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EC79-1862 Nebraska Turfgrass Disease Control

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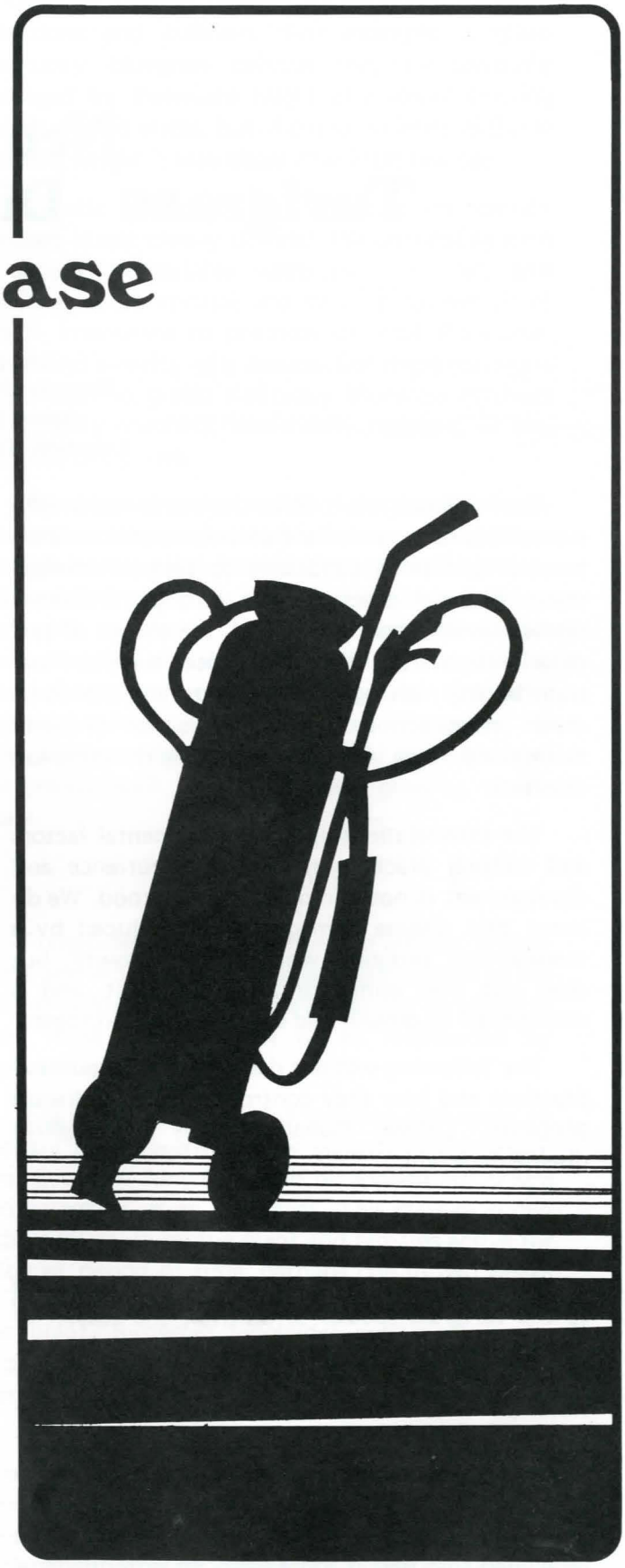
Nebraska Turfgrass Disease Control



Institute of Agriculture and Natural Resources

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Nebraska Turfgrass Disease Control

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Turf diseases result from the combination of a susceptible host, a virulent pathogen, and environmental conditions conducive to disease development. Cultural practices also strongly influence disease severity and, ultimately, the extent of turf deterioration from disease. Diseases such as Fusarium blight, melting out, and snow mold become much more serious when turf is not properly maintained (see pictures for eight common diseases).

The interrelationship of environmental factors and cultural practices to disease occurrence and development is not completely understood. We do know that disease damage can be reduced by a management program which favors growth, but does not over stimulate the grass plant, and is detrimental to growth and spread of the pathogen.

The following sections describe various cultural practices and how they control or promote disease problems. Careful management is an effective disease deterrent.

IRRIGATION

The amount of water needed varies according to the turfgrass species or cultivar, the season of the year, location, climate, intensity of culture, and use. About 1.5 to 2 inches (3.8 to 5 cm) of water per week are required to maintain a desirable turf during the summer months in Nebraska. Water deeply and infrequently to encourage the plant to develop a deep root system. Light, frequent watering encourages a shallow root system and a weakened turf that is more likely to suffer damage from melting-out and Fusarium blight.

Early morning hours (4 a.m. to 8 a.m.) are the best for watering. Avoid watering during the evening. Leaf spot, dollar spot, rust, strip smut, and Fusarium blight are diseases that may develop rapidly when grass blades are continuously wet for six or more hours.

The application of a light amount of water for a brief period reduces the temperature of the turf and the soil temperature. This practice is called syringing and can be used to retard development of Fusarium blight. On turf with a history of Fusarium blight, syringing 2 to 3 hours before the daily temperature maximum should be done daily during July and August. Syringing does not replace deep watering but merely is used to minimize midday heat stress.

FERTILIZATION

An adequate nutritional program is important for an attractive, healthy turf. Selecting the right fertilizer is important from a disease management aspect. Slow-release nitrogen carriers or fertilizers that contain a combination of fast and slow-release carriers are preferred since they do not promote the lush, succulent growth that is highly susceptible to leaf spot, Fusarium blight, and snow mold. A properly fertilized turf is less susceptible to rust and dollar spot.

Timing of fertilizer applications also influences disease. If two applications are made, they should be done in October and again in May. Avoid early spring (March and early April) fertilizer applications, especially with fast-release nitrogen carriers.

SOIL CULTIVATION

Many soils in Nebraska have a high clay and silt content. These soils may become compacted when exposed to traffic. Compaction can impede the growth of the grass plant by limiting air, water, and nutrient movement into the soil. Soil cultivation, through coring or aerification in spring, fall, or both alleviates the compaction problem. Aerification also improves water infiltration into the soil. This increases depth of rooting and allows the plant to better withstand high temperature and drought stress.

THATCH

Practices that promote an actively growing, vigorous turf also contribute to the accumulation of thatch. When thatch accumulation exceeds one-half inch (1.25 cm), the turf should be dethatched. Soil aeration or core removal will not eliminate thatch accumulation but will help slow its development. If excessive thatch has accumulated on a compacted or poorly drained soil, power rake and aerate in fall or spring to reduce the thatch. A light power raking is better than trying to remove too much debris at one time. Avoid excessive fertilization and frequent light irrigations since they also promote thatch accumulation.

MOWING

Mowing height and frequency are important for maintaining a quality turf. Raise mowing heights of cool season grasses such as Kentucky bluegrass and fine fescues during summer months. This will maintain more vegetation and insulate the crown of the grass plant from high temperature stress. For example, mow Kentucky bluegrass at 1.5 to 2.0 inches (3.8-5.0 cm) in spring and fall and at 2.0 to 3.5 inches (5.0 - 8.8 cm) in summer. Gradually lower the mowing height during the transition between summer and fall. Mowing frequency is dictated by turfgrass growth rate. As a general rule, remove no more than 30 to 40% of the leaf area with any mowing.

GENETIC RESISTANCE

Superior Kentucky bluegrass cultivars that, under local conditions, are better able to tolerate the weakening effects of environmental and cultural stress are less likely to be seriously damaged by disease. There is substantial variation in the amount of disease damage to different turfgrass selections and cultivars. For example, a given Kentucky bluegrass cultivar may be seriously damaged by Fusarium blight at a lower mowing height due to stress, but if cut at a 2-inch (5.0 cm) mowing height it may show very little damage.

Genetic resistance or tolerance to certain diseases is not clearly defined. We are dealing with a genetically variable pathogen and host, and variable environmental and cultural factors all of which interrelate to promote or limit the occurrence and severity of a disease. For these reasons it is difficult to group Kentucky bluegrass cultivars into highly resistant, moderately resistant, or susceptible categories.

The basic criteria used for selecting Kentucky bluegrass cultivars for Nebraska are their performances in test plots located throughout Nebraska. Particular attention is paid to Helminthosporium leaf spot resistance, but other turfgrass disease characteristics are also considered. A blend of at least three or four of the improved Kentucky bluegrass cultivars listed in Table 1 is suggested for best performance. These improved cultivars have performed well under Nebraska growing conditions.

FUNGICIDES

Fungicides are divided into two groups: protectants and eradicants. Protectants are applied to the foliage before the disease develops. To be effective they must either persist or be maintained by repeated applications.

Eradicant fungicides kill existing pathogens on contact and prevent further growth of the organism. Systemic fungicides can be applied either as a protectant or as an eradicant. This class of fungicide is taken up by the plant and remains active for a longer period of time, perhaps one to two weeks or more. This gives a longer period of protection to the plant. Systemic fungicides are usually more expensive and are only suggested for specific diseases.

A routine treatment schedule might be one where sprays are applied at regular intervals. The schedule may alternate between contact and systemic fungicides or use combinations of these as a tank mix to prevent different diseases expected at a particular time of the year (Table 2). Generally,

in the spring, one to three applications of a protectant fungicide to control leaf spot is adequate. If other diseases appear, such as Fusarium blight and stripe smut, follow with one to two sprays of a systemic fungicide or systemic-protectant combination as needed for control. Drench systemic fungicides into the soil with at least one inch (2.5 cm) of water immediately after application.

Contact your county agent for additional references on turfgrass diseases and management.

Table 1. A selected list of disease resistant improved Kentucky bluegrass cultivars.[a/]

Adelphi	Cheri	Sydsport
Baron	Enmundi	Touchdown
Bonnieblue	Glade	Vantage
Bristol	Majestic	Victa
Birka	Parade	

1/ Selection was based on cultivar performance in trials at Mead, North Platte, and Scottsbluff, Nebraska.

Table 2: Disease Occurrence and Fungicide Application Guide

Months During Which Diseases Are Most Likely To Occur

Months

Diseases	*Jan*	*Feb*	*March*	*April*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*
Leafspot (Melting-out)												
Fusarium blight												
Stripe smut												
Dollar spot												
Mushrooms (Fairy ring)												
Powdery mildew												
Rust												
Fusarium patch (pink snow mold)												
Typhula blight (gray snow mold)												
Pythium blight												
Brown patch												
Septoria leafspot												

Timing and number of fungicide applications for most effective disease control

Diseases	*Jan*	*Feb*	*March*	*April*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*
Leafspot (Melting-out)				3-4[a/]								
Fusarium blight						2-3						
Stripe smut				1						1		
Dollar spot					2-3			1-2				
Powder mildew					1				1			
Rust								1-2				
Fusarium patch		1								1		
Typhula blight		1								1		
Pythium blight						As needed						
Brown patch						As needed						
Septoria leafspot				3-4								

a/ The number of applications to provide adequate control will vary from season to season depending upon weather.

Fungicides listed in Table 3 represent the best information available. No criticism is intended of fungicides not listed nor is endorsement by the University of Nebraska given to those listed.

Table 3: Fungicides for control of turfgrass diseases.

Diseases Controlled	*Common Name*	*Trade Name*[a/b/]	*Manufacturer*[c/]
Helminthosporium Leaf Spot (Melting-out) *Helminthosporium* spp.	Chlorothalonil	Daconil 2787, 75% WP, 6F(54% a.i.)	Diamond Shamrock
		Proturf 101V Broad Spectrum Fungicide, 9.5% G*	OM Scott
	Cycloheximide	Acti-Dione TFG, 2.1% WP	Upjohn
	Cycloheximide + PCNB	Acti-dione RZ, 76.3% WP*	Upjohn
	Cycloheximide + Thiram	Acti-dione Thiram, 75.7% WP	Upjohn
	Dyrene	Dyrene, 50% WP*	Mobay
		Dymec 50, 50% WP*	PBI-Gordon
		Proturf Fungicide III, 8.7% G*	OM Scott
		Ortho Dyrene Lawn Disease Control, 50% WP	Chevron
	Folpet	Folpet (Phaltan) 50-WP, 50% WP	Stauffer
	Iprodione	Chipco 26019	Rhone-Poulenc
	Kromad	Kromad, 27.5% WP*	Mallinckrodt
	Mancozeb	Fore, 80% WP	Rohm & Haas
		Formec 80, 80% WP*	PBI-Gordon
	Maneb	Tersan LSR, 80% WP	duPont
	Pentachloronitro-benzene (PCNB)	Lawn Disease Preventer 9.95% G	OM Scott
		Proturf FFII, 15.4% G*	OM Scott
		Turfcide, 24% E, 10% G[d/]*	Olin
	Phenylmercuric Acetate (PMA) + Thiram	Proturf Broad Spectrum Fungicide, 5.34% G*	OM Scott
	Thiophanate	Cleary 3336, 50% WP*	W.A. Cleary

[a/] *Trade name followed by the percent active ingredients, W = wettable powder, F = flowable liquid, G = granular, L = liquid.*

[b/] *Trade names marked with an asterisk (*) are generally for use only by professional turfgrass managers.*

[c/] *The labels for the same fungicide may differ between manufacturers. Follow the label directions for the particular product being applied.*

	Thiophanate + Thiram	Bromosan, 66.67% WP*	W.A. Cleary
	Thiophanate + Dyrene	Spectro Turf Fungicide, 50% WP*	W.A. Cleary
	Zineb	Dithane Z-78, 75% WP* Acme Zineb 75 W	Rohm & Haas PBI-Gordon
Fusarium Blight *Fusarium roseum* *Fusarium tricinctum*	Benomyl	Tersan 1991, 50% WP	duPont
	Thiophanate	Cleary 3336, 50% WP*	W.A. Cleary
	Thiophanate-methyl	Fungo 50, 50% WP* Topmec 70 W, 70% WP* Proturf Systemic Fungicide, 1.15% G*	Mallinckrodt PBI-Gordon OM Scott
Sclerotinia Dollar Spot *Sclerotinia homeocarpa*	Benomyl	Tersan 1991, 50% WP	duPont
	Cadmium chloride	Caddy, 20% L*	W.A. Cleary
	Cadmium chloride	Cad-Tret, 83.5% WP*	W.A. Cleary
	Cadmium succinate	Cadminate, 60% WP*	Mallinckrodt
	Calo-Clor	Calo-Clor, 90% WP*	Mallinckrodt
	Chlorothalonil	Daconil 2787, 75% WP, 6F (54% a.i.) Proturf 101 V Broad Spectrum Fungicide, 9.5% G*	Diamond Shamrock OM Scott
	Cycloheximide	Acti-dione TGF, 2.1% WP	Upjohn
	Cycloheximide + PCNB	Acti-dione RZ, 76.3% WP*	Upjohn
	Cycloheximide + Thiram	Acti-dione Thiram, 75.7% WP	Upjohn
	Dyrene	Dyrene, 50% WP* Dymec 50, 50% WP* Proturf Fungicide II, 8.7% G* Ortho Dyrene Lawn Disease Control, 50% WP	Mobay PBI-Gordon OM Scott Chevron
	Iprodione	Chipco 26019	Rhone-Poulenc
	Kromad	Kromad, 27.5% WP*	Mallinckrodt
	Mancozeb	Fore, 80% WP Formec 80, 80% WP	Rohm & Haas PBI-Gordon
	Pentachloronitro-benzene (PCNB)	Lawn Disease Preventer 9.95% G Proturf FFII, 15.4% G* Turfcide, 24% E, 10% G[d/]*	OM Scott OM Scott Olin
	Phenylmercuric Acetate (PMA) + Thiram	Proturf Broad Spectrum Fungicide, 5.34% G*	OM Scott
	Thiophanate	Cleary 3336, 50% WP*	W.A. Cleary

	Thiophanate-methyl	Fungo 50, 50% WP* Topmec 70 W, 70% WP* Proturf Systemic Fungicide, 1.15% G*	Mallinckrodt PBI-Gordon OM Scott
	Thiophanate + Thiram	Bromosan, 66.67% WP*	W.A. Cleary
	Thiophanate + Dyrene	Spectro Turf Fungicide, 50% WP*	W.A. Cleary
	Thiram	Spotrete, 75% WP* Tersan 75, 75% WP Thiramid, 75% WP*	W.A. Cleary duPont Mallinckrodt
Stripe Smut *Ustilago striiformis*	Benomyl	Tersan 1991, 50% WP	duPont
	Pentachloronitro-benzene (PCNB)	Lawn Disease Preventer 9.95% G Proturf FFII, 15.4% G* Turfcide, 24% E, 10% G[d/*]	OM Scott OM Scott Olin
	Thiophate	Cleary 3336, 50% WP*	W.A. Cleary
	Thiophanate-methyl	Fungo 50, 50% WP* Topmec 70 W, 70% WP* Proturf Systemic Fungicide, 1.15% G*	Mallinckrodt PBI-Gordon
Rust *Puccinia spp.*	Chlorothalonil	Daconil 2787, 75% WP, 6F(54% a.i.) Proturf 101V Broad Spectrum Fungicide, 9.5% G	Diamond Shamrock OM Scott
	Cycloheximide	Acti-dione TGF, 2.1% WP	Upjohn
	Cycloheximide + PCNB	Acti-dione RZ, 76.3% WP*	Upjohn
	Cycloheximide + Thiram	Acti-dione Thiram, 75.7% WP	Upjohn
	Mancozeb	Fore, 80% WP Formec 80, 80% WP	Rohm & Haas PBI-Gordon
	Pentachloronitro-benzene (PCNB)	Lawn Disease Preventer 9.95% G Proturf FFII, 15.4% G* Turfcide, 24% E, 10% G[d/*]	OM Scott OM Scott Olin
	Zineb	Dithane Z-78, 75% WP* Acme Zineb 75 W	Rohm & Haas PBI-Gordon
Powdery Mildew *Erysiphe graminis*	Cycloheximide	Acti-dione TGF, 2.1% WP	Upjohn
	Cycloheximide + PCNB	Acti-dione RZ, 76.3% WP*	Upjohn
	Cycloheximide + Thiram	Acti-dione Thiram, 75.6% WP	Upjohn
	Mancozeb	Fore, 80% WP Formec 80, 80% WP*	Rohm & Haas PBI-Gordon

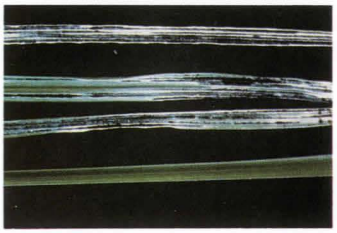
Gray Snow Mold *(Typhula Blight)* *Typhula spp.*	Cadmium chloride	Caddy, 20% L*	W.A. Cleary
	Cadmium chloride	Cad-Trete, 83.5% WP*	W.A. Cleary
	Cadmium succinate	Cadminate, 60% WP*	Mallinckrodt
	Calo-Clor	Calo-Clor, 90% WP*	Mallinckrodt
	Calo-Gran	Calo-Gran, 2.2% G*	Mallinckrodt
	Chloroneb	Tersan SP, 65% WP*	duPont
	Dyrene	Dyrene, 50% WP*	Mobay
		Dymec 50, 50% WP*	PBI-Gordon
		Proturf Fungicide II, 8.7% G*	OM Scott
		Ortho Dyrene Lawn Disease Control, 50% WP	Chevron
	Pentachloronitro-benzene (PCNB)	Lawn Disease Preventer 9.95%	OM Scott
		Proturf FFII, 15.4% G*	OM Scott
		Turfcide, 24% E, 10% G[d/*]	Olin
	Phenylmercuric Acetate (PMA) + Thiram	Proturf Broad Spectrum Fungicide, 5.34% G*	OM Scott
	Thiram	Spotrete, 75% WP*	W.A. Cleary
		Tersan 75, 75% WP	duPont
		Thiramid, 75% WP*	Mallinckrodt
Pink Snow Mold (Fusarium Patch) *Fusarium nivale*	Benomyl	Tersan 1991, 50% WP	duPont
	Cadmium chloride	Caddy, 20% L*	W.A. Cleary
	Cadmium chloride	Cad-Trete, 83.5% WP*	W.A. Cleary
	Calo-Clor	Calo-Clor, 90% WP*	Mallinckrodt
	Calo-Gran	Calo-Gran, 2.2% G*	Mallinckrodt
	Cycloheximide + Thiram	Acti-dione Thiram, 75.7% WP	Upjohn
	Mancozeb	Fore, 80% WP	Rohm & Haas
		Formec 80, 80% WP*	PBI-Gordon
	Pentachloronitro-benzene (PCNB)	Lawn Disease Preventer 9.95% G	OM Scott
		Proturf FFII, 15.4% G*	OM Scott
		Turfcide, 24% E, 10% G[d/*]	Olin
	Phynylmercuric Acetate (PMA) + Thiram	Proturf Broad Spectrum Fungicide, 5.34% G*	OM Scott
	Thiophanate-methyl	Fungo 50, 50% WP*	Mallinckrodt
		Topmec 70 W, 70% WP*	PBI-Gordon
		Proturf Systemic Fungicide, 1.15% G*	OM Scott
	Thiram	Spotrete, 75% WP*	W.A. Cleary
		Tersan 75, 75% WP	duPont
		Thiramid, 75% WP*	Mallinckrodt

Pythium Blight (Greasy spot, Cottony Blight) *Pythium spp.*	Chloroneb	Tersan SP, 65% WP*	duPont
	Cycloheximide + PCNB	Acti-dione TGF, 76.3% WP	Upjohn
	Ethazole	Koban, 35% WP*	Mallinckrodt
	Terrazole	Terrazole, 35% WP*	Olin
Rhizoctonia Brown Patch *Rhizoctonia solani*	Benomyl	Tersan 1991, 50% WP	duPont
	Cadmium chloride	Cad-Trete, 83.5% WP*	W.A. Cleary
	Cadmium succinate	Cadminate, 60% WP*	Mallinckrodt
	Calo-Clor	Calo-Clor, 90% WP*	Mallinckrodt
	Chlorothalonil	Daconil 2787, 75% WP, 4(40.4% a.i.) Proturf 101V Broad Spectrum Fungicide, 9.5% G*	Diamond Shamrock OM Scott
	Cycloheximide + PCNB	Acti-dione RZ, 76.3% WP	Upjohn
	Cycloheximide + Thiram	Acti-dione Thiram, 75.7% WP	Upjohn
	Dyrene	Dyrene, 50% WP* Dymec 50, 50% WP* Proturf Fungicide II, 8.7% G*	Mobay PBI-Gordon OM Scott
		Ortho Dyrene Lawn Disease Control, 50% WP	Chevron
	Iprodione	Chipco 26019	Rhone-Poulenc
	Kromad	Kromad, 27.5% WP*	Mallinckrodt
	Mancozeb	Fore, 80% WP Formec 80, 80% WP*	Rohm & Haas PBI-Gordon
	Pentachloronitro-benzene (PCNB)	Lawn Disease Preventer 9.95% G Proturf FFII, 15.4% G* Turfcide, 24% E, 10% G[d/]*	OM Scott OM Scott Olin
	Phenylmercuric Acetate (PMA) + Thiram	Proturf Broad Spectrum Fungicide, 5.4% G*	OM Scott
	Thiophanate	Cleary 3336, 50% WP*	W.A. Cleary
	Thiophanate-methyl	Fungo 50, 50% WP Topmec 70 W, 70% WP* Proturf Systemic Fungicide, 1.15% G*	Mallinckrodt PBI-Gordon OM Scott
	Thiophanate + Thiram	Bromosan, 66.65% WP*	W.A. Cleary
	Thiophanate + Dyrene	Spectro Turf Fungicide, 50% WP*	W.A. Cleary
	Thiram	Spotrete, 75% WP* Tersan 75, 75% WP Thiramid, 75% WP*	W.A. Cleary duPont Mallinckrodt

Damping-off	Captan	Captan 50-W, 50% WP	Rohm & Haas
Pythium spp.		Orthocide 50 Wettable, 50% WP	Chevron
Fusarium spp.		Orthocide 80 Wettable, 80% WP	Chevron
Rhizoctonia solani		Captan 50-WP, 50% WP	Stauffer
		Captan 80-WP, 80% WP	Stauffer
	Terrazole (Pythium)	Terrazole, 35% WP*	Olin

Leaf Spot (Melting-out)

Fusarium Blight



Stripe Smut

Dollar Spot

Pythium Blight

Brown Patch

Fusarium Patch (Pink Snow Mold)

Typhula Blight (Gray Snow Mold)