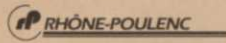
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Overseeding: MAKE OR BREAK TIME

Golfers's demands for denser turf drive Richard Sall to continually improve his overseeding program at Tamarisk CC near Palm Springs

By RON HALL/
Managing Editor

Golfers following the sun to California's Coachella Valley each winter expect to play on green turf. But Bermudagrass fairways go dormant brown each fall.

One of Richard Sall's responsibilities as superintendent at Tamarisk Country Club, Rancho Mirage, is to provide members and guests with verdant green playing conditions.

He does this, of course, by overseeding ryegrass into his Bermudagrass each fall.

This is a common practice on courses throughout the Sun-belt. But Sall, in his 12 years at Rancho Mirage, has developed some unique wrinkles in his



The number 13 green at Tamarisk shown before overseeding (inset) and after the project was completed.

overseeding program that other superintendents are starting to pick up on.

How important is overseeding on a course like Tamarisk?

"These are the days that can make or break my year," says Sall. For this reason, since 1992 he's been carefully graphing the high and low temperatures for the first 20 days of October.

"The night temperature has the greatest effect on bermudagrass growth," he explains.

"When the temperature drops below 60° F. growth slows dramatically. That usually occurs

in mid October in the Coachella Valley." Even with daytime temperatures nearing 90° F., it's the evening temperatures that slow and, finally, stop the growth of Bermudagrass, between October 12-16 in recent years. This has been somewhat later than he used to overseed; it's worked better.

"By moving back the seeding date by one week, competition from Bermudagrass is reduced, less water is required to keep the seed bed moist and there's less risk of disease to germinating seedlings," says Sall.

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Much of what Sall does is routine. He reduces irrigation prior to renovating to dry out the bermuda and make it easier to scalp. Sall believes it's better to water to keep the turf from drying out, and reduce water gradually.

Another option : a desiccant like diquat (Reward) to reduce Bermuda competition. After some experimenting on several trial plots he now uses one quart per acre combined with one pint of spreader-sticker (a.k.a. spray adjuvant) applied to dry turf.

"It dries out the Bermuda and makes it easier to renovate," says Sall. "It cuts down on the amount of debris."

It's important to renovate thoroughly all areas that are sprayed, Sall advises. Diquat can affect seedlings, otherwise.

Renovation, starting with scalping the Bermuda, is difficult even for powerful diesel mowers. "This has to shorten the life of a very expensive machine," says Sall. Instead, he's been using what he half-jokingly refers to as "the perfect renovating machine", a specially prepared flail mower (see sidebar).

Here, with some adjustments from season to season, is Sall's overseeding process:

► Let the fairway grow to one inch. It takes two to three weeks in Palm Springs to get from $\frac{7}{16}$ ths (summer height) to one inch.

► Spray either Primo growth regulator or diquat, or do nothing, based on the weather and when you want to seed.

► Set height on the flail mower. Sall sets it at $\frac{1}{4}$ -inch.

► Find the right speed for the flail. Don't go too fast. Make one pass over fairways. Sweep up debris and haul it away. Sall composts 25 percent of the clippings. Nothing is better to mix with wet ryegrass than dry Bermuda thatch. (The ryegrass dries and doesn't have an odor when mowing.)

► There will be a little green Bermudagrass left. Take the shields off the triplex mowers and go over the fairways the day before seeding. Set the mowers at $\frac{1}{4}$ -inch using grooved rollers, and make one pass on all fairways. It takes two operators about 30-40 minutes per fairway.

► Before seeding, pre-water the areas that have been renovated because the ground is so dry now. Seed will remain in place and will not move with water flow.



Before (above) and after the renovation. Diquat reduces Bermudagrass competition, says Richard Sall.



A perfect renovation will show very little bermudagrass remaining.

► Calibrate the amount of ryegrass you'll use by marking off a one-inch square on a piece of paper and coating it with a glue stick. Lay it on the fairway and drive over it with a seeder. Thirty-eight seeds in the one-inch square represents a seeding rate of 800 lbs. of seed per acre. A rate 400 lbs. to the acre, of course, means 18-19 seeds. (Remember wall-to-wall cart paths represent about 3 acres of concrete.)

► Irrigate. Sall uses a drum of wetting agent in his irrigation.

► After the seed germinates, fertilize it. Sall will inject 8-8-8

fertilizer, the maximum they can put in solution.

"I find the 8-8-8 helps the new rye seedlings get established because it's more like a foliar spray," says Sall, "and it decreases competition from the bermuda."

Regardless of the different techniques that superintendents use to overseed their courses, the results are almost always better when the decision on when to seed is made by the superintendent on the course, rather than in a boardroom, believes Sall. □

A 'renovating' machine

Mike Kocour, at nearby The Springs Club in Palm Springs, made a "renovating machine" by having a 5-inch-diameter roller fabricated and mounted to the front of a flail mower. By adding the roller and disconnecting the top bar of the 3-point hitch, the unit is able to float over the top of the ground. You can set the height of cut without scalping the high spots, says Sall.

Since using that first 88-inch unit behind a 90-hp tractor at Tamarisk, Superintendent Richard Sall has had a 60-inch unit made for his course. It has better articulation and can be pulled with a smaller tractor.

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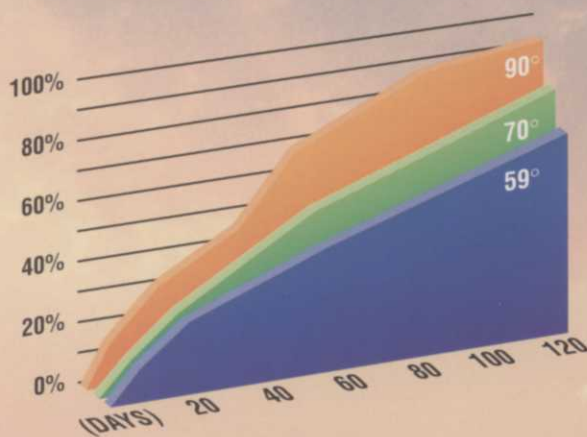
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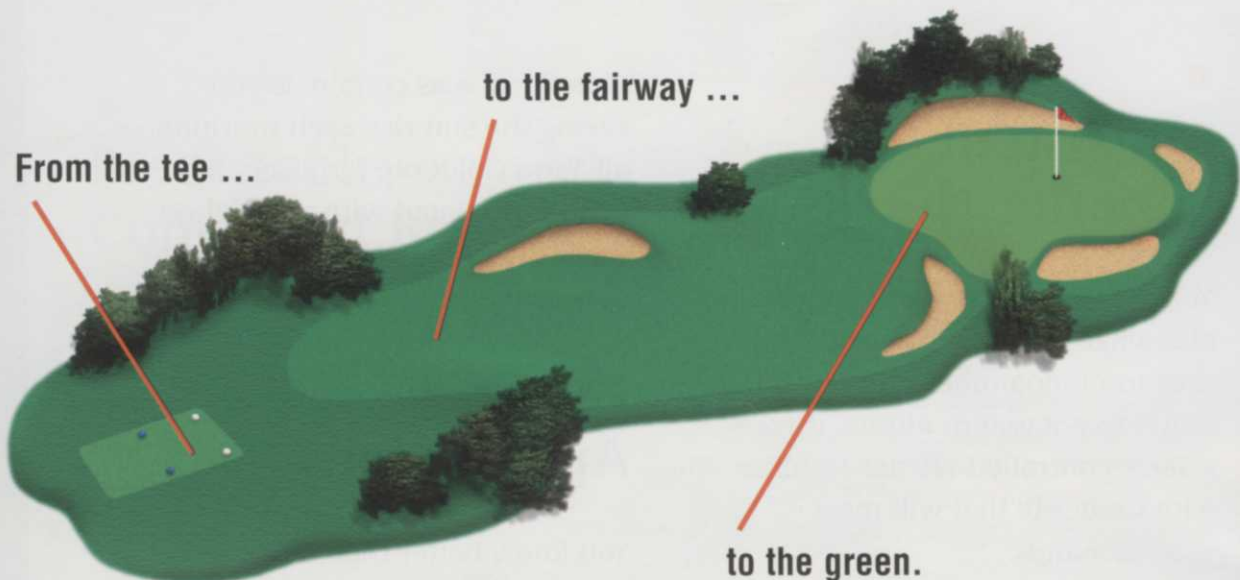
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A different kind of **OVERSEEDING**

In this turfgrass 'role reversal' Doug Rudolph and Randy Mueller of Pauma Valley Country Club overseeded improved turf-type bermudagrass into established perennial ryegrass.



By BRENDA DOSSEY & RUSS NICHOLSON, CPAg

The term overseeding is usually associated with the fall overseeding of perennial ryegrass into bermudagrass for "year-round" green color. When the bermudagrass goes dormant in the winter, perennial ryegrass provides an attractive appearance that entices golfers to head to the Sun Belt.

When winter is over and spring is headed into summer, the ryegrass gives way and the bermudagrass comes back green for the summer. This period, when the perennial ryegrass fades into the background and the bermudagrass comes back into play is known as "transition".

What if summer is coming, you have perennial ryegrass and there is no bermudagrass beneath to transition to? What if

time ran out and you did not have enough summer left last season to establish bermudagrass? Perennial ryegrass was your only option last fall. What do you do now?

Or perhaps the existing bermudagrass is not something you particularly want to transition to. It may be old and in need of replacement. Is there a way to improve it?

Transition or no, summer, in even the temperate areas of the semi-tropical climate zones, can be quite hot and dry. This can be challenging to even the most enduring of perennial ryegrass varieties. In contrast, bermudagrass has a highly developed system of above-ground stems and runners called stolons and below-ground stems called rhizomes with a very deep root system. Most agronomists and turfgrass managers recommend a bermudagrass base for withstanding heat and drought conditions and enduring the wear

and tear of high-use conditions found on golf courses, driving ranges, sports fields and premium home lawns.

So, how do you establish a bermudagrass base in a stand of perennial ryegrass and keep interruption of play and loss of turf usage to a minimum?

Doug Rudolph, superintendent of Pauma Valley Country Club, Pauma Valley, CA, along with his assistant, Randy Mueller, feels like he has devised a plan of overseeding improved turf-type bermudagrass into established perennial ryegrass that is truly a "win/win" situation. You may be relieved to know that there is a relatively easy method that keeps disruption of play and

Close up of the seeded area.

limitation of turfgrass use to a minimum. Here is their story.

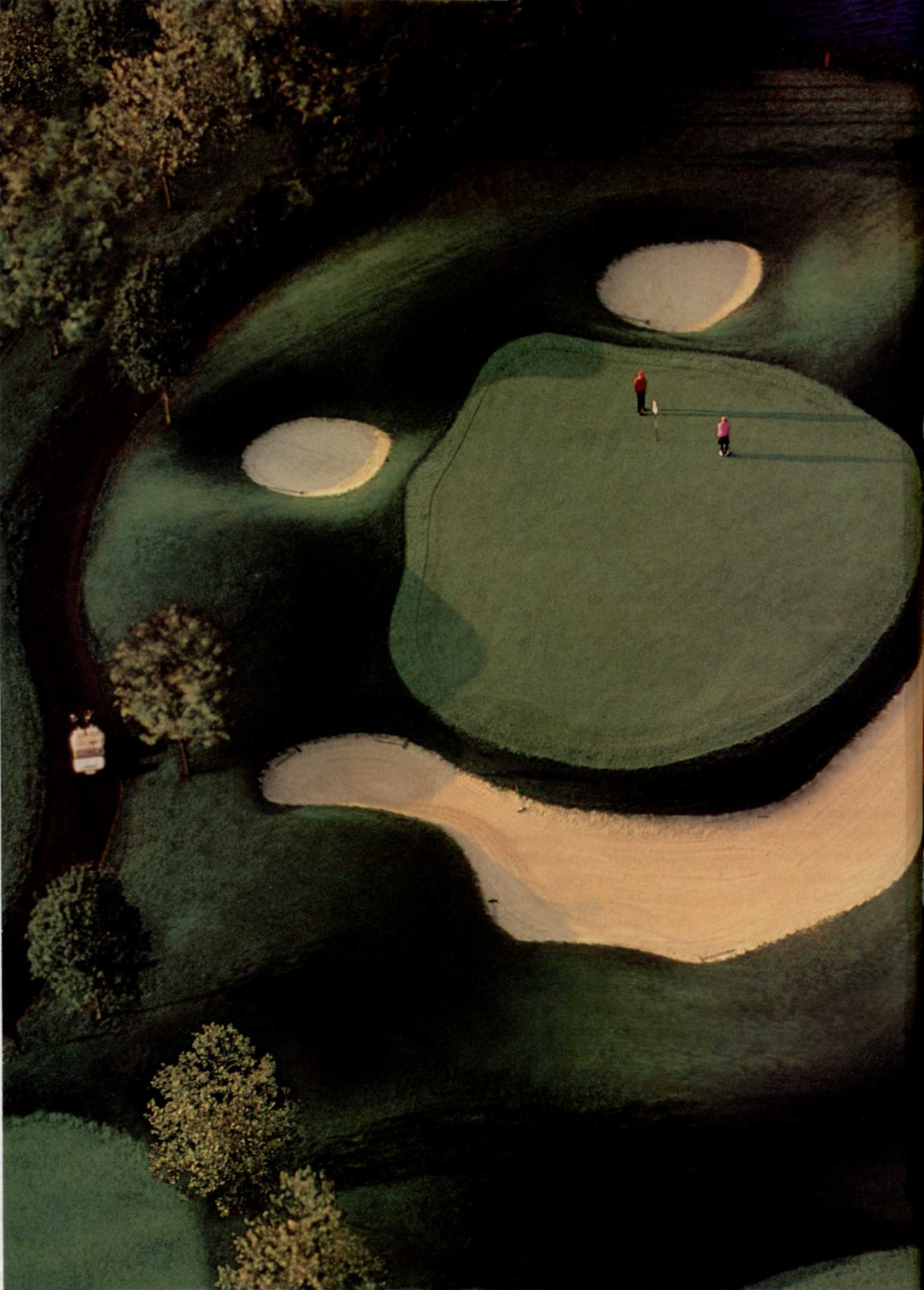
Time to renovate

Barely visible from the hus-



Superintendent Doug Rudolph, right, checks on calibration of the planter.


tle and bustle of Interstate 15, Pauma Valley Country Club is tucked in the northern part of San Diego County where groves of avocado trees grace the surrounding hills. The



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Aerification and verticutting on the fairway.

course was designed by Robert Trent Jones, Sr., and built in the early 1960s. The fairways are a mixture of perennial ryegrass and common bermudagrass. It was decided that it

was time to renovate the fairways. In early June 1996, Rudolph and his crew began their bermudagrass overseeding project. Fairways 10 through 18 were selected for

initial renovation.

1) They applied Primo growth regulator at label rates to retard competitive growth from the existing grasses.

2) Then the turf was aerified and verticut prior to seeding. Verticutting is done twice in different directions to open the turf and allow for seed-to-soil contact.

3) After the aerification and verticutting was complete, the debris and thatch were removed from the fairways. Debris and thatch were removed with a straight vacuum and a Goosen Rake A Vac. At this point, there was little green turf left in the fairways.

4) Certified Yuma bermudagrass was planted at a rate of 3 pounds per 1000 square feet on the country club. A billion-type seeder was used to plant the Yuma on the fairways. Care was taken to calibrate the seeder correctly before and during seeding.

5) The fairways were closed for two weeks. Play was resumed with carts 14 days after seeding, with the fairways

roped off. The players placed their golf balls along the side of the ropes in specially-prepared roughs to simulate fairway conditions. Normal play with carts resumed within one month of seeding.

Others take a cue from PVCC

Pauma Valley Country Club has been very pleased with the positive results of their bermudagrass overseeding project. In fact, they overseeded the balance of their fairways with certified Yuma bermudagrass seed during the summer of 1997. Their success has prompted other courses to begin their own bermudagrass overseeding programs.

"We are very pleased with the success of our bermudagrass overseeding project. We learned that there are two very important keys to successful bermudagrass overseeding. The first key is to follow proper watering procedures. It is essential that the overseeded area must be kept moist through the germination period. The second key is keeping the carts completely off the fairways for the month following seeding. The specially prepared roughs helped us accomplish this while still allowing play. Proper watering procedures and keeping the carts off during the grow-in period are critical to the success of the overseeding. In addition, the certified Yuma bermudagrass has really performed well for us." □



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vigorous rooting and development of root tissue. The effect is even more pronounced when **NITROFORM®** is incorporated in seedbeds or sodbeds, in container soil mixes, or following core cultivation.

Because the N in **NITROFORM®** is released by soil microbes, it is resistant to leaching and runoff... even in sandy soils under heavy rainfall and irrigation.

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- **NITROFORM®** Enhances Microbial Activity
- **NITROFORM®** Promotes Rooting and Root Formation
- **NITROFORM®** Protects the Groundwater



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The walk-behind Aercore 800 delivers the same advantages found in the tractor-mounted Aercore 1000 and 1500. Specifically, the ability to deliver high productivity without sacrificing hole quality, durability, or ease of service.

Powered by an 18-hp Kohler engine, the 800 covers a lot of ground at a coring swath of 31.5-inches. Four gears allow you to match productivity and speed.

Like the 1000 and 1500, the "flexi-link" mounting design of the 800 helps ensure the tines



stay perpendicular to the ground longer for a cleaner hole. In addition, belt drive instead of chains makes it quieter, more forgiving, and easier to maintain.

Tine choices include solid and open-side design that combine with the four working speeds to deliver from 1.4" x 1.4" to 2" x 2.9" hole patterns at up to 3.5-inch depths.

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*Powered by an 18-hp Kohler engine,
the Aercore 800 can punch up to
571,725 holes an hour at a
coring swath of 31.5 inches.*



Circle No. 133 on Reader Inquiry Card

It ain't about green speed

A recent study gives fresh insight into the preferences and expectations of US golfers. Result shows they just want to play.

by KEITH HAPP

What type of experience do golfers want to have when they visit your course? A recent study by the National Golf Course Owners Association offers insights into golfers' attitudes, including why they play golf, why they play the courses they play, and what features are important to them when choosing a golf course.

The main topics the study addresses are:

▶ How golf enthusiasts use course facilities (amount of play, use of practice areas,

and the use of golf club houses);

▶ Golfers' views and preferences regarding a host of golf course features, services and amenities.

Tee time availability

The consumer study indicated that there are five underlying themes in the reason why people play golf:

▶ outdoor pleasure, including enjoying natural surroundings and getting some exercise;

▶ challenge of the game, including hitting the ball accurately and improving their game;

▶ companionship, including being with family, business contacts and friends;

▶ taking part in the tradition of golf;

▶ competition.

The survey included a list of 53 amenities, features and characteristics of golf courses. For each, the respondent was asked to rate it in terms of its importance in deciding where to play. The following 10 items were most often rated of high importance

by all the respondents.

1) Tee times available when you want them.....78%

2) Availability of drinking water on the course.....76%

3) Yardage markers.....71%

4) Availability of restrooms.....68%

5) Smooth greens.....68%

6) Conditions of fairways/roughs.....68%

7) Cost of green fees....66%

8) Quality of the food.....63%

9) Hole description on score card.....62%

10) Practice putting green.....57%

The study looks at all 53 amenities, categorizing them as either general course features, access, practice facilities, cost factors, food and beverage service, pro shop and golf carts.

Included in the study is a section that tells the reader which group preferred which amenities.

More courses, more golf

Additionally, the study measured the attitudes and reactions of golfers to new developments and trends in golf.

For example, respondents were asked what their attitudes might be to the possibility of more courses being available in their vicinity, and to a number of potential developments in golf courses.

While almost five out of 10 say they would shop for the best green fees, four out of 10 say they would play more often. In other words, both outcomes are likely to occur.

A similar number indicates that more golf courses would facilitate their access, by making it possible to play at more convenient times.

Finally, the study considered findings indicative of special target groups, including the differences between the attitudes and motivations for men and women; private, semi-private and daily fee course players. □

This article originally appeared in the Central Ohio GCSA news.

Close to home counts

The following results from the NGCOA survey indicate the basic golfing characteristics of survey respondents:

▶ 97 percent of the respondents indicate they play golf near their home an average of 39 times per year. Also, 73 percent indicated they play golf on vacations an average of 5.2 times per year, while 26 percent play golf on business trips an average of 4.6 times per year.

▶ Of the total, 45 percent of respondents says they play golf primarily on weekdays, and 40 percent say they play mostly on weekends. There is, however, quite a bit of variation in this number between different types of players. For example, relatively strong weekend play is apparent among players under 55 who can be expected to have full time occupations, and players with incomes of more than \$120,000.

▶ The most regular users of the driving range are low handicap players, and higher income players. Also, relatively many private course players (17 percent) say they always use the driving range.

The study is based on a survey mailed to a national sample of 10,000 households known to include regular golfers. The survey and report were compiled by C&R Research in Chicago.

Returns were obtained from just over 2000 respondents, for a 20 percent response rate. About 80 percent of those respondents are men, 20 percent are women. The respondents included all age groups starting at age 18.

It's time for action.



We've been talking about IPM and experimenting with ways to be more environmentally responsible. Now that a product like BIO-TREK 22G has come along, there's no excuse for fighting common turf diseases the old way. We waited until we saw the disease, then slammed it with chemicals. Now, with BIO-TREK 22G, we can prevent infection long before we'd ever see it.

BIO-TREK 22G is a beneficial fungus that colonizes the roots and fights off pathogens like *pythium*, *rhyzootonia*, *fusarium*, and *sclerotinia*. Plus – it's EPA approved and safe for use even around water. A lot of golf courses have already tried it and proved the overwhelming success of BIO-TREK 22G.

Last year we experimented. This year we go for it.

BIO-TREK 22G™



WILBUR-ELLIS

IDEAS TO GROW WITH®

For more information, contact your Wilbur-Ellis representative or your BIO-TREK 22G distributor.

Circle No. 134 on Reader Inquiry Card

Equipment care as simple as 'a glance'

A key component of a turfgrass maintenance operation is the equipment available to perform both daily course preparation and, if needed, major renovations.

Some courses are blessed with a large supply of equipment, but it is the equipment that is serviced and ready to use that greatly influences the planning of turf care activities.

The superintendent relies heavily on the mechanic to maintain this equipment, no matter how old or new it may be. To some degree, the entire turf maintenance staff is responsible for the care of the equipment.

It is a well known fact that preventive maintenance programs can extend the useful life of a piece of equipment.

To a turf manager, a more important aspect of preventive maintenance is that it allows for effective and efficient flow of turf maintenance activities on the course.

This thought was brought into mind when Steve Geller, golf course superintendent and his mechanic Joseph Pope, designed a preventive maintenance system for the equipment at the Cedar Point Club in Suffolk, Va. The system allows the entire crew to participate and share responsibility for equipment upkeep. This strategy provides support for the superintendent and mechanic while fostering a team spirit among the crew.

Steve plans course grooming and maintenance activities well in advance of their occurrence. Prior to doing so, Steve consults with the mechanic and checks an equipment status board located in the shop area.

The board lists all of the equipment inventory. Everything from greensmowers to string trimmers is scheduled for regular maintenance is identified as well as the previous service date.

A significant element of the status board is its simplicity. The maintenance aspects of each piece of equipment vary, but when the equipment (which is

numbered) is ready for use, it is clearly identified as such with a green mark in the status column.

A red mark means the equipment is down or needs to be serviced. This marking system reduces the chances of equipment escaping regularly scheduled maintenance and causing unplanned downtime.

Crew involvement begins when jobs are assigned.

The plans for the day are placed on a job board located in the lunch/locker room. With job assignment in hand, crew members check the status of the equipment needed to complete the day's activity. The status board is conveniently located so that it's easy to tell by a quick glance at the color code, the status of the equipment.

The system is reinforced further by crew members when they report minor equipment performance flaws. Small problems are addressed before they become large.

No system is infallible. Granted, when a new piece of equipment is severely damaged, a crew member will not mistakenly take it out onto the course. There are times, however, when equipment problems go unnoticed, and needless to say, the most aggravating problems are those that could have been prevented. For example, due to busy golfing schedules at Cedar Point Club, a great deal of mowing is done before daylight. A reel can be out of adjustment and cause a poor quality cut. Even worse, a hydraulic hose may give way, and cause a slow leak that does not immediately impair equipment performance.

Both of these problems may go unnoticed until the sun begins to rise. Strategies for unexpected damage control must then be implemented. Turf may have to be removed and/or turf damage repaired. **LM**

*by Keith Happ, writing in the Central Ohio
GCSA News.*

The status board is conveniently located so that it's easy to tell by a quick glance at the color code, the status of the equipment.

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HOLE.**



In a single stroke, professional golf course superintendents can control dollar spot, leaf spot, spring dead spot, melting out, brown patch, crown rot—in fact, more than 15 tough diseases in all. They do it with Eagle® fungicide, one of the tools every pro should have in his bag of tricks.

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As part of a 14-day protectant schedule, Eagle offers unbeatable disease control, exceptional turf safety, and easy handling. With performance like that, it's no surprise so many pros Eagle every hole.

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**For top-flight
performance.**

Gore eases FQPA harangue; wants 'sound approach'

Vice President Al Gore, in apparent response to intense Green Industry and congressional concerns over implementation of Food Quality Protection Act mandates, has asked the EPA and the Secretary of Agriculture to work together to pursue a "sound regulatory approach," to the mandates.

"I am requesting that the EPA...and Secretary of Agriculture work together to ensure that implementation of the paramount public health goals of the new law is informed by a sound regulatory approach...EPA and USDA should provide an initial report to me on implementation of this memorandum within 14 days..." wrote Gore in his directive.

The four page memorandum to USDA Secretary Dan Glickman and EPA Administrator Carol Browner outlines a series of "Implementation Principles" which require decisions based on science, communication and public input. Many of the principles address specific problems the regulated industry has been experiencing in trying to work with the EPA, reports the Golf Course Superintendents Association of America.

Prior to the directive, more than 30 key staff and volunteer representatives of 17 Green Industry-related associations were present at the Specialty Pesticide Association Leaders Conference, March 25.

Responsible Industry for a Sound Environment (RISE) sponsored the meeting, which brought together executives with interests ranging from golf course management to residential and school pest control operators.

Those present expressed concern that the Environmental Protection Agency (EPA), in an effort to implement Food Quality Protection Act mandates, will act hastily in the absence of pertinent scientific data, and cancel a number of food crop pesticides which have essential non-farm uses. □

ASGCA has free advice on remodeling a golf course

The American Society of Golf Course Architects (ASGCA) offers a 12-page brochure for anyone who might be considering a golf course renovation. The brochure is entitled *Remodeling Your Golf Course*. It covers key areas to consider in a remodeling project. These include the rationale and benefits of remodeling; advice on drafting a remodeling master plan; and costs, funding sources and other factors relating to construction.

To obtain a free copy, send a self-addressed, stamped business-size envelope to the American Society of Golf Course Architects, 221 N. LaSalle St., Chicago, IL 60601. Phone: 312/372-7090, fax: 312/372-6160, Website:

www.golfdesign.org.

ASGCA supports foundation

ASGCA also announced its financial support of "Investing in the Beauty of Golf," a \$3.5 million initiative launched by the Foundation of Golf Course Superintendents Association of America. The purpose of the initiative is to foster educational and applied scientific research programs on golf courses and the environment.

ASGCA elected three new associate members—Mike Benkusky, Marengo, IL; Ken Kavanaugh, Tucson, AZ; and John Fought, Aurora, OR.

Benkusky is an associate of Lohmann Golf Designs and his work includes Bishops Bay G.C., Middleton, Wis.; and Boulder Ridge CC, Lake in the Hills, IL. Kavanaugh, designed Southwyck GC, Pearland, TX; The Vistas at Westbrook Village, Peoria, AZ; and Seasons Ridge GC, Lake Ozark, MO. Fought is principal of John Fought Design/OB Sports LLC and is responsible for such layouts as Big Sky Golf & CC, Pemberton, B.C., Canada; Crosswater, Sunriver, OR; Langdon Farms GC, Aurora, OR; Rush Creek GC, Minneapolis, MN, and The Reserve, Portland, OR. □

Golf course construction rolls on

Golf course construction remains strong. The greatest activity is occurring on 9-hole daily fee courses, according to a release from the National Golf Foundation. Below is a recap of activity in 1997:

TYPE	PROJECT COMPLETIONS			PROJECTS UNDER CONSTRUCTION		
	18-hole	9-hole	total	18-hole	9-hole	total
New Facilities						
Daily Fee	78	148	226	97	390	487
Municipal	6	24	30	22	68	90
Private	6	23	29	6	72	78
Total	90	195	285	125	530	655
Additions*						
Daily Fee	100	8	108	159	31	190
Municipal	16	0	16	28	10	38
Private	20	0	20	35	14	49
Total	136	8	144	222	55	277
Grand Total	226	203	429	347	585	932

*Addition to existing facility



My fairways never looked better or healthier, and my fungicide budget went down, too.

*- Bruce Burchfield
Fox Run Golf Club
St. Louis, Missouri*



Our turf is good, we're not sodding, and we're not spending huge amounts of man hours to babysit greens through the stress period.

*- Wayne Mills
Valencia Country Club
Valencia, California*



**Now You Can Use Less Fungicide Per Application,
Cut Your Costs, And Get Greener, Healthier Grass, Too.
Just Turn The Page To Find Out How.**





WEEK 1



WEEK 2



WEEK 3



WEEK 7



WEEK 8



WEEK 9

Switch To A Reduced Rate* Daconil U For A Great Looking Course W



golf courses around the country. Now, more and more superintendents are discovering that Daconil Ultrex fungicide, with its exclusive Super

Thanks to their unmatched sticking and staying power, Daconil® fungicides have long demonstrated superior broad spectrum disease control at

Weather Stik™ formulation, sticks and stays so well, you can use it at much lower rates* on a regular 7 to 10 day, preventative schedule for even better results.

Why a preventative schedule? Because disease can already be at work, doing damage to your turf well before visible symptoms appear. Even if you react at the first signs of disease, you could be reacting too late, and your grass might never fully recover. But a preventative



WEEK 4



WEEK 5



WEEK 6



WEEK 10



WEEK 11



WEEK 12

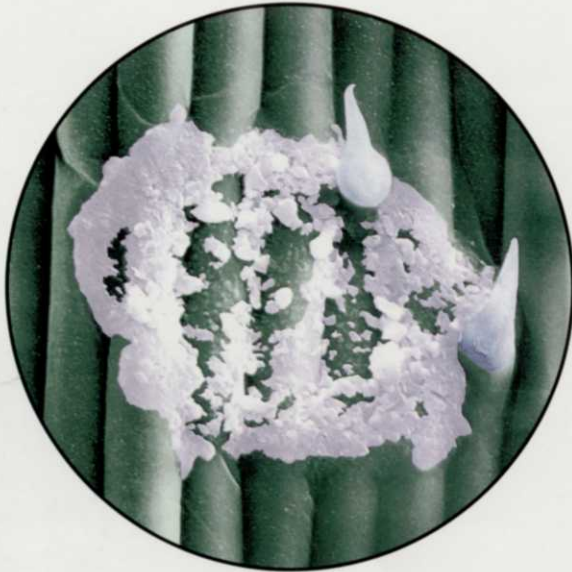
Ultrax[®] Short Interval Spray Schedule Week After Week After Week.

program stops disease before it can start, and that's one reason this approach makes so much sense.

You also put down less fungicide at any one time, which club members will love. You can eliminate systemics to cut total fungicide use and save money. And above all, you get great looking grass. In fact, we guarantee you'll be happy with the results, or we'll give you enough Daconil Ultrax to respray your course using your old program.[†]

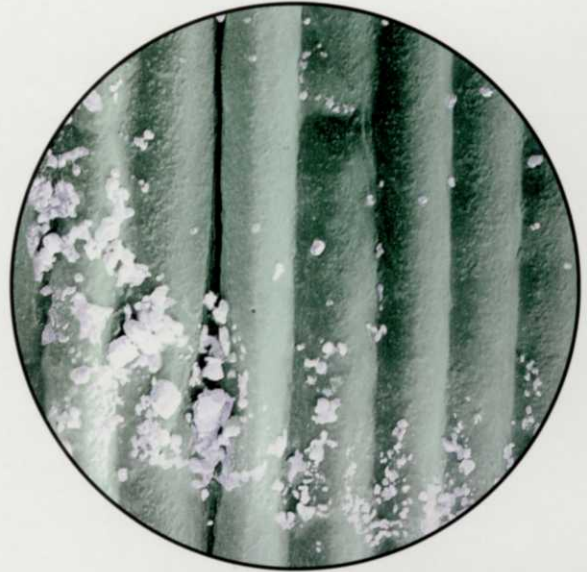
Just ask your distributor for all the details. And if you're still not convinced, ask to take the Daconil Challenge, and get enough free product to try this program on a green, tee, or fairway for an entire season. Daconil Ultrax reduced rate spraying. It could put you on a better course than ever before.





DACONIL ULTREX

after a 1/2" rain stress (SEM - 500X)^{††}



GENERIC FUNGICIDE

after a 1/2" rain stress (SEM - 550X)^{††}

See For Yourself How The Stick And Stay Power Of Super Weather Stik Makes Reduced Rate Spraying Possible.

Scanning electron microscopy of treated plant samples lets you see for yourself just how much better the Super Weather Stik formulation of Daconil Ultrex sticks and stays compared to the generic competition. And it's that stick and stay difference that makes Daconil Ultrex reduced rate spraying possible. So if you're tempted to try a similar program with some generic, just remember that the very thing that makes these reduced rates effective is the very thing generics lack — the sticking and staying power of Super Weather Stik.

Of course, with Daconil Ultrex, you also get exceptional

handling, superior mixing, and easy packaging disposal with no containers to triple rinse. And remember, too, there's never been a documented case of disease resistance to a Daconil brand fungicide in over 25 years, which means you can continue to count on Daconil Ultrex for top disease control — one more good reason to put our reduced rate Daconil Ultrex short interval spray program to work for you.



Always follow label directions carefully when using turf and ornamentals plant protection products.

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*For best results, we recommend using 20% lower application rates on a 7-10 day schedule. Section 12(a)(2)(G) of FIFRA provides that it is unlawful for any person "to use any registered pesticide in a manner inconsistent with its labeling"; quoted language is defined in section 2(ee) of FIFRA and expressly excludes the act of "applying a pesticide at any dosage, concentration, or frequency less than that specified on the labeling unless the labeling specifically prohibits deviation from the specified dosage, concentration, or frequency." Thus, in the absence of specific label prohibitions, it is not unlawful under section 12(a)(2)(G) to use a registered pesticide at a dosage, concentration, or frequency less than that specified on the labeling of the pesticide.

User must have label in possession when applying these rates.

†For a copy of our Daconil Ultrex Super Weather Stik Guarantee, write to Daconil Ultrex Guarantee, ISK Biosciences Corporation, Turf & Specialty Products, 1523 Johnson Ferry Rd., Suite 250, Marietta, Georgia 30062

†† Micrographs have been colorized for demonstration purposes.

Howard Johnson's Enterprises, Inc., Milwaukee, appointed John L. Mitchell as the chief operating officer. Mitchell's background includes selling, marketing and management position in ag and industrial chemicals. He's been with the company the past five years.

Pest control and turf management product information from **Zeneca Professional Products** is available by facsimile. Call 1-800-640-2362 toll free, 24 hours a day, 7 days a week for quick retrieval of documents on any fax machine. Product information will be promptly sent directly to your fax machine. Customers can receive product labels, MSDSs, Worker Protection Standard requirements for products currently offered by Zeneca.

Curtis Clark is new marketing manager for **Riverdale Chemical Company**, Glen-

wood, IL. Clark is responsible for all marketing and advertising activities. His background includes marketing assignments for Troy Biosciences and American Cyanamid's turf and ornamental group.

Tessengerlo KERLEY, Inc., Phoenix, AZ, is acquiring **Karsten Turf**. "It is our hope to finalize the acquisition within the next 90 days and to make the integration of key Karsten turf personnel within our sports turf organization as seamless as possible for both companies," reported Jordan Burns, president of **Tessengerlo KERLEY**. "The product strengths of Karsten Turf significantly complement those of our liquid plant nutrient products and allow us to offer a more complete package of turf management products and services to golf course superintendents and turf managers," added Gerald Kolb, group vp, ag, for TK.

Plant Health Care, Inc., Pittsburgh, PA, got a very good rating from Eco-Rating International, a 6-year-old environmental rating agency. PHC's products and services were judged to possess highly desirable environmental impacts. "This is an excellent rating for a company this young," says Marc M. Baum, Ph.D., president and CEO of Eco-Rating. PHC, established in 1994, produces the world's largest selection of mycorrhizal-based products in addition to time-release water polymers, biostimulants, beneficial bacteria and organic-based soil nutrients.

RohMid L.L.C., the joint venture between Rohm and Haas and American Cyanamid Company, has been working with nearly 100 golf courses across the country in a demonstration program of MACH 2 turf insecticide. It was registered by the U.S. EPA on May 21, 1997. Ac-

cording to John Thomas, Ph.D., RohMid manager, the program will give superintendents experience with a product few have had the opportunity to test. A 1.5 percent granular formulation is available for use on all turf sites. Also, a liquid (25C) will be available for use on golf courses, commercial landscapes and sod farms during the 1998 use season.

Rohm and Haas Company has received approval to change the Eagle label, reducing the recommended application rate of the fungicide from 0.6 to 0.5 ounces per 1,000 square feet with a 14-day application schedule. Another new option allows application of Eagle at 1.2 ounces per 1,000 square feet on 28-day application intervals. The different rates apply to all turf applications. New labeling makes it more cost-effective for superintendents to prevent and control dollar spot and other turf diseases.

John Deere reports that all John Deere domestic ride-on lawn and garden products will be shipped in the company's reusable containers—Envirocrates. A larger version of the crate will allow 325, 345, 425, 445 and 455 lawn and garden tractors to be included. Deere introduced the reusable welded-steel container in July 1994 to replace its disposable steel and wooden crates. Deere expects to eliminate 4,800 tons of wood waste and 2,600 tons of steel waste each year by using the Envirocrate shipping containers. **LM**

Info center

VIDEOS AND LITERATURE FOR THE GREEN INDUSTRY

SALT-AFFECTED TURFGRASS SITES: ASSESSMENT AND MANAGEMENT... 250-page hard-cover book authored by Robert Carrow and Ronald Duncan helps turfgrass managers identify and pinpoint salinity problems and gives them the tools to implement effective management strategies. Price \$54.95. Contact: Ann Arbor Press, Inc., 121 South Main St., P.O. Box 310, Chelsea, MI 48118. Phone, 313/475-8787; fax, 313/475-8852.

VIDEOS MAKE WATER FEATURES PROFITABLE... "Growing Your Water Feature Business" video training set. Tape 1: Advanced Construction Techniques. Tape 2: Landscaping Your Waterscape. Tape 3: Designing, Selling & Estimating Water Features. Separately \$19.95. Complete set \$4995. Contact: Aquascape Designs, 1130 C. Carolina Drive, West Chicago, IL 60185. Phone: 800/306-6227.

THE POWER OF HYDRAULICS... Free, full-color product guide. Contact Stanley Hydraulic Tools, 3810 S.E. Naef road, Milwaukie, OR 97267-5698. Phone: 503/659-5660. Fax: 503/652-1780. For English version ask for part #31838. For Spanish version ask for part #31839.

Unit for finish grading, seed prep

The Winds Landscaper Special is a workhorse for golf courses and sports field construction. This 8'6" unit finish grades and prepares turfseed planting beds with its double V



cutting blades and 16 S-tines. A cylinder on a parallel linkage raises the unit to maintain a level cutting and mixing action. It is self-leveling, and also has a two-bar harrow with verti-

cal and tine adjustments. It requires a 40 hp or larger tractor.

For more information contact Western Illinois New Design Systems at 309/426-2171, or

Circle No. 261

Superior cut with Hustler's UpperCut Deck

Excel Industries, Inc. offers the new 48" UpperCut deck, a dual-trim, rear-discharge, mulching/catching deck for the ShortCut line of commercial turf equipment. This unit is a giant step forward in mulching technology.

Virtually all mulching or recycling decks trap the grass under the deck to cut and recut the blades. As it does this, new material is constantly being added as the mower moves forward. As a result, you get an embarrassing deposit of clumped grass whenever you stop or slow to turn. The UpperCut solves this problem this way: 3 mowing blades cut the grass and channel it up above a center blade to the UpperCut chamber. Here 4 combination cutter/fan blades cut and recut the grass and discharge it out the rear.

Two negatives about rear-discharge decks have been the quality of cut and the quality of finish. The UpperCut provides a superior cut because the grass is not discharged directly out the back but is channeled into the UpperCut chamber which is above the middle blade. Consequently, the deck wraps completely around the back side of the blade creating excellent suction for a great quality of cut.

Learn more about this unit at www.excelhustler.com or contact Excel Industries at 800/395-4757.



Circle No. 262

Netafim adds DC controller and valve



The New Netafim Miracle DC Controller in Lockable Outdoor Pedestal

Netafim Irrigation, Inc., offers three new models in its Miracle Irrigation Controller line. The models can be powered for a full irrigation season by a single 9-volt battery. Also newly available is a lockable outdoor pedestal.

The new DC Miracle controllers, with protective outdoor cabinets, are available in 6, 9 and 12 station models and make up one half of a complete control system. The other half of the control system is a new "Aquanet" DC valve developed by Netafim that uses reliable motorized technology versus a traditional latching type solenoid. The Aquanet valve allows the user to select from three different modes: automatic, manual (through the use of internal bleed), and "off" to isolate it from operation by the controller.

Additional features of the Miracle Controller include self-diagnostic testing of individual stations; automatic stop at the "off" position when scrolling; 3 independent watering programs; 4 start times; 1 minute to 10 hours run time; rain and soil moisture sensor input; 7 day schedule, both calendar and skip days; 10 percent-200 percent water budgeting and over current protection.

Contact Netafim at 800/777-6541 for more details, or

Circle No. 263



Foursome™
Poa Trivialis Blends

Savvy™
Intermediate Ryegrass Blends

Customer's Choice™
Customized Blends

Voyager™
Perennial Ryegrass Blends

BestBents™
Bentgrass Blends

Impress™
Fescue Blends

One Reliable Brand

That brand is Terra®. With a wide selection of blends, we've got you covered on golf course greens, fairways, roughs, non-play areas, lawns, landscapes, sports fields, parks, right-of-ways and commercial areas. The best of hearty, attractive bentgrass, poa trivialis, perennial ryegrass, intermediate ryegrass and fescue varieties – specially blended

to provide top performance. Plus, they're backed by in-depth research, agronomic expertise and timely delivery. Terra's high-quality seed and excellent selection of turf care products make Terra the one-stop shopping place for your turf needs. Talk to your Terra Professional Products representative today.



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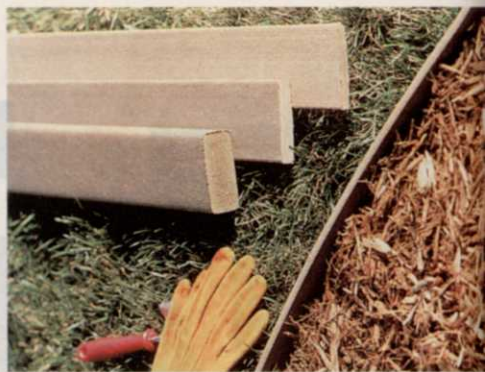
> PRODUCT REVIEW

Edging that does not rot, splinter

Landscapers now have a solution to landscape edging subjected to rotting, cracking and insect infestation. Trex Benderboard resists moisture, insects and UV rays, so it will not rot, splinter, split or crack. It's more flexible than wood. Bending around tight curves

is easier and there's no need for multi-layering. Creating straight runs is also easy with Trex Benderboard. It is durable enough to be used as a mow strip and resists damage by string trimmers. Only stakes are needed to hold it in place and conventional fasteners may be used.

No special tools are needed to work with Trex, although carbide-tip blades per-



form best. It is available in Winchester Grey, which starts out brown and weathers to deep, rich grey hues after six to 12 weeks of being outdoors. Profiles include 2X4, 1X4 and 1/2X4, all in 16-foot lengths.

Trex is available at more than 1,500 lumber dealers in the U.S. and Canada. To find a Trex dealer near you, call 800/289-8739.

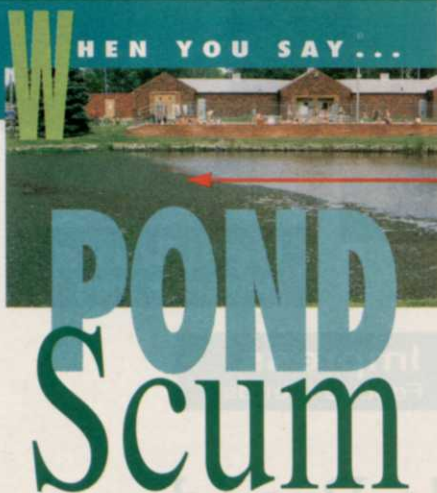
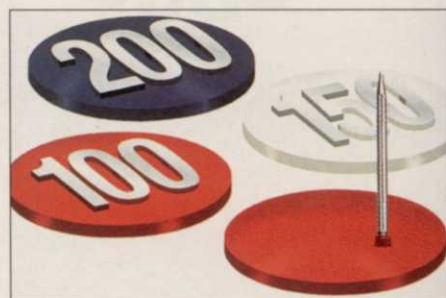
Circle No. 264

Durable, easy-to-read distance markers

Providing players an easy way to determine the distance to the green can quickly boost the appeal of your course. Par Aide's new, cast aluminum, fairway distance markers deliver high visibility, long-term durability, and easy maintenance. The polished brushed aluminum numbers stand out against the powder-coated red (100 yds.), white (150 yds.) and blue (200 yds.) indicators. An offset spike mounts these markers flush with the turf and keeps them exactly where you set them.

For more details on specialty distance markers, contact Par Aide at 888/893-2433, or

Circle No. 265



WE TAKE IT PERSONALLY.

That's Why We Created PondSaver™ - The All-Natural Pond Treatment That Improves Water Clarity and Quality.

It's true. PondSaver™ dramatically reduces clouding, sludge and unpleasant odors. Within weeks. And without toxic side-effects.

Unlike conventional chemical treatments, PondSaver™ is a concentrated blend of 17 proprietary strains of dry, live bacteria that quickly and naturally degrade the nutrients, organic matter and hydrocarbons, clearing the water in small ponds and lakes.

PondSaver™ Microbial Concentrate Cleans, Clarifies and Deodorizes All in One Step - to Rapidly Restore a Balanced Aquatic Ecosystem.

PondSaver™ comes prepackaged in easy-to-use 1/2 lb. water soluble paks for simple, no-measure application. Also available in bulk granular form for larger scale applications. There's no preparation required - paks can be dropped directly into the water. You'll see the difference after one application. And a simple regimen of regular follow-up applications lets you maintain a healthy, balanced ecosystem... indefinitely.

Introductory Offer
\$10 OFF
your next purchase
of PondSaver™

"In 48 hours most surface sludge was gone and the rest was clearly disappearing. I was amazed, so was golf course management."

Robert Ras, Irrigation Technician
Bos Landen Golf Course

WHEN IT COMES TO SAFETY, SIMPLICITY AND VISIBLE RESULTS,

PondSaver™
is the "clear" winner in effective pond maintenance.

For more information on PondSaver™ and other natural products from Plant Health Care, call PHC, Inc. or your PHC representative today.

1-800-421-9051

www.planthealthcare.com

PondSaver™ is a trademark of Plant Health Care, Inc. © 1998 Plant Health Care, Inc. Pittsburgh, PA
Special offer expires August 31, 1998. Not valid with any other offer.

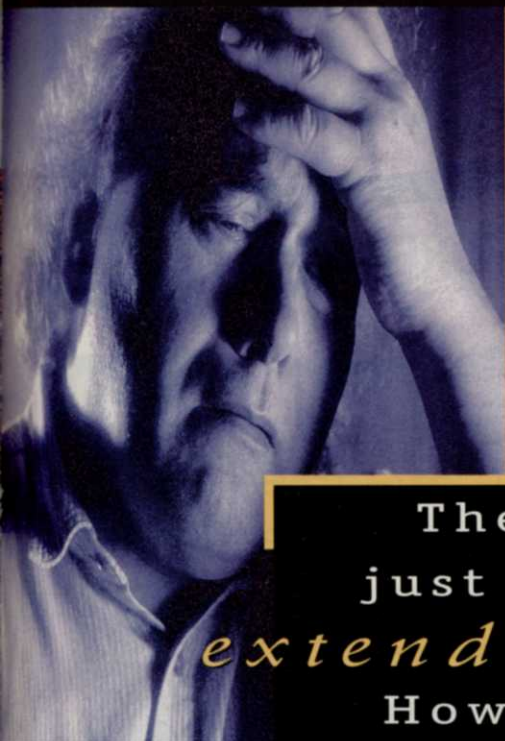
Circle 150

38M98P3



Each gram of PondSaver™ contains over 4 billion colony forming units of bacteria together with a proprietary blend of enzymes and growth factors to maximize product performance.





The crew
just went on
extended break.
How's your
headache now?

What a great time for a hose to fail!

Now your crew can relax and enjoy the morning sun while you send someone to find the right replacement. And, by the way, could it please be a place that can fabricate the hose assembly on the spot? Pass the aspirin. It's going to be a long day!



It's like having a hose & fittings engineer on staff.

- ParkerStore emergency service means help is just a phone call away, 24-hours a day.
- Factory-trained professionals
- We can help troubleshoot your problem.
- Advice that comes from experience

When your normal impossible day takes a turn for the worse, stop running around for parts and stop in your nearest ParkerStore. For total hose and fittings products and service, your ParkerStore has what you need to feel better fast.

ParkerStores. We give new meaning to the words "just-in-time."

A ParkerStore is a complete hose and fittings inventory that's near where you work. At ParkerStores, we make sure you have the hose and fittings products you need, when you need them.

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- Metrics (JIS, BSPP, EO, BSPT)
- Custom hose assemblies made while you wait
- All major thread configurations



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Dr. Terrance P. Riordan
Turfgrass Plant Breeder
University of Nebraska



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> PRODUCT REVIEW

On the wheel tire repair kit

North Shore Labs offers a Safety Seal tire repair kit which permanently repairs all punctures and slices, as well as sealing from the thread to the inner liner. This 'On the Wheel Tire Repair' is safe, economical and easy to use.

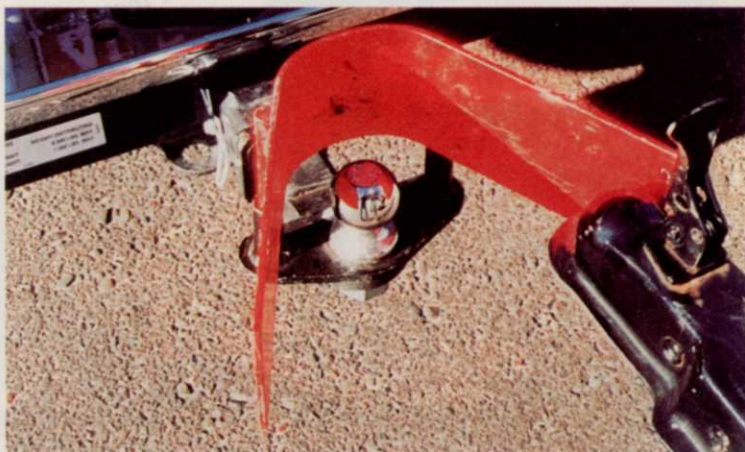
For more details contact NSL Distributing, Inc. at 800/888-9021, on their website at www.safetyseal.com, or

Circle No. 266



One person vehicle/trailer alignment

The 'Hitch Playte', from Quest Manufacturing and Sales, Inc. allows one person to align a vehicle and trailer without assistance. Back up to the trailer and the 'Hitch Playte' will guide the tongue over the hitch ball. Placed on the bumper or receiver hitch, the 'Hitch Playte' also prevents



damage to the bumper and license plate and is easy to assemble and remove. The two-part system consists of the base plate, installed under the hitch ball, and the V-guide which fits into the slots of the base plate.

This product (item #400303) is available from Overtons at 800/334-6541, or www.overton.com or

Circle No. 267

Trailer lock to prevent theft

The Trailer-Keeper is an economical theft deterrent system for trailers which prevents tire rotation so a trailer can't move. Manufactured by Fulton Performance Products, this rugged, steel, locking device attaches to the lug latches on a case-hardened steel rod. The rod is threaded through the wheel and tire and the lug latches are secured to the wheel lock bar with a special brass padlock. Installed in seconds, the Trailer

Keeper is adjustable to fit wheels up to 15" and can be used on almost any type of trailer.

For further information on Trailer Keeper, contact Fulton Performance Products, P.O. Box 8, Moosinee, WI 54455-0008, or

Circle No. 268



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Circle 149

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It's Like Christmas in July!

The 15th Annual International Lawn, Garden, & Power Equipment EXPO 98 is truly unique among all international trade shows for a very important reason: The 20 acre Outdoor Demonstration Area. This demo area is designed for you, the lawn and landscape professional. You'll be able to test hundreds of machines from over 170 manufacturers under actual working conditions. Factory representatives will be available to answer your application questions and explain new equipment features. In addition to the demo area, EXPO 98 offers indoor exhibits for over 600 manufacturers and free seminars that can help you grow your business more profitably.

This opportunity is not available anywhere else. Take advantage of this opportunity to test the tools of your trade side by side at EXPO 98. EXPO 98 will be held at the Kentucky Exposition Center in Louisville, KY on July 25, 26, & 27, 1998. For more information about EXPO 98 call (800) 558-8767 or (502) 562-1962 today.

Receive FREE information on products and services advertised in this issue.

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May 1998

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Signature: _____ Date: _____

Fill in ovals as shown: ●

1. My primary business at this location is: (fill in ONE only)

- 01 250 GOLF COURSES (Also fill in questions #3 & #4)
- 02 255 Landscape Contractors (installation and maintenance)
- 03 260 Lawn Care Service Companies
- 04 265 Custom Chemical Applicators (ground and air)

- 05 270 Tree Service Companies/Arborists
- 06 275 Landscape Architects
- 07 280 Land Reclamation and Erosion Control
- 08 285 Irrigation Contractors
- Other (please specify) _____

- 09 290 Sports Complexes
- 10 295 Parks
- 11 300 Right-of-Way Maintenance for Highways, Railroads or Utilities
- 12 305 Schools, Colleges, Universities
- 13 310 Industrial or Office Parks/Plants
- 14 315 Shopping Centers, Plazas or Malls
- 15 320 Private/Public Estates or Museums
- 16 325 Condos/Apartments/Housing Developments/Hotels/Resorts
- 17 330 Cemeteries/Memorial Gardens
- 18 335 Hospitals/Health Care Institutions
- 19 340 Military Installations or Prisons
- 20 345 Airports
- 21 350 Multiple Government Municipal Facilities
- Other (please specify) _____

- 22 355 Extension Agents/Consultants for Horticulture
- 23 360 Sod Growers/Turf Seed Growers/Nurseries
- 24 365 Dealers/Distributors/Formulators/Brokers
- 25 370 Manufacturers
- Other (please specify) _____

2. Which of the following best describes your title? (fill in ONE only)

- 26 10 Executive/Administrator- President, Owner, Partner, Director, General Manager, Chairman of the Board, Purchasing Agent, Director of Physical Plant
- 27 20 Manager/Superintendent- Arborist, Architect, Landscape/Grounds Manager, Superintendent, Foreman, Supervisor
- 28 30 Government Official- Government Commissioner, Agent, Other Government Official
- 29 40 Specialist- Forester, Consultant, Agronomist, Pilot, Instructor, Researcher, Horticulturist, Certified Specialist
- 30 50 Other Titled and Non-Titled Personnel (please specify) _____

3. Is your golf course:

- 31 A Public 32 B Semi Private 33 C Private 34 D Hotel/Resort 35 E Municipal

4. If you work for a golf course, how many holes are on your grounds?

- 36 1 9 37 2 18 38 3 27 39 4 36+

5. How many acres are maintained at your facility? _____

6. SERVICES PERFORMED (fill in ALL that apply)

- 40 A Mowing 45 F Turf Fertilization 50 K Paving, Deck & Patio Installation
- 41 B Turf Insect Control 46 G Turf Disease Control 51 L Pond/Lake Care
- 42 C Tree Care 47 H Ornamental Care 52 M Landscape Installation
- 43 D Turf Aeration 48 I Landscape/Golf Design 53 N Snow Removal
- 44 E Irrigation Services 49 J Turf Weed Control 54 O Other (please specify) _____

7a. Do you specify, purchase or influence the selection of landscape products?

- Yes No

7b. If yes, check which products you buy or specify: (fill in ALL that apply)

- 55 1 Aerators 62 8 Herbicides 69 15 Sweepers
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- 58 4 Chipper-Shredders 65 11 Mowers (reel/rotary) 72 18 Trucks
- 59 5 De-icers 66 12 Snow Removal Equipment 73 19 Turfseed
- 60 6 Fertilizers 67 13 Sprayers 74 20 Utility Vehicles
- 61 7 Fungicides 68 14 Spreaders

8. Do you have a modem? Yes No

101	113	125	137	149	161	173	185	197	209	221	233	245	257	269	281	293	305
102	114	126	138	150	162	174	186	198	210	222	234	246	258	270	282	294	306
103	115	127	139	151	163	175	187	199	211	223	235	247	259	271	283	295	307
104	116	128	140	152	164	176	188	200	212	224	236	248	260	272	284	296	308
105	117	129	141	153	165	177	189	201	213	225	237	249	261	273	285	297	309
106	118	130	142	154	166	178	190	202	214	226	238	250	262	274	286	298	310
107	119	131	143	155	167	179	191	203	215	227	239	251	263	275	287	299	311
108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312
109	121	133	145	157	169	181	193	205	217	229	241	253	265	277	289	301	313
110	122	134	146	158	170	182	194	206	218	230	242	254	266	278	290	302	314
111	123	135	147	159	171	183	195	207	219	231	243	255	267	279	291	303	315
112	124	136	148	160	172	184	196	208	220	232	244	256	268	280	292	304	316



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108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312
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112	124	136	148	160	172	184	196	208	220	232	244	256	268	280	292	304	316



1998 EMERALD AWARDS

ANNOUNCING: the third annual LANDSCAPE MANAGEMENT "Emerald Awards". LANDSCAPE MANAGEMENT magazine is offering a \$500 first prize to the winner of a random drawing to be held on July 1, 1998. Second prize is \$300 and third prize is \$200 in cash. To be eligible for the drawing, simply fill out the questionnaire at right and return it to LM's editorial offices.

Answers to the questions will determine our "1998 Emerald Awards" winners, to be revealed—along with the contest winner—in our August issue.

WIN \$500



CONTEST REQUIREMENTS: Contestants must be owners or employees of landscape maintenance companies or lawn care companies; or maintenance employees of a golf course or country club, including superintendents and assistant superintendents; or an athletic field manager or member of an athletic field maintenance crew; or manager or member of a facility landscape management crew.

Product selections must be currently used by entrant. Employees of Advanstar Communications or their families not eligible.

All questions on this entry form must be completed, and all blanks filled. One entry per person. No more than five entries from any one employer will be allowed. Entry forms will appear in the February-June, 1998 issues of LANDSCAPE MANAGEMENT.

Completed questionnaires should be mailed to: Emerald Awards, LANDSCAPE MANAGEMENT, 7500 Old Oak Blvd., Cleveland, OH 44130. They must be received by noon, July 1, 1998.

A random drawing of all eligible entry forms will be held July 1, 1998. Winners will be notified within 24 hours.

OFFICIAL ENTRY FORM

QUESTION:

What is your favorite brand name of...

CHECK HERE IF YOU DO NOT USE

riding mower?

walk-behind mower?

turf fertilizer?

pre-emergence herbicide?

post-emergence herbicide?

turf insecticide?

turf fungicide?

plant growth regulator?

compact tractor?

turf aerator?

pick-up truck?

leaf blower?

line trimmer?

chain saw?

Kentucky bluegrass?

perennial ryegrass?

turf-type tall fescue?

turfgrass mix or blend?

biological control product?

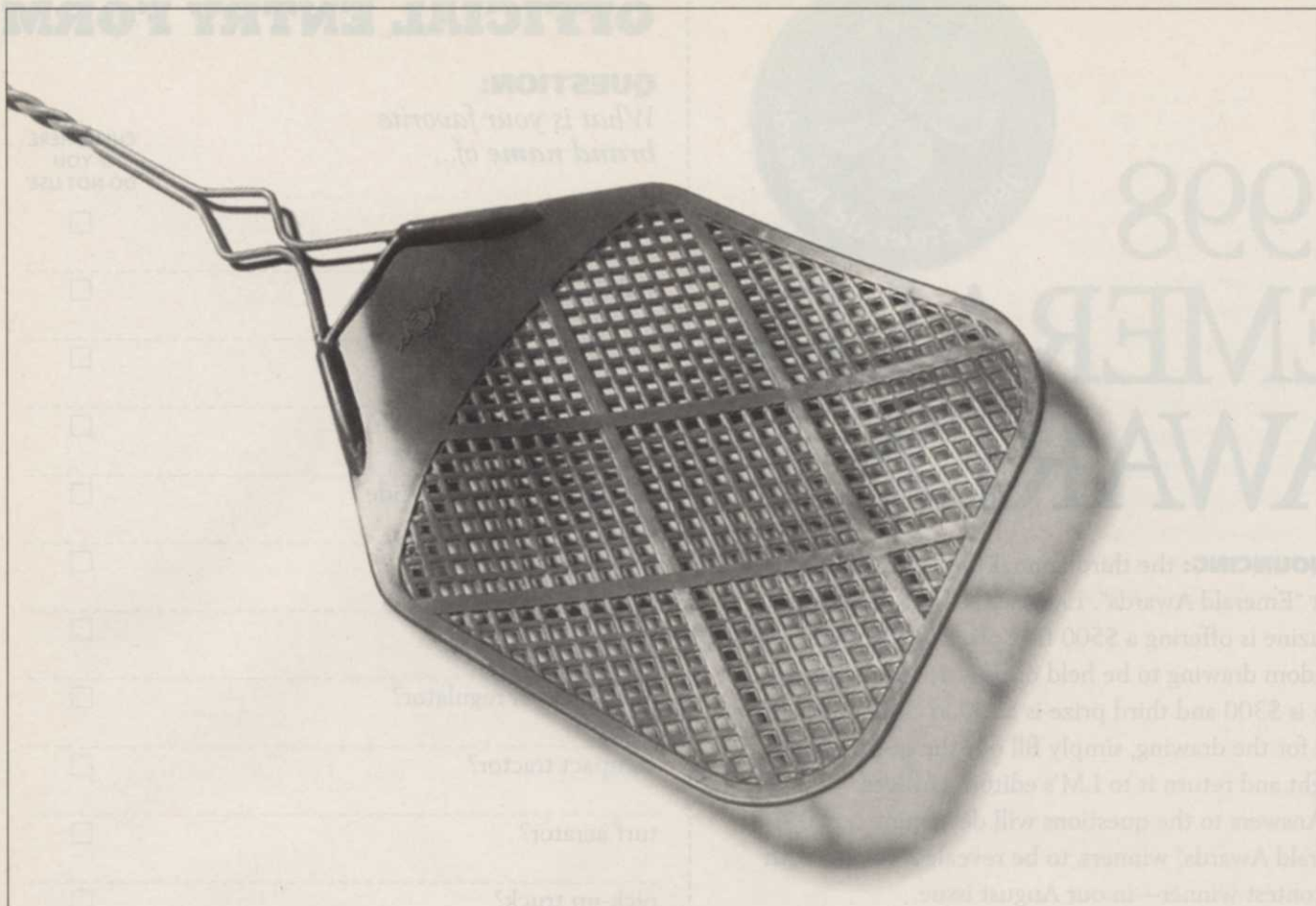
NAME: _____

EMPLOYER: _____

CITY/STATE: _____

PHONE NUMBER: _____

(AC) _____



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How come?

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So what?

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Events

MAY

18-19: Sports Turfgrass Management for Pros, The University of California Extension—Davis in cooperation with U.C. Cooperative Extension. Contact U. of Calif.—Davis at 530/757-8899 or 800/752-0881.

18-20: Storms Over the Urban Forest, Arbor Day Farm's Lied Conference Center, Nebraska City, NB. Call The National Arbor Day Foundation at 402/474-5655.

20: North Carolina Turf & Landscape Research Field Day, North Carolina State University, Raleigh, NC. Call Gene Maples 910/695-1333.

JUNE

6: A Workshop in Feng Shui UCLA, 175 Dodd Hall. Call ULCA Extension's Landscape Architecture Program at 310/825-9414.

18: Turf-Seed, Inc./Pure Seed Testing, Inc., Field Day, Hubbard, Or. Call 503/651-2351.

18-20: Super Floral Show, Columbus Convention Center, Columbus, Ohio. Call Jim Johnson 602/998-3992; 602/998-7838.

25-27: Southeast Greenhouse Growers Conference, Palmetto Center, Greenville, SC. Call Charles Hall 800/453-3070; 706/883-8215.

25: Selecting, Planting, Maintaining Urban Trees, University of California Extension, Riverside. Call 909/787-5804, ext. 1621.

JULY

5-8: Soil & Water Conservation Society Annual Conference, Hyatt Regency, San Diego. Call Charlie Persinger 515/289-2331.

6-11: Perennial Plant Assn. Symposium, Boston. Call Dr. Steven Still, 614/771-8431; 614/876-5238.

16-18: Turfgrass Producers Interna-

tional Summer Convention & Field Days, Sheraton of Tyson's Corner, VA. Contact Tom Ford 847/705-9898; 847/705-8347.

25-27: International Lawn, Garden & Power Equipment Expo, Louisville, KY. Contact Warren Sellers 502/562-1962.

28-30: Penn Allied Nursery Trade

Show, Fort Washington Expo Center, Fort Washington, PA. Contact Sandy Seltzer 717/238-1673; 717/238-1675.

AUGUST

2-5: International Society of Arboriculture Conference, Birmingham, England; Lisa Thompson, (217) 355-9411; (217) 355-9516. **LM**

Keeps lakes and ponds beautiful... and useful!

NEW AquaCure Aquatic Herbicide and AquaCure Aquatic Algaecide can keep your lakes and ponds serene and clean — without interrupting use of the water for irrigation and recreation.

- AquaCure treated lakes and ponds are available immediately for irrigation of putting greens, fairways and ornamental plants.
- AquaCure treated water can also be used without interruption for fishing and swimming.



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AQUATIC HERBICIDE

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AquaCure
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provides effective control of various filamentous, planktonic and branched algae in golf course, ornamental, fish, irrigation and fire ponds.

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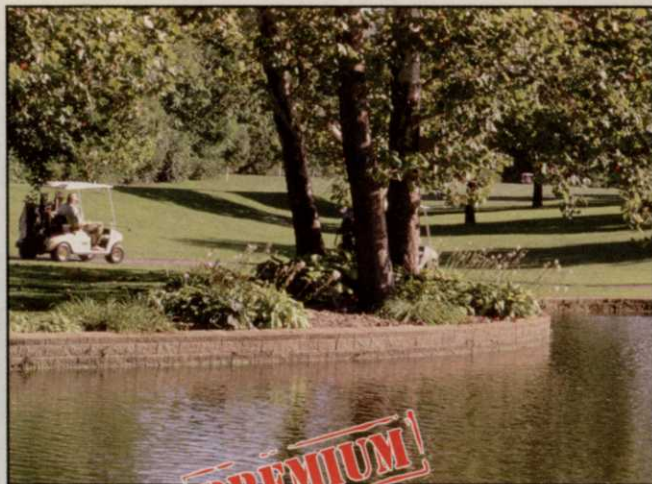
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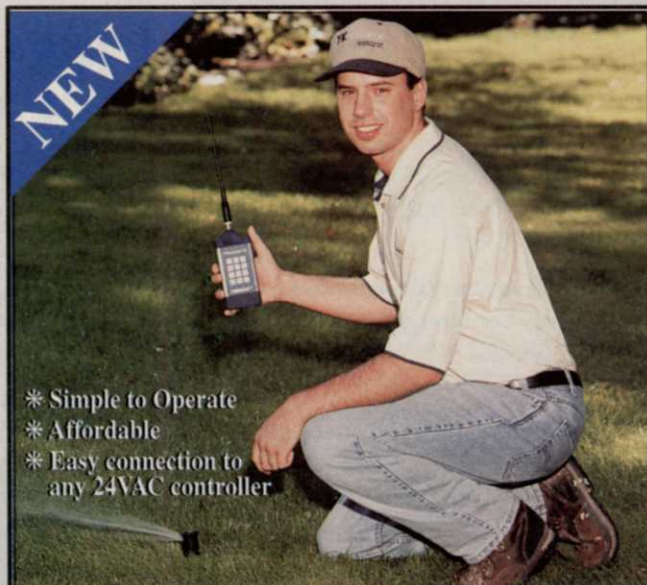
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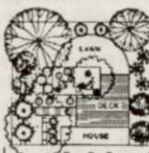
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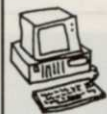
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"Give the old threesome a rest, and try something different!" says Bobbie Schwartz, owner of Bobbie's Green Thumb, a landscape design consultant and lecturer in Shaker Heights, Ohio. Her recommendations in the Ohio Landscape Assn.'s *The Growing Concern*, include:

Arabis caucasica (rockcress) with felty, gray-green foliage. Full sun to partial shade in well-drained soil.

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More color for deep South

It's hard to grow ornamental cherry trees in South Georgia but a University of Georgia scientist at the Coastal Plain Experiment Station, Tifton, GA, is testing a new cherry tree that can splash some early-spring color deep into Dixie. "We're recommending the Okame cherry tree for landscapes below Columbus, Macon and Augusta," said John Ruter a research horticulturist. "We can grow this tree all the way over to the coast in Savannah. And it will grow all the way up the Eastern seaboard to Massachusetts." Ruter started evaluating Okame in 1990 with a rooted cutting. The variety is commercially available in the wholesale trade, but not well known in retail nurseries yet.

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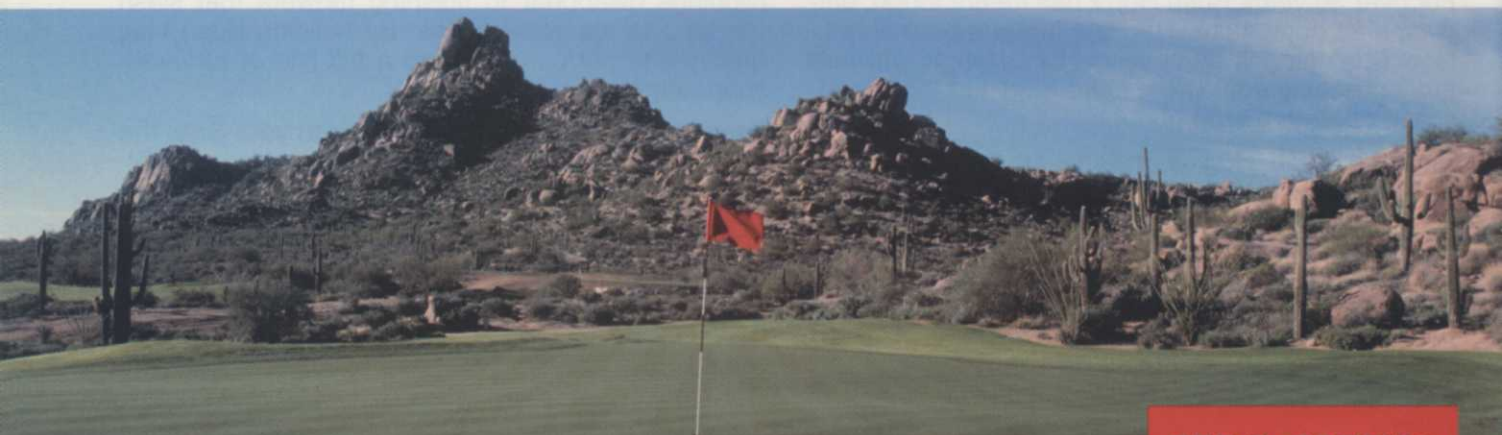
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