

"We were concerned that without extending the growing season, through the use of a turf cover, the sod wouldn't knit by March 23, when the baseball season started. I talked to Ken Mrock first [Chicago Bears Stadium Turf Manager] about covering it, and then did it. It worked well. When the cover was removed in March, the turf was ready to go."

Prior to covering the infield, Gaunky applied high K fertilizer and a snow mold control product. The turf cover was held down with six inch staples every six or eight feet along its seams.

Gaunky also uses the turf cover following overseeding. "One of the things you've got to do, especially in the spring, is use a soil thermometer, to keep the turf from getting burned," he advises.

Multiple Applications at Mile High

As a former Wightman protege, Mile High's Lujan *knows* turf covers and tarps. In fact, he uses three different products to meet his various needs.

"For baseball, we use a polyethylene tarp from American Tent and Canvas," he explains. "It weighs 6.3 ounces per square yard and is black on one side, silver on the other. The ideal colors would be white on one side, black on the other, but this material isn't available that way yet. In early April, when we still have a chance for snow, we use it in unheated areas of our field, over the snow. We also put it down immediately when it's raining."

Lujan's football field tarps are from Putterman & Company. They weigh 14 ounces per square yard and are made of vinyl. They are black on one side, white on the other, and are joined dielectrically. Lujan uses three tarps, from sideline to sideline, to blanket the entire field.

"The covers being black on one side, white on the other, gives us the flexibility to use them when baseball and football overlap," he says. "We can use the white side up during pre-season football, but in the late fall we can use black side up. It retains the sun's heat and helps us get through any early frost or snow we get."

For overseeding applications, Lujan uses Covermaster's Evergreen high-density woven polyolefin turf covers, which are the same size as the football field tarps.

"We run our field heating at 55 degrees F at the root zone, seven inches below the surface, so the roots stay nice and warm,"

he explains. "We're not getting a lot of growth — all we're doing is cutting off the tips of the grass when we mow. When the team is out of town, we aerate the field, overseed with Medalist 8, and then mat drag it in. Then we roll out the turf covers and use six-foot lengths of galvanized pipe to hold them down. The open weave turf covers allow water, air, and sunlight to get through, and at the same time a 'greenhouse effect' is created. If the temperature gets above 55 degrees, I pull the covers off quickly. But if it stays

around 30 or 40 degrees, I can leave them down for three days straight."

Turf covers and tarps can be significant investments, so it pays to do your homework before you buy. That means talking to turf managers using them successfully in your area, as well as manufacturers. Ask about color availability, weight, and application requirements as they pertain to your situation. Naturally, covers and tarps are no substitute for sound cultural practices such as proper irrigation, fertilization, and aeration. □

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6. Total number of maintenance staff for field.
7. Does baseball field have lighting for night games?
8. Number of events on baseball diamond per year.
9. Types and number of events on diamond other than baseball?
10. How many months during the year is the field used?
11. Why you think this field is one of the best?
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Grass Seed Developments: **BEST BETS FOR SPORTS TURF**

By Dr. Gil Landry

Before there can be sports turf, there must first be the grass with which quality fields are planted. University and private industry researchers have worked together over the years to discover, test, develop and cultivate superior varieties to withstand the rigorous demands of athletic play.

Turf characteristics in high demand for sports fields include: wear resistance, tolerance to various regional weather conditions, quick establishment and durability, and aesthetic qualities of rich color, fine texture, and dense, uniform growth patterns.

There's a growing interest by turf managers in endophyte-enhanced seed. Researchers report there are some overall plant benefits beyond insect and disease resistance. Endophyte-enhanced turf appears to be more tolerant to some stresses. There are, and will be, problems in producing and marketing endophyte-enhanced seed with the necessary longevity, the required persistence of the endophyte in the seed. But it's an area most seed producers are currently developing.

We've asked seed company researchers for their recommendations of the best varieties for sports turf use among their company's recent or pending instructions. Here are their recommendations, along with their reasons behind them.

Turf Merchants, Tangent, OR *Steve Tubbs, general manager*

Froghair intermediate ryegrass is a 1993 introduction. The intermediates are genetic crosses using annual ryegrass and perennial ryegrass in the parentage. Froghair ryegrass is designed for overseeding in the southern U.S. and is especially useful in overseeding into higher cuts of bermudagrass. It can be used in blends with perennial ryegrasses, fescues, and *Poa trivialis*. It's aggressive in establishment, upright in growth habit, medium textured at maturity, and darker in color than annual ryegrass. It exhibits somewhat less aggressive growth to aid in spring transition.

Affinity perennial ryegrass ranked first in the National Turfgrass Evaluation

Program (NTEP), 1991 Perennial Ryegrass Progress Report in summer density ratings, leaf texture ratings, and fall density ratings. It has a dark green color year round, with very good winter color and excellent spring green-up. Affinity with endophyte enhancement has high natural resistance to many turf pests and shows resistance to many turf diseases, especially Fusarium Patch, Brown Patch, Pythium Blight, and Crown Rust.

Zen brand seeded zoysiagrass exhibits heat and drought tolerance. It's adapted to a wide variety of soil conditions, grows in sun and shade, shows improved cold tolerance, and has good salt tolerance. It has a medium texture and medium green color. It spreads by both above-ground and underground runners. It exhibits excellent wear tolerance.

Viva (BA-366) Kentucky bluegrass was developed by O.M. Scott and Sons Company. It has bright green color, good drought tolerance in terms of wilting resistance and recovery from stress, and shows outstanding Dollar Spot resistance.

Turf Seed, Inc., Tangent, OR

Bill Meyer, vice president of research

Bright Star dwarf perennial ryegrass has made a great showing in the NTEP trials. It's resistant to cold and has good heat tolerance. It's proven excellent for overseeding in the South, and all across the U.S. in Alliance, a blend with three other very good perennial ryegrasses.

Confederate, a turf-type tall fescue, is especially good for the transition zones. It has excellent disease resistance and is proving itself a winner on athletic fields. It holds up well with lower maintenance and less water than perennial ryegrasses. It does take a little longer to handle play after reseeding than do the perennial ryegrasses.

Mowless is another new turf-type tall fescue. It's doing well on athletic fields in a mixture with Silverado, El Dorado, and Tomahawk, especially in California where more dwarf characteristics are especially beneficial.

Unique is a new bluegrass selection from an old turf area in Rhode Island. It's



In all seeding applications, local climate and field condition information, as well as knowing the varieties of seed available, are critical to success. Photo courtesy: Allan Roench, Gandy Company.

in the top 10 of the NTEP trials. It holds up well through the winter and has good overall disease resistance. It has compact dwarf characteristics, good color, and is dense and aggressive.

Pennington Seed, Inc., Madison, GA.

Ronnie Stapp, vice president

A new seeded bermudagrass will be available in 1994, right now code-named 886A. It's more dwarf than Cheyenne, with a very low growth habit. It's cold tolerant, quick to germinate, and a more prolific seed producer than most current varieties. Its color is darker than common bermudagrass. It's finer bladed than Cheyenne, but not quite as fine-bladed as the vegetative varieties.

A new turf-type tall fescue with the code name ITR90-2 has been in the Rutgers University development program. It's low-growing, though not quite as dwarf as Bonsai. It was highly rated in the NTEP trials last year. It's fine-bladed and very dark green. The company has high expectations for its use in sports turf and lawn areas, especially in the South.

Virtue is a turf-type tall fescue currently on the market. It's a fine-bladed grass with good dark color and overall attributes. It's being used primarily in commercial turf blends, including those for sports turf. It's making an excellent showing in Enviro-Blend with Tomahawk and Monarch across the fescue belt from California to the East Coast.

The new endophyte-enhanced perennial ryegrass Morning Start is in the 1993 Primo-Blend. It has insect and disease resistance, good color, and performed well in the NTEP trials.

Another new perennial ryegrass, code-named 2B3, is a possible leading variety for future years and should be in seed production by 1994. It's doing well in

NTEP trials and has especially good color.

Jacklin Seed, Post Falls, ID

Doug Brede, research director

Pixie turf-type tall fescue is an intermediate variety bred to be very dense, wear-resistant, and dark green. It's done fairly well against Brown Patch. In 1992, only samples of this variety were available.

Jackpot, a new seeded bermudagrass, will be available as seed samples this fall and as certified seed in the spring of 1994. It's the first seeded type bermudagrass that rivals vegetative types. It has a fine texture and is very dark green. It's not as cold-tolerant as those bred especially for cold-tolerance, but it's the equivalent of most vegetative types. It has improved resistance to Leaf Spot.

There are two experimental turf-type seeded zoysiagrasses on the horizon, currently code-named J-37 and J-38. Both are dense, finer textured, and darker green than the Chinese common now available. The excellent density of these seeded varieties makes them good candidates for sports turf use.

This is the first season for ample certified seed of NuStar bluegrass. This

medium-dark green variety was discovered thriving in an area of Washington that received only 10 inches of precipitation a year. It's been screened and found successful in both high- and low-maintenance situations, and is doing especially well on the East Coast. It shows good resistance to Leaf Spot.

O.M. Scott and Sons, Marysville, OH

Virgil Meier, in charge of research

Achiever perennial ryegrass was released in 1993. It has high endophyte insect resistance, fine texture, good density, and has performed well in the NTEP trials.

Adobe, a turf-type tall fescue, also has high endophyte insect resistance. It's an intermediate dwarf variety that retains excellent drought tolerance with fewer clippings.

The major attribute of Buckingham Kentucky bluegrass is its very dark green color. It blends well with other bluegrasses and with perennial ryegrasses to raise the color level of the turf. It's especially useful where aesthetics are important, as in a sports turf stadium.

Lofts Seed, Inc., Bound Brook, NJ

John De Matteo, turfgrass agronomist

Palmer II, Prelude II, Repel II, and

Yorktown III are all perennial ryegrasses which are especially good for sports turf use. These varieties have been on the market for one to two years. All have good, dark color, fine leaf texture, and are high in endophytes.

International Seeds, Halsey, OR

Craig Edminster, director of research

A new seeded bermudagrass variety, yet to be named, offered in cooperation with Arizona Grain Valley Seed Company and International Seed will be introduced this year. The variety is showing good potential for home lawns, sports fields, and golf fairways and roughs. It's not as dense as the vegetative bermudagrasses. It shows excellent seed production. It's cold-tolerant, thriving far north in the warm-season zone and well into the transition zone. It has an upright growth pattern, uniform texture, and excellent wear resistance. It's entered in the fall NTEP trials, with results expected over the next couple of years.

A new turf-type tall fescue, currently named APF, is also being developed in cooperation with Rutgers University. It has excellent turf quality and is wide-

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SEED

continued from page 13

ly adapted. It's fully endophyte-enhanced (85 to 90 percent) and has an excellent disease profile, especially against Summer Patch, Brown Patch, and Pythium.

Essence+ (plus) perennial ryegrass is being targeted for the Pacific Northwest, northern California, new England, and southern European markets. It is also endophyte-enhanced and has made an excellent showing against Stem Rust, Crown Rust, and Leaf Spot.

Seed Research of Oregon, Corvallis, OR

Skip Lynch, national technical representative

SR 8300 is a unique turf-type tall fescue from a different germplasm source than any other tall fescue on the market. It has a semi-dwarf growth habit, medium-to-fine leaf texture, rapid tillering, and shows both heat and drought tolerance. It has strong resistance to Leaf Spot and Stem Rust.

SR 4300 is an endophyte-enhanced perennial ryegrass that withstands insect and drought stresses. It's dense, dwarf-growing, and tolerates very close mowing.

Finelawn Research, Lake Oswego, OR

David Lundell, technical service

Stallion Select perennial ryegrass has high endophyte levels and disease resistance. It has fine leaf texture and excellent turf quality, and has done well in the last NTEP trials.

Finelawn 88 turf-type tall fescue is a semi-dwarf variety with fine leaf texture, good disease resistance, dark green color, and fast establishment.

A major introduction for sports turf fields is *Poa Supina*, a grass which originated in Germany and has proven to withstand the abuse of heavy play. It has good disease resistance under various management practices and shows resistance to Snow Mold and Dollar Spot.

P. Supina was used in various mixes — ranging from 5 to 30 percent of the mix with Chateau bluegrass, Stallion perennial ryegrass, and Pebble Beach perennial ryegrass — as a new planting on one of the practice soccer fields at Ohio State University in November 1991. To this point, the field has not needed overseeding. P. Supina is also in use at Wheaton College, Wheaton, IL, soccer field and the Chicago Bears practice field.



Pendulum seeder covers large areas with speed.

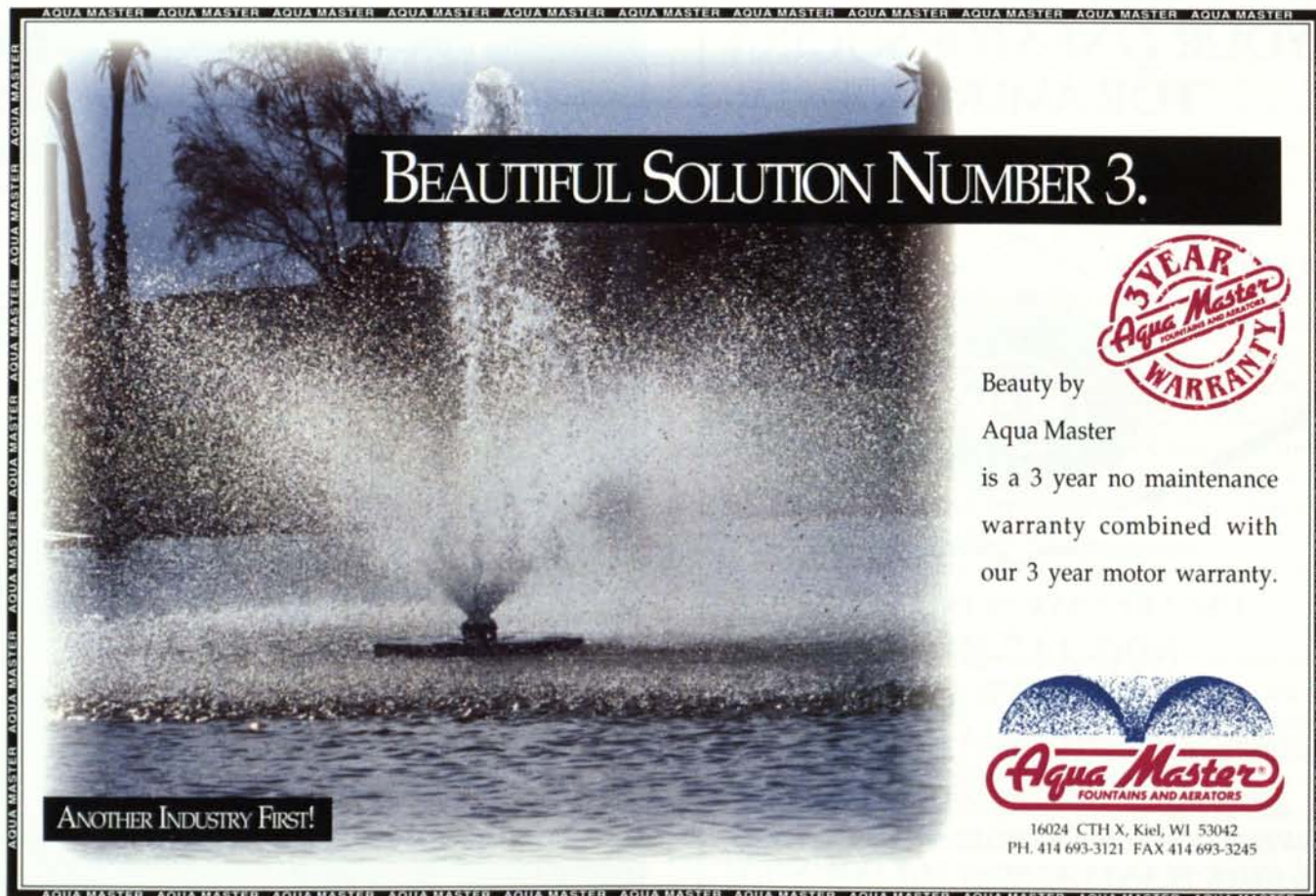
Photo courtesy: John Deere.

It's suggested that P. Supina be used as 20 percent of the mix for overseeding established fields. It can take a bit longer to become established in an overseeding situation than some of the other grasses, but once established, it handles the stresses of erratic weather and heavy wear extremely well.

Lesco, Inc., Rocky River, OH


Art Wick, vice president

New for the fall of 1993 is Advantage turf-type perennial ryegrass, an advanced generation cultivar with very dark



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blue-green color, fine texture, and excellent mowing qualities. It has a reduced vertical growth rate and reduced steminess during late spring and early summer. It's endophyte-enhanced (96 percent), with good resistance to above-ground feeding insects and improved overall stress tolerance.

Wildwood Kentucky bluegrass was selected from a golf course in western Pennsylvania for its aggressive, dark-green appearance following a six-week drought in 1988. It's very low growing, has a medium-fine leaf texture, and exhibits early spring green-up. It has good resistance to Leaf Spot, Dollar Spot, Stripe Smut, Leaf Rust, Melting Out, and Powdery Mildew. A limited supply will be available for demonstration purposes in the fall of 1993.

Research is continuing on low-growing, dark perennial ryegrasses, on perennial ryegrasses to provide improved transition in overseeded dormant warm season grasses, on improved high-endophyte creeping red fescues, and on high-endophyte tall fescues adapted to the south-eastern portion of the transition zone.

In 1994, Lesco will introduce an improved seeded zoysiagrass with earlier spring green up and an improved seeded bermudagrass with greater cold tolerance and earlier spring green-up.

Medalist America, Albany, OR

Eric K. Nelson, Ph.D.,

Director of turfgrass research

Sundevil seeded bermudagrass has dark green color, heat tolerance, and improved cold tolerance with reported winter survival as far north as Idaho. Its quick spring green-up provides improved recuperative potential for traditional spring sports in the South and transition zone.

Triple A is a blend of Amigo, Arriba, and Arid turf-type tall fescues that provides quick establishment, controlled vertical growth, and reduced mowing requirements. Amigo contributes wear tolerance and high overall trial ratings. Arriba adds broad adaptation, disease resistance, persistence, summer density, and dark green color. Arid brings broad adaptation and consistent performance.

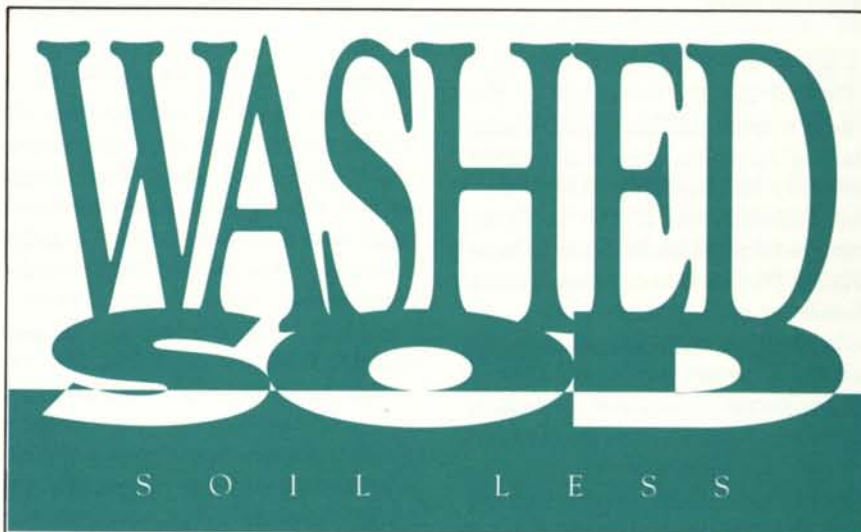
NuBlue Kentucky bluegrass joins the Triple A trio of turf-type tall fescues in the A Plus mixture to provide a denser, finer textured turf with improved recuperative potential.

Medalist X overseeding blend, containing Dandy, Target, and Mulligan perennial ryegrasses offers quick germination and establishment, wear tolerance, disease resistance, good density, medium dark green color, fine texture, and good spring transition.

Medalist Gold overseeding blend combines 50 percent APM, 25 percent Target, and 25 percent Dandy perennial ryegrasses for density, dark green color, fine texture, uniformity, and disease tolerance.

As a result of continual research, testing, and development at universities and seed companies, sports turf managers can select from a wide range of cultivars to tailor athletic turf to regional conditions and specific needs. □

Editor's note: As Extension Turfgrass Specialist with the University of Georgia, Dr. Gil Landry provides leadership in the development of statewide educational programs in turfgrass management. In addition, he serves as president of the national Sports Turf Managers Association.



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STMA Profile:

GIL LANDRY BUILDS PROFESSIONALISM THROUGH COMMITMENT

By Bob Tracinski

It takes only a minute of talking to Dr. Gil Landry to recognize that he's a true southern gentleman. Yet behind his soft southern accent and apparently relaxed demeanor lies a strong commitment to the turfgrass industry and an intense drive to bring the Sports Turf Managers Association to the forefront of that industry.

Ask anyone who knows Landry to describe him and you'll hear many of the same terms — intense, dedicated, energetic, hard-working, on top of things, and more. Those attributes are more than admirable; they're essential considering the many varied responsibilities he juggles as extension turf specialist for the University of Georgia and STMA president.

Part of his ability to handle so much comes from his commitment to turf. Landry is quick to point out that the turfgrass industry touches all of our lives in various ways.

If turfgrass happens to be growing in Georgia, it's Landry's responsibility. In his extension turf specialist role, he serves as the overall coordinator for all turfgrass management programs in the state. That covers turf from home lawns to golf courses.

Based at the university's Griffin, GA, facility, located just south of Atlanta, Landry puts on educational programs throughout the state, helps turfgrass managers solve their turf problems, and coordinates the programs for the state's Annual Turfgrass Conference and Trade Show and the biennial field day.

Landry serves as a resource person for county extension personnel, primarily in training to develop their expertise in turfgrass management and in the development of educational materials, slide

sets and presentation packages for local seminars.

Large Territory to Cover

Georgia is the largest state east of the Mississippi River, with 159 counties and 158 extension offices. Fortunately for Landry, the majority of those counties are rural, with little demand for the turfgrass assistance. The focus of his attention is around the urban centers, with the heaviest concentration in the metro-Atlanta area.

Still, with Savannah and Brunswick about 250 miles away, Landry does spend considerable time on the road. And he's not content to devote a trip to a single problem or agenda. On a recent trip to Savannah, he conducted a combination classroom and hands-on education session for 35 county agents from the part of the state, surveyed the turf at Cardinal Stadium, the Class A affiliate of the St. Louis Cardinals, and checked out the turf problems at the local golf courses.

Then there's the not-so-little project of the Annual Turfgrass Conference and Trade Show held each winter. Last year, more than 1,300 people attended and exhibitors filled the 48,000-square foot trade show area.

Just 10 years ago, the conference was strictly for the golf course industry. About that time, Landry moved to expand the program to encompass all of the Georgia turfgrass industry. Six years ago the conference was moved to Atlanta to draw a larger crowd and provide adequate room for trade show space. At the same time, the Georgia Turfgrass Association was formed as an umbrella organization for the industry. The conference was then cultivated as a profit maker to help support the association.

The conference, which prior to these changes could be organized by two to three



Landry: "Any association is only as effective as its leadership, and depends on the support, guidance, and involvement of members."

people, now requires three large committees to direct the facility arrangements, trade show, and educational faculty. Pre-conference workshops are held and the conference has expanded to include both general and concurrent sessions to accommodate all turf areas.

The University of Georgia, Georgia Turfgrass Association, and GGCSAA co-sponsor the conference. Allied associations, such as the Georgia Sod Producers Association, Georgia Irrigation Association, and Metro-Atlanta Landscape & Turf Association also support the program.

All of this rapid growth is connected in part to the rapid growth within the state. In conjunction with the expanding population, especially around Atlanta, the turf industry made comparable growth. Home lawns, golf courses, schools and parks, and recreation facilities sprang up everywhere.

"The university has done a good job of recognizing that growth and making accommodations to serve the people's needs," says Landry.

In 1979, when Landry first joined the University of Georgia as extension turf specialist, there were three full-time people in turfgrass research or extension and a total of six people involved in some facet of the program. Today, there are still three full-time positions, but there are now 13 faculty people involved with the turfgrass program.

But, as Landry says, "Everything is cyclical." In 1991, the state had mandated a balanced budget due to the economic slowdown, and resolved to trim the extension service by 44 percent. "The governor had even announced where the budget cuts should be — and one of them was my position," Landry explains. "But because of the response from the people of the state and in the industry, that recommendation in that proposal was reduced by 28 percent."

Still, the extension service was trimmed by 130 positions."

As it happens, at the same time the budget-cutting moves were taking place Landry was being elected president of the national STMA. "It was one hectic week," says Landry, now serving his second term with the organization.

His involvement with STMA was a natural. He's always enjoyed sports and played baseball, football, and basketball throughout high school. In his present university position, he became aware of STMA and its activities through the former field manager for the Atlanta Braves. Always looking for additional sources of quality information, Landry became a member.

"Before I knew it, I was on the board," he says. "Then I served as secretary for two years. In 1991, during a period of rapid changes in the organization, I became president by default — on one else could devote the time to the job." Landry's "spare time" was a boon to STMA — his strong leadership was just what the organization needed during the transition period, as other officers and board members are quick to point out.

Since then, STMA has made considerable strides. "STMA has cleared every hurdle placed in front of it these last two years," says Landry. "Renewal of memberships has been better than ever in 1993, and total membership is showing growth — but never as fast as we'd like it to be."

Even with all Landry's experience with other organizations, he's been surprised at the amount of time and money it takes to maintain an organization like STMA, much less to initiate new ideas and activities and do the necessary promoting.

"I don't think the membership really knows what the board has to juggle," he says. "Any association is only as effective as its leadership, and its leadership's effectiveness depends on the support, guidance, and involvement of the individual members. As with any volunteer organization, it's vital that the members take on challenges and then carry through with what they have committed to."

Building a Born Leader

Landry learned about commitment at early age. He grew up on a farm in Louisiana, and helped his father with



In addition to his other responsibilities, Landry puts on educational programs throughout the state.

crops and livestock. He watched his mother, a registered nurse, turn into a community activist to initiate educational programs to assist his retarded older sister and others with limited capacities. He and his two other sisters picked up on the positive image and developed a "pitch in to make things happen" attitude.

Landry attended Louisiana State University. After starting out in premed, he settled into the general agriculture curriculum with an agronomy major and a focus on soils and soil chemistry. After earning his masters, he was offered a position to go for his Ph.D. and completed his doctorate in three years.

He then taught agronomy at McNeese State University in Lakes Charles, LA. After two years he decided that classroom teaching was not for him and that he didn't want to concentrate on "traditional agriculture," he joined the University of Georgia in his present position in 1979. His first 10 years were spent in Athens at the main campus, where in addition to his current responsibilities he was in charge of maintaining the 10 acres of turfgrass research and demonstration area. "It's the nature of an extension position to juggle lots of responsibilities," he notes.

Landry says when he looks back over the last two years his most enjoyable experiences have been in connection with STMA activities, and he is quick to credit other STMA members with the continuing success of the organization.

"My terms as president have been a lot easier because President-elect Greg Petry has put in as much time and effort as I have, and Executive Director Bret Kelsey has been dedicated and easy to work with," says Landry. "Other board members and committee members also have chipped in. I really appreciate the assistance of Dr. Henry Indyk. He's done a tremendous job as co-chair of the national conference with Greg Petry. Jim

Watson, Steve Cockerham, and Steve Wightman have always been willing to provide time, suggestions, and help to deal with tough issues.

"My wife has been very understanding and supportive of my commitment to STMA," he adds.

Landry believes that any association governed by a board becomes a democratic body when there are many views of what needs to be done. "Compromises must be worked out that are palatable to the majority and meet the basic needs and agenda of the group," he explains. "Though everyone comes from their own realm and brings their own viewpoint to the table, the good of the organization is the driving force."

Landry doesn't admit to any pet peeves. However, he does have a "common irritant." "It bothers me that people ask what they will get from STMA," he says. "Certainly the burden is on the association to provide educational opportunities and materials, but I feel individuals should ask themselves, 'What can I do for the organization?'"

"The main challenge of the turfgrass industry in general, and sports turf managers in particular, is the development of professionalism and the identification and acceptance of the responsibility that comes with being a professional. If anyone is working in the turfgrass industry and intends to be involved for more than a year or two, they should become involved in a professional organization. STMA offers the best opportunity for people in the sports turf industry for professional improvement. At the same time, association leadership recognizes the challenge that comes with that and is trying to do what is necessary to make STMA even more valuable and challenging for sports turf professionals."

Landry sees excellent long-range potential for STMA. "There's no reason that STMA can't develop as the Golf Course Superintendents Association of America has, with a broad-based, active, professional membership," he concludes. □

Editor's note: Bob Tracinski is the manager of public relations for the John Deere Company in Raleigh, NC, and public relations chairman for the Sports Turf Managers Association.



Any system in an area with freezing and below freezing temperatures during the winter is susceptible to damage from the cold. Photo courtesy: The Toro Company-Irrigation Division.

Putting Irrigation Systems to Bed for the Winter



Irrigation systems should be winterized before the first freeze. Photo courtesy: Rain Bird.

By Jeff Uleman

As temperatures drop toward freezing in many areas of the United States, it is time to get irrigation systems ready for their "winter sleep." Systems must be completely drained and shut down to prevent damage caused by freezing water on the system components. Similar procedures are followed for new installations and for repairs that require system drainage.

Getting Started

Use a two- or three-person team to winterize an irrigation system. One person must constantly watch the system to ensure that all heads spray air during the blowing out procedure.

Always keep safety in mind. To prevent injuries, keep all personnel from standing directly over any commercial or large turf sprinkler as it is activated. Never attempt to disassemble the system while it is under pressure.

Serious damage can occur to system components if improper methods are used. The following general winterization steps apply to large park, athletic complex, and golf course irrigation systems. However, it is wise to review the instructions for *your own system* before tackling these procedures. For first-time winterization, check with an irrigation specialist on any particular concerns. Often, an irrigation specialist will provide a hands-on learning session.

Backflow Device Protection

The most sensitive part of the irrigation system is the backflow preventer. If this device is exposed to freezing weather conditions, it must be covered or drained before freezing temperatures arrive. When temperatures fluctuate, with a few cold days scattered among relatively mild ones, temporary covering of a backflow preventer with heat-keeping materials such as straw may keep it warm enough to protect it from freezing and cracking.

On many commercial installations, backflow preventers are kept within a heated building for year-round protection. If the backflow preventer is in a building that is not heated, it must be monitored closely. When in doubt over the degree of protection to provide, *winterize*. It only takes a hairline crack to completely destroy a unit.

Step-By-Step

For complete winterization, first turn off the water by closing the main water supply valve.

If the system has automatic drains, use them to evacuate water. If the system does not have automatic drains, it must be "blown out" with compressed air from an air compressor. Keep the pressure regulator adjusted to 50 psi or less. Higher pressures could damage pipes and connections.

To achieve the volume of air necessary to blow out large systems, you may need to use two or three air compressors with 185 cubic feet per minute capacity. For

large irrigation systems, a high-volume air compressor will be needed. Excessive heat will be generated at the point of air connections to the system. To avoid damage to PVC piping systems, use a length of 1-1/2- or two-inch galvanized pipe to dissipate the compressor heat prior to entering the irrigation system piping.

Air connection points made at the highest locations on main lines will permit water removal by air volume (CFM) as opposed to pressure (psi). Set the psi at the lowest possible pressure that will adequately remove water from the system.

Open drain valves and/or quick coupler valves at the far end of the system. When all water has been drained, leave the drain valves open and remove the quick coupler. Then, turn on one valve in the system, activating it manually from the controller. If it doesn't activate, more air is needed. The heads should operate just as they do when the system is watering. While the valve is turned on, the heads will begin to blow air instead of water. In this manner, evacuate water from one head or zone at a time, starting with the heads closest to the compressor. Electric valve-in-head and hydraulic normally-closed systems require a minimum air pressure of 35 psi at the head to activate the valve and may require additional time to open. When all of the heads blow air, turn off the valve and move to the next valve.

After the entire system has been cleared of water, repeat the process to

ensure all water has been evacuated from the system. This eliminates any pockets where water may have settled during the first evacuation process.

Next, insert the key into the quick couplers and blow them out as well. Then take the air compressor off the system.

Remove the backflow preventer and take it inside to a warm spot, or open all the vents and all the ball valves so they are one-half open and one-half closed. The tolerance on the ball valves is so tight that it can trap water between the ball and valve assembly. Though the amount of water that collects during the running of the system may be extremely small — the tolerances are so close that a little bit of water will expand as it freezes and cause cracks.

Within the system, there will be a drain located just beyond the shut off valve. Ease the drain open after the system has been drained. If the shut-off valve malfunctioned, even a small trickle of water could refill the system over a period of time. This accumulation of water could freeze, cracking the system, without the problem being noticed. If the drain is left open, any leak will be apparent.

Next, check the controller. Many controllers are equipped with heat resistors designed to generate heat within the timing mechanism compartment. In most areas of the country, this heat will prevent condensation and rust formation during winter shutdown. If this is the case, leave the AC power on at the controller and disable the timing mechanism by placing the switch in the manual position.

For controllers without heat resistors, it may be sufficient to simply turn them off, depending on the conditions where the unit is placed. Because no water passes through controllers, it is not necessary to protect them from freeze-thaw cycle, just from condensation. Check with an irrigation specialist to ensure proper procedures for "winterizing" your controller.

Hot Tips for the Cold

Don't try to rush the winterization process. The steps must be completed in the proper order.

Take precautions. Be on the lookout for the most common problems.

Make sure all quick couplers are completely blown out. Find all hidden couplers.

Leave the drains open. Leave the backflow devices one-half open.

Act early in the season. Taking care of a backflow device after the first unexpected freeze is too late. If a system can't be adequately prepared before the first freeze, another alternative is to run it. Moving water can take far lower temperatures without freezing.

Underground systems have more built-in natural protection than above-ground systems. Because the ground retains heat much longer than the air, it takes an extended cold period for soil temperatures to drop to the danger level. Still, any system in an area with

freezing and below freezing temperatures during the winter is susceptible to damage from the cold. Winterizing is your system's best defense. □

Editor's note: Jeff Uleman is president of Uleman Enterprises, Inc., in Elkhorn, NE. He worked closely with national Sports Turf Managers Association board member Jesse Cuevas on the design and installation of the irrigation system for Rosenblatt Stadium in Omaha, NE, and he provides maintenance on that system.

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Snow Mold Identification and Management Strategies

By R.T. Kane

Northern turf managers should begin planning early for winter disease control. Of primary concern are so-called “snow molds” — a group of fungi that attack dormant or near-dormant turf at or near freezing temperatures. Snow molds occur under snow cover or in cold, rainy periods of late fall and early spring. Although persistent snow cover is not required for all pathogens in this group, prolonged snow cover increases mold severity, especially when snow accumulates on unfrozen ground.

Snow mold damage is often more significant on intensively managed fine turf areas such as golf course greens and tees. Also, bentgrasses and *Poa annua* are more susceptible to snow molds than Kentucky bluegrass, ryegrass, and fescues. Most turf managers have a good handle on their snow mold control requirements, since these diseases tend to reappear yearly in the same areas (depending on weather conditions).

Snow Mold Identification

It is important to be able to differentiate between the types of snow molds, since more than one disease can occur at the same site, and control measures may vary in effectiveness for each disease. In the upper Midwest and most of the Northeast, there are two primary types of snow mold: Typhula blight (gray snow mold, speckled snow mold) and Fusarium patch (pink snow mold).

Fusarium patch/pink snow mold is characterized initially by small circles of water-soaked grass that may subsequently turn yellow, orange-brown, or reddish-brown. Patches two to four inches in diameter may have a gray or reddish-brown border if the disease is actively spreading.

Fusarium patch usually occurs during cool, rainy periods in spring and fall when temperatures are between 40 and 60 degrees F. In northern areas, Fusarium patch can occur well into June and reappear in September or early October.

When this disease occurs under snow, somewhat different symptoms may be observed and the disease is often referred to as pink snow mold instead of Fusarium patch. Under snow, somewhat larger patches (six to eight inches) may develop wherein the leaves are matted and covered by fungal mycelium. When sunlight hits the diseased tissues at snow melt, the mycelium and infected leaves turn a pink to coppery red color. Thus the “pink snow mold” name is used.

It is critical to remember that both symptom types are caused by the same fungus and are actually just different expressions of the same disease. The fungus *Microdochium nivale* (formerly *Fusarium nivale*) is the cause of Fusarium patch/pink snow mold. *M. Nivale* can be confirmed microscopically by its abundant production of colorless, crescent-shaped spores that are formed in salmon- or peach-colored structures called sporodochia. In some cases, sporodochia can be observed with a hand lens, especially when they form in distinct rows in leaf stomata. These spores are the primary means of spread of the pathogen, via wind and rain splashing, and on feet and equipment.

Gray snow mold/Typhula blight is caused by the fungus *Typhula incarnata*, which is physiologically adapted to grow and infect at freezing temperatures. Snow cover is usually required for significant disease development. Symptoms of gray snow mold are most distinctive if seen while the disease is active, which would be at or just after snow melt. Symptoms include white to grayish brown, roughly circular patches of four to eight inches in diameter. Larger irregular shapes may occur when patches coalesce or environmental conditions favor prolonged fungal activity. White to gray fungal mycelium may be seen matted on diseased foliage. Also, close inspection may reveal fungal structures called sclerotia imbedded in decaying leaves. Sclerotia are roughly spherical,



Gray snow mold. Photo courtesy R.T. Kane.

approximately one to five millimeters in diameter, and can be various shades of orange to brown. Sclerotia serve as survival structures of *Typhula* during the summer months.

Another form of Typhula blight is caused by the fungus *Typhula ishihariensis*. Symptoms are similar to gray snow mold, but this fungus forms very small, black sclerotia snow mold. Formation of sclerotia is useful in separating Typhula snow molds from *Microdochium nivale*, which does not form sclerotia.

Snow Mold Control Options

Fungicides. On intensively managed, high value turf such as golf greens, snow mold prevention via fungicide application has long been the standard practice. The most commonly used fungicides are those containing mercury (Hg) in the form of mercuric chloride or phenyl mercury acetate (PMA). These are restricted use products labeled only for greens and tees. Hg fungicides provide the highest level of snow mold control at relatively low rates, and with residual activity to last through the winter.

However, products contained Hg have been banned in several states and are the target of regulatory action by the Environmental Protection Agency. Recently, manufacturers suspended production of some Hg-based fungicides and/or have withdrawn registration. Once existing stocks of these fungicides are sold out, there will be no more product available. This is especially disconcerting news to turf managers in the northern tier of states where snow mold pressure is greatest.

There are a number of good alternatives to Hg fungicides, but the level and length of control may not be as great, even at high application rates. The cost of control presumably will be higher as well.