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CUTT

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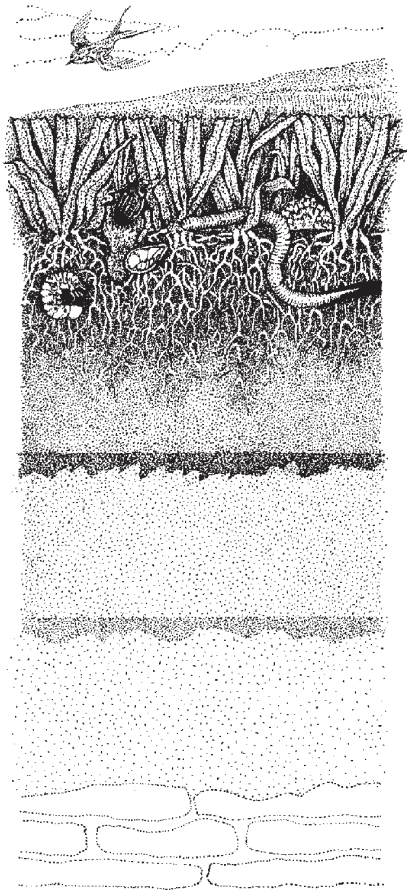

Selecting Turfgrass For Low Maintenance Sites

Economic and environmental concerns have convinced many turf professionals of the need to reduce turf management inputs. While high maintenance is often necessary on sports turf and highly visible residential, commercial and institutional lawns, there are many other sites that could require as much as 50 percent less fertilizer, water and mowing if the proper species and cultivars were established. ■

Demonstration Trial

In 1992, Cornell Cooperative Extension of Monroe County began a demonstration trial that included readily available seed mixes and blends for low maintenance qualities. Local seed dealers were requested to submit low maintenance grass seed mixes or blends for evaluation. A total of eight were submitted, as listed in Table 1. Planting was done in late May. Standard seedbed preparation procedures were followed. Phosphorous was incorporated at a rate of 4 lbs. per 1000 sq. ft. A starter fertilizer was applied at seeding and again at six weeks after germination at a rate of 1 lb. of N per 1000 sq. ft. A portion of each plot was not treated with the second application of starter fertilizer. This was done to demonstrate the impact of a second application on seedling establishment.

Areas receiving only the first fertilizer application established at a much slower rate. This resulted in reduced turf densities and increased weed infestations which were clearly evident 15 months after seeding. Optimal seedbed fertility levels, provided that other site conditions are favorable, are critical to successfully establish turfgrasses. While low maintenance grasses may require fewer inputs once they are established, they should not be neglected in the seedling stage.

Reducing Costs

During the first season of growth, precipitation was abundant and temperatures were ideal for sustaining prolific growth. While it was not a good year to evaluate for drought tolerance, conditions were excellent to assess mowing needs. Of all management inputs, mowing can be the most expensive: costs can account for as much as 60% of a seasonal turf maintenance budget. If conditions are warm and wet, figures may range from $150 per acre (72" mower, 3 mph, labor cost $7.00 per hr.) to $462 per acre (22" mower, 3 mph, labor cost $7.00per hr.). Large commercial, institutional or municipal grounds represent the lowest costs relative to higher cost sites like residential lawns and golf course greens. So besides mowing faster and using bigger mowing equipment, how can one reduce costs?

Slower growing species and cultivars are the best answer. When maintained properly, that is with reduced levels of nitrogen and irrigation, they will free up money in a turf management budget. In recent years, there have been tremendous improvements in some of the slower growing species including: chewings, sheeps and hard fescues.

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Short Cutts

Cornell Education Programs Successful

Two major educational programs were co-sponsored by the Turfgrass Science Program at Cornell and the New York State Turfgrass Association this summer. On June 10, over 400 turfgrass managers from around New York State attended the Turfgrass Research Field Day. Attendees saw updates on several research projects in weed science, pathology, turfgrass management, water quality, and others. A highlight of the day was the presentation of a $45,000 check by Mike Maffei, President of NYSTA, to Cornell in support of turfgrass research. Ronnie Coffman, the director of research in the College of Agriculture and Life Sciences at Cornell accepted the check. These monies were placed in the Turfgrass Foundation. The research office matched those funds, distributing them to the individual researchers.

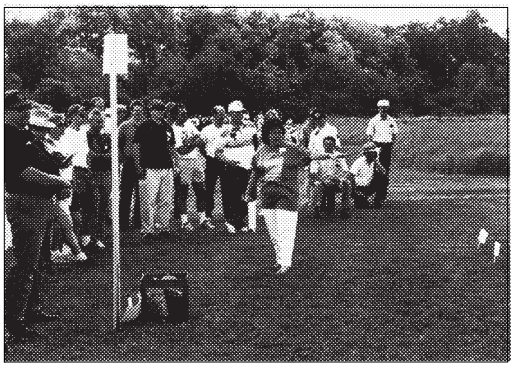
Mike Maffei, President of the New York State Turfgrass Association (second from left) presents a $45,000 check to Ronnie Coffman, Director of Research at Cornell's College of Agriculture and Life Sciences (far left). The money will support turfgrass research. Looking on are Pete Hahn (second from right) and John Liburdi (far right).

In August, about 15 individuals participated in the Turfgrass Diagnostic Course. This years's course was geared for lawn care and institutional grounds. Much time was spent in the field, including one lawn where students found grubs, sod webworms, chinch bugs, billbugs, and summer patch. The lawn care contract on that house has probably since been canceled. Next year's diagnostic course will focus on golf course pests. For more information on turfgrass educational opportunities at Cornell, contact Joanne Gruttadaurio or Angelica Hammer at 607-255-1789.

New York State Turfgrass and Landscape Expo

The program has been set for the 1993 New York Turfgrass and Landscape Exposition. Held once again at the beautiful Rochester Riverside Convention Center, this year's show will be held on November 9-12. Features on the program include: for golf course people, a session on bunker renovation and construction, featuring Ron Whitten, architecture editor for *Golf Digest.* The grounds maintenance and lawn care sessions will have plenty of pest management topics, with speakers from Penn State, Longwood Gardens and the BioIntegral Resource Center. The keynote speaker is Lou Piniella.

This year's trade show promises to be the biggest and the best in the Northeast. Plan now to attend the most informative educational and trade show ever. For more information, call Beth Seme at 800-873-TURF.



Joanne Gruttadaurio leads a session of the Turfgrass Field Day at Cornell.

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Do Endophytes Enhance Drought Tolerance?

Do endophytes enhance the survival of water stressed tall fescue? That was the question addressed by researchers from North Carolina State and Texas A&M Universities. It is known that the presence of endophytes in tall fescue will confer resistance to insect pests, enhance growth, and improve tall fescue persistence under high temperature. Three cultivars of infected and non-infected tall fescue were subjected to water stress. Few plant parameters related to water stress were affected by the presence of the endophyte. Total tillers, tiller survival, plant survival, and recovery weights were similar for endophyte-infected and endophyte-free cultivars. Therefore, there was no evidence of endophyte mediated drought tolerance in this study.

(From: R.H. White, M.C. Engelke, S.J. Morton, J.M. Johnson-Cicalese, and B.A. Ruemmele. 1993. Acremonium Endophyte Effects on Tall Fescue Drought Tolerance. Crop Science 32:1392-1396.)

Urease Inhibitors to Increase Nitrogen Efficiency

A major loss of nitrogen from surface applications of urea fertilizer is through volatilization, or gaseous losses. Urease is an enzyme that occurs naturally in the soil that breaks urea down into carbon dioxide and ammonia gas. This must occur for the urea nitrogen to become available. If this breakdown can be slowed down, perhaps less nitrogen will be lost to the air. Researchers in Iowa have been looking at chemicals that inhibit urease activity for reducing gaseous loss of urea nitrogen. In greenhouse experiments, they found that nitrogen losses from volatilization were as high as 49% of the applied nitrogen within a week after application. The inclusion of a urease inhibitor reduced the losses down to as low as 20%, depending on the material and rate. In field trials, however, they found little difference between straight urea applications, and where a urease inhibitor was included. The researchers concluded that these materials still have potential, but that more research is needed.

(From: Y.K. Joo, N.E. Christians, G.T. Spear, and J.M. Bremner. 1993. Evaluation of Urease Inhibitors as Urea Amendments for Use on Kentucky Bluegrass Turf. Crop Science 32:1397-1401.)

Natural Preemergence Weed Control

Preemergence herbicides are commonly used on turfgrasses to control annual weeds, including crabgrass. Iowa State researchers have conducted studies in the past that have shown that corn gluten meal contains a substance that inhibits root formation in certain grass species, including crabgrass. Used as an animal feed, corn gluten meal contains about 10% nitrogen, so it can be considered as a natural organic fertilizer as well. Control was better when the material was applied one week before germination. Much higher rates were required to obtain crabgrass control when applied four weeks before germination. The highest rates of corn gluten meal provided up to 95% control of crabgrass, when applied one week before germination. A patent was issued a couple of years ago on the use of corn gluten meal as a preemergence herbicide. Marketing agreements are under negotiation.

(From: N.E. Christians. 1993. The Use of Corn Gluten Meal as a Natural Preemergence Weed Control in Turf. International Turfgrass Society Research Journal 7:284-290.)

Scanning the Journals

A review of current journal articles

Few plant parameters related to water stress were affected by the presence of the endophyte.

In greenhouse experiments, inclusion of a urease inhibitor reduced nitrogen losses. In field trials, little difference was found.

The highest rates of corn gluten meal provided up to 95% control of crabgrass, when applied one week before germination.

Selecting Turfgrasses

continued from cover

In 1992, Cornell Cooperative Extension of Monroe County began a demonstration trial that included readily available seed mixes and blends for low maintenance qualities.

Of all management inputs, mowing can be the most expensive. So besides mowing faster and using bigger equipment, how can one reduce costs? Slower growing species and cultivars are the best answer.

Tall fescue and perennial ryegrass had the greatest mowing requirement.

Many cultivars of these now contain endophytes that give resistance to chinch bugs and sod webworms. Additionally, many cultivars have demonstrated resistance to important fine fescue diseases like: Drechslera leaf spot, red thread, pink patch and summer patch. While the fine fescues have reduced mowing needs, other species often grow vigorously and require as much as three times more mowing.

Trial Findings

In our trial, it quickly became apparent that seed mixes containing perennial ryegrass had very fast growth rates. A mix of dwarf tall fescue was equally fast. Compared to the mixes exclusively containing fine fescues, these produced from two to three times the quantities of clippings. Figure 1. illustrates the average clipping yields, per mowing, for each mix. The highest yielding mixes would have required two mowings per week while the lowest would have required one mowing every nine days. Considering this, if mixes with the highest frequency cost $150 per acre, the lowest would have cost about $50. Combined with a need for only about one third of the fertilizer, the total savings would be about $120/acre. If you were managing 100 acres, the total savings would add up to $12,000 a season.

The results of this trial represent only one year of evaluation. While some of the mixes had relatively high clipping yields, the effect of dry conditions and low fertility will probably alter the composition of species and cultivars within each mix. The biggest question yet to be answered is whether the mixes containing perennial ryegrass will shift to higher proportions of fine fescues. This would reduce their mowing needs.

Recommendations

There are many biotic and abiotic variables that impact seedling survival—including competition with themselves. After seeding, it is difficult to predict exactly what the final result will be. Given the quick germination and aggressive seedling nature of perennial ryes, it would be prudent to at least minimize their percentages in low maintenance mixes. If a significant population of perennial ryes are present, mowing needs will be high. Our blends of dwarf tall fescues and Kentucky bluegrasses also demonstrated high mowing needs. Considering this and the need for reduced fertilization and irrigation, mixes containing exclusively fine fescues are probably the best choice for low maintenance and/or ecologically sensitive sites. Since many communities are struggling with the solid waste disposal issue, seed mixes and blends should be evaluated for mowing needs.

James Willmott,
Cornell Cooperative Extension of Monroe County

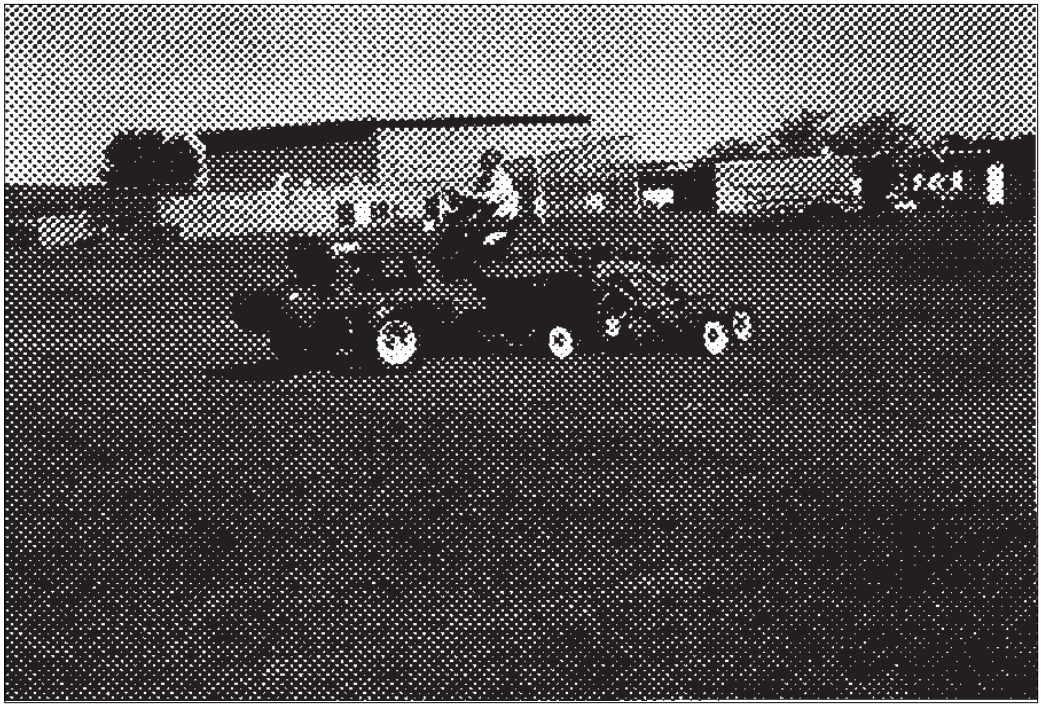


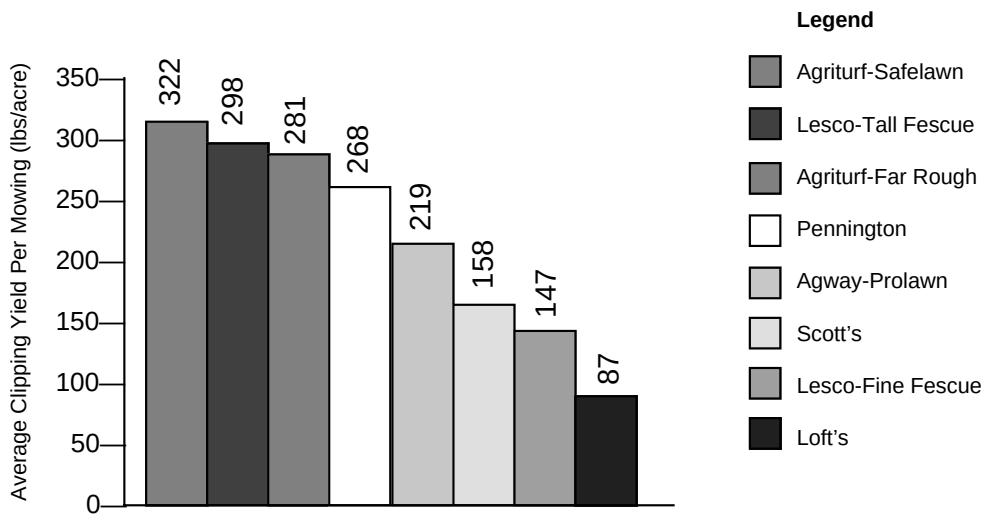
Table 1. Low maintenance turf mixes/blends.

				Fine Fescues			
Mix Name	**Perennial Ryes**	**Kentucky Bluegrass**	**Tall Fescue**	**Sheeps**	**Chewings**	**Hard**	**Creeping**
Agriturf Far Rough	Champion 19.81%	Touchdown 9.87%		Bighorn 29.26%		SR3000 39.59%	
Agriturf Safelawn/Crusader	SR4200 49.19%				SR5000 24.88%	SR3000 24.51%	
Agway–Prolawn Monroe County Low Maintenance Mix	Manhattan II 14.80%	Merit 14.85%			Koket 19.61%	Spartan 24.64% Aurora 24.44%	
Scott's Perfect Choice For Shade		Bristol 15% Coventry 15%			Banner 30%	Brigade 40%	
Pennington Drought Tolerant Bluegrass		Newport 43% Kenblue 43% Huntsville 9%					
Lesco Fine Fescue Links Blend				9.77%	Shadow 19.79%	Spartan 29.76%	Shademaster 39.64%
Lesco Compact Dwarf Tall Fescue Blend			Trailblazer 39.82% Trailblazer II 29.93% Shortstop 29.85%				
Loft's Ecosystems Ecology Mix					Jamestown 19.60%	Crystal 39.20% Reliant 39.20%	

Given the quick germination and aggressive seedling nature of perennial ryes, it would be prudent to minimize their percentages in low maintenance mixes. If a significant population of perennial ryes are present, mowing needs will be high.

Mixes containing exclusively fine fescues are probably the best choice for low maintenance and/ or ecologically sensitive sites.

Figure 1. Low Maintenance Blends/Mixes Clipping Yields



Late Season Fertilization

IPM Corner

Make your fertilizer application when you are sure that all growth has ceased, but well before the grass goes dormant. In New York State, this period runs from late October to late November.

One of the most important tools for maintaining pest free turf is a sound fertilization program. What better time to fertilize a turf area than in the late fall?

In the late season, when temperatures are consistently below 50˚, the grass stops growing. You know when this happens because you no longer need to mow. The grass plants are still green though, actively carrying on photosynthesis. Since the leaf tissue is no longer growing, its need for the sugars produced by photosynthesis is diminished. These sugars can then be transported to the crown, roots, rhizomes, and stolons where they are either utilized to produce new growth, or stored.

A properly timed fertilizer application, then, will promote this sugar production to the advantage of the underground plant parts. Benefits of a late season fertilizer application include early spring green up, but without the flush of growth normally associated with an early spring fertilization. There have been some reports of less leaf spot in the spring as well.

Timing is Important

It is important that the fertilizer be applied at the proper time. Applying fertilizer too early will force succulent growth, making the turf more susceptible to winter diseases and low temperature kill. If the fertilizer is applied too late, the benefits of the late season application will be minimized, if not negated all together. Make your fertilizer application when you are sure that all growth has ceased, but well before the grass goes dormant. In New York State, this period runs from late October to late November, depending on your location.

Late season fertilization improves winter and early spring color. Plot in right center did not receive late season fertilization.

Fertilizer Selection

The fertilizer you use in a late season application will impact its success. It is important that the nitrogen you apply to turf in the late fall be quickly available. Fertilizers that require microbial activity to release nutrients are ineffective at this time because of the cool soil temperatures. This eliminates natural organic fertilizers and most urea-formaldehyde products.

Water soluble or quick release fertilizers contain nitrogen in a form the plants can readily take up. Therefore, the nitrogen is available regardless of soil temperature. Fertilizers that contain urea, ammonium nitrate, potassium nitrate, ammonium sulfate, or ammoniated phosphates are well suited for a late season fertilization. Water soluble forms of nitrogen such as these are excellent choices for late season fertilization. In areas prone to leaching, however, you should consider a slow release nitrogen source.

Of the slow release sources, IBDU is best suited for a late season application. Release of nitrogen from IBDU is dependent on hydrolysis, so temperature dependency is minimal. It is best to use IBDU in a formulation with soluble sources since the initial release of IBDU tends to be slow.

Other fertilizers to consider in order of preference include soluble methylene ureas, such as Coron, short-chained methylene ureas products such a Nutralene and Scotts, and sulfur-coated urea. Polymer coated products have shown temperature dependency, so they would not be a good choice in the late fall.

Other Nutrients

There is an old spouse's tale that is perpetuated year to year that phosphorus should be included in a late fall or winter fertilizer. Perhaps it comes from the idea that roots are formed in the fall and that phosphorus helps rooting. Regardless of where this thought originated, there is no scientific documentation that phosphorus in a late season fertilizer does any good. It probably does no harm, especially if your phosphorus levels are low. It is best to apply phosphorus on the basis of a soil test.

Potassium has been shown to improve the winter hardiness of some grasses. Like phosphorus, potassium applications should be made based on a soil test. In lieu of a soil test, there should be about half as much K_2O in a late season fertilizer as nitrogen.

Late Season Herbicides

Do you have a difficult time getting your preemergence herbicides applied in time in the spring? If so, you may consider a late season application. As reported in last winter's CUTT (Vol. 3 #4), late season applications of Pendimethalin and Ronstar were equally as effective as a spring application in two of three years. Ronstar is in fact labeled for late fall applications for crabgrass control. Fall applications of Team and Dacthal were not as effective as spring applications.

Get your turfgrass areas off to a healthy start next spring by fertilizing this fall.

Norman W. Hummel, Jr.,
Dept. of Floriculture and Ornamental Horticulture

Cornell Cooperative Extension's Turfgrass Management Short Course

Since the first Cornell Turfgrass Management Short Course was held in January of 1986 more than 450 professional turfgrass managers from New York, New Jersey, Connecticut, Delaware, Pennsylvania, Maine, Massachusetts, Vermont, California, Wisconsin, Colorado, Canada and France have graduated. Forty instructors and assistants from Cornell University, SUNY Agricultural and Technical Colleges and the Turfgrass Industry are involved in teaching the lectures and laboratories. Class enrollment is limited so that laboratory sessions can maximize hands on experiences.

The 2-week long Short Course includes 75 teaching hours, covering the principles of turfgrass establishment and maintenance. Topics include grass morphology, identification and selection, soil science, drainage, irrigation, fertilization, cultivation, renovation; and pest management topics, (including identification and control strategies for insects, diseases and weeds). Other topics that help develop turfgrass professionals include: the selection, establishment and maintenance of ornamentals; developing budgets, communication skills, customer relations, motivation in management, and turfgrass management strategies. Daily student evaluations are collected and summarized to help improve subsequent Short Courses. A pass/fail final exam is given at the end of the course to assess achievement of the course's educational goals from both the instructor's perspective as well as from the student's perspective.

The Cornell Turfgrass Science Program promotes continuing education and maintains contact with past graduates throughout the year at regional and statewide Cooperative Extension and industry sponsored educational programs and conferences. According to our graduates:

"The Cornell Short Course experience has made a positive impact on their job performance and in their careers as turfgrass managers."

For more details contact Joanne Gruttadaurio, Short Course Coordinator, at (607) 255-1792. **Mark your calendar today: the Ninth Annual Turfgrass Management Short Course will be held January 10-14 and 17-21, 1994.**

Cut out or copy this form

REGISTRATION FORM

Ninth Annual Cornell Cooperative Extension Turfgrass Short Course

Please complete and mail the form below to Angelica Hammer, 20 Plant Science Building, Cornell University, Ithaca, NY 14853.

Make your check of $500 payable to Cornell University. Class enrollment is limited. A cancellation fee of $50 will be charged to registrants who cancel after December 20, 1992.

Please submit one form for each individual and **please print clearly**.

Where would you like your student packet sent? ____ Home Address or ____ Business Address

Name: _____ S.S.# _____

Home Address: _____

_____ Home Phone: _____

Business Address: _____

_____ Business Phone: _____

Describe your **turfgrass experience** and **number of years** in the business: _____

_____

_____

Education:

High School: _____

2 year degree in: _____

4 year degree in: _____

Masters in: _____

Other: _____

My work deals with:

_____ Landscape maintenance

_____ Golf course maintenance

_____ Athletic fields and school grounds

_____ Lawn care

_____ Other: _____

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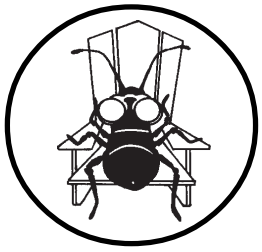

Pest Watch

Many cultural practices that you might implement in autumn may have severe impacts on snow molds in the spring.

Applications of Koban, Banol, or Aliette in mid-October to early November have proven effective in controlling root rot problems in the autumn, and reduce damage in the spring.

Snow Mold Diseases

Late autumn is the time to think about snow mold control strategies. In doing so, it is important to think of your overall management program and how that will impact on snow mold diseases.

Many of the cultural practices that you might implement in the autumn may have severe impacts on snow molds in the spring. For example, it is important to avoid heavy nitrogen applications prior to the cessation of top growth to avoid the production of abundant succulent tissue going into winter. Best results are obtained if fertilizers are applied in the autumn after top growth ceases. It is equally important to reduce the amount of snow cover if at all practical and to prevent compaction of the snow cover on disease-prone areas. Maintaining low soil pH (<6.0) and balanced soil fertility is particularly important in reducing pink snow mold damage

Applications of composted materials have been shown to reduce both pink and gray snow mold damage in the spring. Applications to sensitive areas of between 10 and 200 lbs. per 1000 sq. ft. have been effective. Make sure composts are adequately stabilized and have an 'earthy' odor.

A number of fungicides are effective in suppressing snow mold diseases. However, many are systemic and should be applied before winter dormancy. To be effective, these fungicides need to be translocated throughout the plant. Contact fungicides such as PCNB may be applied to dormant turf.

Eric Nelson,
Dept. of Plant Pathology

Pythium Root Rot Disease

Over the past few years, Pythium root rot has become one of the more serious diseases affecting all turfgrass areas, but particularly golf course putting greens. Should conditions become favorable (temperatures between 40˚ and 50˚ F coupled with prolonged wet conditions), severe outbreaks are likely to occur from September through November. Early to mid-autumn is the time to make preventive fungicide applications.

For sites with a history of root rot problems, applications of Koban, Banol, or Aliette in mid-October to early November have proven effective in controlling the problem in the autumn, but also reducing damage the following spring. With the exception of Koban, fungicides should be applied prior to winter dormancy and all should be watered-in for the most effective control.

Eric Nelson,
Dept. of Plant Pathology

Cornell Cooperative Extension

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