

1986 Condensed Plant Disease Management

Guide for FIEI

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You must be certified as a pesticide applicator to use restricted-use pesticides.
See your county Extension adviser in agriculture for information.

The best way to ensure the success of a disease management program is to adapt it to the diseases expected and to use integrated disease control measures. Among these measures are the use of resistant varieties, crop rotations, fungicides, nematicides, and suggested agronomic practices. The success of any one or all of these measures may depend on how carefully you scout your crops. Because periodic crop scouting increases the likelihood that disease controls will be applied properly, it can help prevent both loss through disease and unnecessary use of pesticides.

Specific information for the control of the important diseases of corn, soybeans, wheat, and alfalfa can be found in the following issues of *Report on Plant Diseases*:

- No. 123: "Winter Wheat Disease Management Program"
- No. 212: "Illinois Corn Disease Management Program"
- No. 308: "Alfalfa Disease Management Program"
- No. 507: "Illinois Soybean Disease Management Program"
- No. 1001: "Seed Treatments for Field Crops"

These and other issues of *Report on Plant Diseases* are available from the Department of Plant Pathology, University of Illinois, N533 Turner Hall, 1102 S. Goodwin, Urbana, IL 61801 at a cost of twenty-five cents each.

FEDERAL AND STATE LAWS RESTRICTING PESTICIDE APPLICATION

The U.S. Environmental Protection Agency (EPA) is classifying pesticides for "general" or "restricted" use. Anyone applying a restricted-use pesticide, whether "commercial" or "private," must be certified.

Commercial applicators include not only persons applying restricted-use pesticides for hire but also government personnel, chemical company representatives, and others involved in demonstrational, regulatory, and public health pest control. Certification as a commercial applicator requires passing a written examination administered either by the Illinois Department of Agriculture or the Illinois Department of Public Health.

Private applicators who use restricted-use pesticides "for the purpose of producing any agricultural com-

modity on property owned or rented by [the applicator] or as exchange labor (no compensation) on the property of another must also be certified, either by attending an educational training program or by passing an examination."

Educational training programs for farmers (private applicators) and commercial pesticide applicators are conducted by the Illinois Cooperative Extension Service to prepare persons for certification. The actual certification and the issuing of permits or licenses are handled by the Illinois State Department of Agriculture.

ALWAYS READ THE LABEL BEFORE USING A PESTICIDE

The chemical names used in this circular may be unfamiliar to you. They are the common, coined chemical names and are not capitalized (for example, benomyl). Trade names are capitalized (for example, Benlate). Common chemical names are used in Table 1, and Table 2 lists both the common names and trade names of fungicides and nematicides.

FUNGICIDE APPLICATION

At present, aircraft are the best vehicles for applying fungicides to agronomic crops. Some aircraft may not be equipped or calibrated to do this job. It is therefore important to select an aerial applicator who is familiar with disease control and whose aircraft has been properly calibrated for uniform, thorough coverage of all above-ground plant parts. With the equipment now available, a reasonable job of applying fungicides requires a minimum of 5 gallons of water carrier per acre. Superior coverage may be obtained with more water, but the cost may be prohibitive. Conversely, a lower volume (under 3 to 4 gallons per acre) gives correspondingly poorer control. Five gallons of water can be applied uniformly using approximately 30 to 70 properly spaced nozzles, depending on the aircraft. The nozzles should be D-8 to D-12, hollow cone, with No. 45 or No. 46 cores. The final decision on nozzle number, size, swath width, and placement depends on the air speed, pressure, and volume desired. Droplet size is also important. Ideally, droplets should be 200 to 400 microns in size for thorough and uniform coverage.

ADJUVANTS

When it is compatible with the product label, add a spray adjuvant (surfactant) to the spray mix. Some commonly available surfactants are: Colloidal Products X-77 (liquid, nonionic) Spreader; Colloidal Products Multi-Film L (liquid); Colloidal Products Spray Modifier (liquid, nonionic) spreader sticker; Miller Nu-film-17 liquid spreader sticker; Miller Nu-film-P liquid spreader sticker; Allied Chemical Plyac (liquid) Non Ionic Spreader-Sticker; Rohm & Haas Triton B-1956 (liquid, nonionic) spreader sticker; Triton C-57 spreader binder; and DuPont Spreader Sticker (liquid) spreader sticker.

Adjuvants are suggested for use when you spray corn or small grains. These materials help disperse fungicides and improve coverage.

NEMATICIDE APPLICATION

Granular nematicides/insecticides registered for use on corn and soybeans may be used as in-furrow or band treatments, depending on the product label. In general, band applications have given more consistent control than have in-furrow applications. Follow the manufacturer's suggestions on incorporation.

A more complete list of trade names than that in Table 2 can be found in *Report on Plant Diseases* No. 1001, "Seed Treatments for Field Crops," and No. 1002, "Fungicides, Disinfectants, Grain Preservatives, Surfactants, and Soil-Disinfesting Chemicals." These publications are available from the Department of Plant Pathology, University of Illinois, N-533 Turner Hall, 1102 S. Goodwin, Urbana, IL 61801.

Table 1. Condensed Disease Control Recommendations for Field Crops

Crop	Diseases	Fungicide or nematicide	Comments
Alfalfa	Bacterial wilt, Phytophthora root rot		Resistance should be strongly considered when choosing a variety.
	Leafspots, spring blackstem, and anthracnose		Cut forage in a timely manner to maximize yields and minimize leaf loss. Grow adapted resistant varieties.
	Crown and root rots		Maintain proper fertility and soil pH. Avoid cutting or grazing during the last 5 to 6 weeks of the growing season. Control insect pests.
	Verticillium wilt		Seed treatment with thiram is suggested to prevent seed transmission. Varieties with reported resistance include Apollo II, Trumpeter, WL316, Decathelon, and Funk's G 2640. This disease will only be a problem in stands that are more than 3 years old.
	Seed rots and seedling blights Sclerotinia white mold	captan, captan + zineb, or thiram plus metalaxyl	Seed treatment is not usually necessary with high-quality seed. Spring planting, deep and clean plowing, using 3- to 4-year rotations with nonlegume crops, and avoiding excessively lush growth may help. Chemical controls are not available. The variety Cimarron is reported to be moderately resistant.
Barley	Seed rot, seedling blight, loose smut, and semiloose smut	carboxin + thiram, carboxin (planter-box) plus maneb + HCB or captan + HCB (planter-box), captan + carboxin	Seed treatment is strongly suggested. Carboxin is required for loose smut control.
	Helminthosporium leaf blight, Septoria leaf blotch	mancozeb	Apply when disease conditions warrant. Apply when plants are in the late tillering to jointing stage; repeat at 7- to 10-day intervals. Do not make more than 3 applications. Do not apply within 26 days of harvest.
	Barley yellow dwarf virus		Plant winter barley after the fly-free date and spring barley as early as possible.
Clover	Anthracnose diseases		Grow adapted resistant varieties.
	Crown and root rots		Same as for alfalfa.
	Seed rots and seedling blights		Same as for alfalfa.
Corn	Seed rots and seedling blights	captan, captan + maneb, captan + zineb, captan + HCB + maneb, carboxin, carboxin + thiram, mancozeb, maneb, PCNB + etridiazol, TCMTB, thiram, thiram + maneb	Sow injury-free, plump seed in soils at 50°F or above. Prepare the seedbed properly and place herbicide, fertilizer, insecticide, and seed correctly. Note: fungicide plus insecticide seed treatments are commonly used.

Table 1. (continued)

Crop	Diseases	Fungicide or nematicide	Comments	
Corn (cont.)	Helminthosporium leaf blights northern leaf blight northern leaf spot southern leaf blight Helminthosporium leaf blight	zineb, mancozeb	Plant resistant hybrids. Apply 2 to 4 sprays at 10-day intervals starting when disease appears. Fungicide control is justified only when significant disease occurs less than 2 weeks after tasseling. Use a spreader sticker. Fungicide applications are generally economically feasible only in seed production fields. Do not apply within 40 days of harvest. Do not feed fodder or forage to livestock.	
	Common rust and southern rust		Same as for Helminthosporium leaf blights.	
	Stewart's disease		Plant resistant hybrids and use insecticides to control flea beetles when necessary.	
	Goss's bacterial wilt and leaf blight		Plant resistant hybrids. Clean plowdown and 2-year crop rotations also give control. Use clean plowdown only where erosion will not be a problem.	
	Anthraxnose, Physoderma brown spot, eyespot, gray leaf spot, yellow leaf blight		Plant resistant or tolerant hybrids. Practice crop rotation or clean tillage where soil erosion considerations allow.	
	Crazy top and sorghum downy mildew		Plant resistant or tolerant hybrids. Improve drainage in affected area. Control wild cane to reduce sorghum downy mildew inoculum.	
	Virus diseases		Plant resistant hybrids. Control johnsongrass to reduce overwintering source of MDMV and MCDV.	
	Stalk rots <i>Diplodia</i> charcoal <i>Gibberella</i> <i>Nigrospora</i> <i>Fusarium</i> anthracnose		Plant hybrids with good stalk rot resistance and stalk strength. The use of nitripyrin (N-Serve) may be helpful where nitrogen loss is expected. Maintain adequate phosphorus and potassium fertility for the rate of nitrogen used. Control corn borers and corn rootworms. Scout fields at 30- to 40-percent moisture for lodging potential. Walk a zig-zag pattern through the field pushing random plants about 5 inches from the vertical. If more than 10 to 15 percent lodge, schedule the field for early harvest.	
	Storage molds <i>Penicillium</i> spp. <i>Aspergillus</i> spp.	propionic acid, isobutyric acid, acetic acid, or mixtures of these	Grain treated with an acid grain preservative can be used only for animal feed. Store undamaged corn at 15 to 15.5 percent moisture from fall until spring, then dry to 13 percent for long-term storage. Grain damaged by field molds, insects, etc., should be dried to 13 to 13.5 percent moisture at harvest. Watch stored grain for heating, a musty odor, crusting, or other signs of storage mold activity. Control stored grain insects. Make sure combine is adjusted to avoid damage to grain. Remove fines and foreign material before storage.	
	Nematodes root-lesion needle dagger spiral lance stubby-root sting stunt	carbofuran, ethoprop, terbufos	Use nematicidal rates of these materials only where soil tests indicate economic populations of nematodes. Use crop rotation where appropriate.	
	Oats	Seed rots and seedling blights, loose smut and covered smut	captan + HCB, captan + HCB + maneb, carboxin, carboxin + thiram, HCB + maneb, PCNB, TCMTB, captan + carboxin, carboxin + maneb	Seed treatment is strongly suggested for control of smut diseases.
		Barley yellow dwarf		Grow resistant varieties. Plant susceptible varieties as early in the spring as possible.
		Crown rust		Plant resistant varieties. Fungicides applied for <i>Septoria</i> and <i>Helminthosporium</i> will also aid in crown rust control.
Helminthosporium leaf spot, <i>Septoria</i> leaf blotch		mancozeb	Spray when disease is present and weather conditions favor disease development. Start applications at tillering to jointing stage. Make a second application 10 days later. A third application is permissible but may be uneconomical. Do not apply within 26 days of harvest.	

Table 1. (continued)

Crop	Diseases	Fungicide or nematicide	Comments
Sorghum	Seed rots, seedling blights, and smuts	captan, captan + thiram, captan + zineb, captan + PCNB, HCB + maneb, PCNB + etridiazol, thiram	Fungicide seed treatment is strongly suggested.
	Other diseases		Plant resistant or tolerant hybrids. Diseases other than the smuts have not been important in Illinois.
	Nematodes	aldicarb	
Soybeans	Seed rots and seedling blights (primarily Pythium, Phytophthora, Rhizoctonia)	captan, captan + maneb, captan + thiram, captan + zineb, captan + HCB + maneb, captan + PCNB, HCB + maneb, mancozeb, maneb, PCNB + etridiazol, TCMTB, thiram, Vitavax + thiram, carboxin + captan, Vitavax + metalaxyl, captan + metalaxyl, metalaxyl, thiram + thiazobenzazole	Plant high-quality seed germinating greater than 70 percent in a cold germination test. Seed treatment is recommended where (1) seed of poor quality due to fungal infection must be planted; (2) delays in emergence are anticipated; (3) seed is planted to produce seed; and (4) reduced seeding rates are used.
	Brown stem rot		Rotate, using 2 years of corn in fields where disease has been damaging. The varieties BSR 301 and BSR 201 have moderate resistance.
	Sclerotinia white mold		Rotate with nonlegume crops. Plant moderately resistant varieties in fields where disease has been present before.
	Phytophthora root rot	metalaxyl	Plant varieties with race-specific or field resistance. Race-specific resistance will provide immunity to specific races. However, in many areas races of the Phytophthora fungus are present that can attack this type of resistance. Varieties with field tolerance are resistant after two sets of trifoliolate leaves develop. However, they are very susceptible to the seedling blight phase of the disease. Therefore, varieties with field-tolerance resistance should be protected in the seedling stage with metalaxyl fungicide applied as a seed treatment.
	Soybean cyst nematode	aldicarb, carbofuran, fenamiphos	Rotate to nonhost crops for 3 years and monitor SCN populations by taking soil samples the second and/or third year. One year can be a resistant bean such as Fayette (III), Franklin (IV), CN 210 (II), or CN 290 (II). Nematicides are suggested only where (1) crop rotations are not possible and (2) resistant varieties cannot be used. Aldicarb has given the most consistent control in Illinois; applied in-furrow, it has given control equal to higher rates applied as bands. Both aldicarb and carbofuran can be applied in-furrow. See <i>Report on Plant Diseases</i> No. 501 for more information.
	Pod and stem blight, anthracnose, stem canker, Septoria brown spot, Cercospora leaf blight, and purple seed stain	benomyl, thiabendazole, thiophanate-methyl, chlorothalonil	Suggested for use where disease conditions warrant (see Table 2). Two applications are suggested for maximum yield and seed quality. Benomyl, thiophanate-methyl, and thiabendazole have 24c labels for a single late application at higher labeled rates for improved seed quality. Use pod tests to determine the need for late applications.
Wheat	Seed rots, seedling blights, loose smut, and bunt (stinking smut)	carboxin + thiram, carboxin (planter-box) plus maneb + HCB, captan + carboxin, or maneb + thiabendazole	Seed treatment is strongly suggested. Higher labeled rates of carboxin are required for bunt control. Only carboxin controls loose smut.
	Leaf rust, Septoria leaf blotch, Septoria glume blotch, Helminthosporium leaf blight, stem rust, and Pyrenophora tan spot	mancozeb, zineb, triadimefon	Apply fungicide when disease conditions warrant. Begin applications at the jointing stage and repeat at 7-day intervals. Do not make more than 3 applications. Do not apply within 26 days of harvest. Triadimefon is limited to two applications per season. Triadimefon will give excellent control of rust, moderate control of Septoria leaf blotch, and poor control of Septoria glume blotch and tan spot. Do not apply within 21 days of harvest or within 35 days of seeding corn, sorghum, or soybeans. Plant resistant varieties.
	Powdery mildew	triadimefon	Plant resistant varieties. Check with your Extension adviser for chemical control recommendations.

Table 1. (continued)

Crop	Diseases	Fungicide or nematicide	Comments
Wheat (cont.)	Virus diseases wheat streak mosaic wheat soilborne mosaic barley yellow dwarf mosaic wheat spindle streak mosaic		Plant resistant or tolerant varieties. Plant after the fly-free date. Control volunteer wheat in and around production fields.
	Take-all		Plant after the fly-free date. Use ammonium form of nitrogen fertilizer. Use crop rotations of 2 to 3 years between wheat crops where possible.

Table 2. Classification, Common Names, and Trade Names of Pesticides Mentioned in This Report

Common name	Trade name	Use classification
aldicarb	Temik	Unclassified
benomyl	Benlate	Unclassified
captan	Captan, Orthocide, and many others	Unclassified
captan + HCB	Orthocide-HCB, Miller's HCB 4 Flowable, and many others	Unclassified
captan + HCB + maneb	Res Q	Unclassified
captan + PCNB	Stauffer Captan-Terraclor 10-10 and 30-30 Seed Protectant, Orthocide PCNB 10-20 Dust, and many others	Unclassified
captan + zineb	Staples Dithane Seed Treatment Dust	Unclassified
captan + carboxin	Orthocide-Vitavax 20-20, Vitavax-Captan 20-20	Unclassified
carbofuran	Furadan	Restricted-use
carboxin	Vitavax 34	Unclassified
carboxin + captan	Enhance	Unclassified
carboxin + maneb	Enhance Plus	Unclassified
carboxin + thiram	Vitavax 200, Vitavax-T	Unclassified
chlorothalonil	Bravo 500	Unclassified
ethoprop	Mocap	Restricted-use
etridiazol	Terrazole	Unclassified
fenamiphos	Nemacor	Restricted EC formulations: restricted-use.
maneb	Manzate D, Manzate Maneb Fungicide, Dithane M22, M22 Special, and many others	Unclassified
maneb + HCB	Granox NM, Granox Flowable	Unclassified
maneb + thiabendazole	Granox Plus	Unclassified
mancozeb	Manzate 200, Dithane M45	Unclassified
metalaxyl	Apron 2E	Unclassified
PCNB	Terraclor	Unclassified
PCNB + etridiazol	Terraclor Super X, Terra-Coat L21, L205, and SD205 Seed Treatment	Unclassified
TCMTB	Busan, Cover-Up, and Thiogem	Unclassified
terbufos	Counter	Restricted-use
thiabendazole	Mertect 340F	Unclassified
thiophanate-methyl	Topsin M	Unclassified
thiram	Arasan 50-Red, Thiram, Moly-Co-Thi, Stand-up, Thiram 42S, and many others	Unclassified
thiram + thiabendazole	Agrosol	Unclassified
triadimefon	Bayleton	Unclassified
zineb	Dithane Z-78	Unclassified

FUNGICIDE GUIDELINES

Seed Treatments

Fungicide seed treatments will generally increase stands regardless of quality. However, the greatest benefits will be found (1) where low seeding rates are used; (2) where seed must be used that is of poor quality because of fungal infection; and (3) where seed is planted in a seedbed in which delays in germination or emergence are likely.

Fungicide seed treatments are not a substitute for high-quality seed and will not improve the performance of seed that is of low quality due to mechanical damage or physiological factors. Treated seed of low quality will not produce stands and/or yields equal to untreated high-quality seed. Therefore, only high-quality seed should be considered for planting.

The following checklist for soybean seed treatments (Table 3) is designed to assist in determining the need for seed treatments, especially for control of damping-

Table 3. Soybean Seed Treatment Checklist for Reducing Early Season Stand Losses Due to Damping-Off

Risk factors	Point value if answer is yes
Rainfall for the 7-day period before planting was:	
Below normal	2
Normal	1
Above normal	4
Seedbed preparation was:	
Conventional tillage	1
Rough surface (conservation tillage)	2
No-till	4
Germination at time of planting is less than 85 percent in a warm test or less than 70 percent in a cold test (such seed should be discarded if at all possible)	3
Previous soybean stand in field was reduced by damping-off or Phytophthora root rot	4
Level of resistance to Phytophthora root rot is:	
Susceptible	2
Tolerant	4
Resistant to one or more races	1
Expected rainfall for 96 hours following planting is:	
Lower than normal	1
Normal	1
Above normal	3
Low areas of field remain flooded for 48 hours following 1 inch of rainfall	4
Seeding rate is less than 55 pounds per acre	3
Field is planted to double crop soybeans	3

TOTAL POINTS AND SUGGESTIONS

Less than 7 points: seed treatment will probably not be beneficial.
 Seven to 15 points: seed treatment may be beneficial if weather conditions do not favor rapid germination and growth.
 Greater than 15 points: seed treatment will be beneficial to stand development.

off fungi. Selection of the proper seed treatment is very important because of the specificity of certain fungicides for controlling only *Phytophthora* and *Pythium*.

Foliar Treatments

Foliar fungicide treatments may reduce losses from *Septoria* brown spot, *Cercospora* leaf blight (purple seed stain), anthracnose, pod and stem blight, and stem canker. These diseases are most damaging when the weather is warm (70° to 80°F) and wet from early pod fill to maturity. Foliar sprays of fungicides may increase yields 10 to 15 percent, increase seed quality, and reduce disease losses when such fields are planted to soybeans the following year. The use of fungicides should be based on expected disease severity. The six diseases just listed will *not* be as severe in cool, dry seasons and where adequate rotations have been used.

Based on seven years of research data, yields have been increased by an average of 4.7 bu/A (range 1.2-13.4) and seed quality has been increased by an average of 10.7 percent (range 0-42.5 percent) by the use of foliar fungicides.

The checklist in Table 4 can be used at early bloom to determine whether fungicide controls for the six diseases mentioned previously should be used. A key factor in this checklist is the presence of black specks (pynidia) on fallen petioles. Only brown, fallen petioles should be assayed and more than two-thirds to three-

Table 4. Checklist to Determine Whether Foliar Fungicide Application Should Be Made to Soybeans

Risk factors	Point value if answer is yes
Rainfall, dew, and humidity up to early bloom and pod set are:	
Below normal	0
Normal	2
Above normal	4
Soybeans were grown in the field last year	2 to 3
Chisel-plow, disk, or no-till was used	1
Pynidia (black specks) are visible on fallen petioles and <i>Septoria</i> brown spot is obvious on the lower leaves.	2
Early-maturing variety (not full-season)	1 to 2
Soybeans are to be used or sold for seed	6
Yield potential is better than 35 bushels per acre	2
Seed quality at planting time is less than 85 percent germination in a warm test	1
Other conditions that favor disease development (weather forecast with a 30-day period of greater-than-normal rainfall and a field history of disease) ..	1 to 3

NOTE: If the total point value is 15 or more, application will probably mean increased yields and higher seed quality.

fourths of these petioles should show pycnidia. If growers use the checklist and apply fungicides correctly, maximum benefits should be achieved. Less than optimal benefits will be achieved if fungicides are applied incorrectly or if disease severity does not warrant spraying.

DISEASE REACTIONS OF FIELD CROP VARIETIES RECOMMENDED FOR ILLINOIS

Disease reactions may vary from one locality to another and from year to year, depending on what physiologic races of the pathogens are present. For the latest information on suggested crop varieties, consult your county Extension adviser or the Department of Agronomy, University of Illinois, W-201 Turner Hall, 1102 S. Goodwin, Urbana, IL 61801.

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Wheat

		Recom- mended area of state ^a	Stem rust	Leaf rust	Loose smut	Septoria	Powdery mildew	Soil- borne mosaic	Barley yellow dwarf	Spot blotch	Pyreno- phora	Wheat streak mosaic	False black chaff	Wheat spindle streak
<i>Spring</i>														
Era		N	R	S ^b	MR	MS	MS			MR	MS			
Olaf		N	MR	MR	S									
<i>Winter</i>														
Abe	(Soft)	N,C,S	R	S ^b	MS	S	MS	R	MS				R	MS
Argee	(Soft)	N	R	S	MR		MS	R	MR					
Arthur 71	(Soft)	N,C,S	R	S ^b	MS	MS	MS	R	MS				R	MS
Auburn	(Soft)	N,C,S	R	R	MR	R	MR	R	MS					MS
Beau	(Soft)	N,C,S	R	MS	MS	MR	MS	R	MS				R	MS
Becker	(Soft)	N,C,S		MR	MS	MS	S	MR						R
Caldwell ^c	(Soft)	N,C,S	R	MR	MR	MS	MR	MR	MR		S			MS
Centurk 78	(Hard)	N,C	MR	MS	MR	S	S	MS	MR		MR	S		
Fillmore	(Soft)	N,C,S	R	R	MR	MR	MR	MS	MS					MS
Hart	(Soft)	N,C,S	S	S ^b	R	MR	VS	R	MR					MR
Newton	(Hard)	N,C,S	MR	MR				MR	MS					
Pike	(Soft)	N,C,S	S	S	MR	MS	S	MR	MR					MS
Roland	(Soft)	C,S	R	S ^b	MS	S	MS	R	MS			MS		MR
Rosen	(Soft)	S	R	S		S	S		MS					
Scotty	(Soft)	C,S	R	MR		MR	R	R	MS					
Tyler	(Soft)	S	S	S			R	R	MR					

Note: Several private varieties have high yield potentials and are widely planted. Growers should contact seed company representatives for information on disease resistance.

Note: In this table, average disease reaction is indicated as follows: R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; Blank = no information or disease is not important.

^a Area of Illinois where variety is recommended: N = northern; C = central; S = southern.

^b Susceptible to new races that are virulent on *Lr 9* and very common throughout the central United States in 1981 and 1982. Era is susceptible to nearly all leaf rust races as a seedling but has adult plant resistance that normally prevents leaf rust development on the flag leaf.

^c Moderate resistance to take-all.

Grasses

Variety	Recommended area of state ^a	Brown leaf spot (blight)	Bacterial blights	Leaf scald	Rust	Seedling disease complex	Northern leaf blight	Anthraxnose
<i>Bromegrass, smooth</i>								
Barton	N,C,S					MS		
Baylor	N,C,S	R	MS	MS				
FS Beacon	N,C,S					MS		
Blair	N,C,S	R	MS	MS		MS		
Lincoln	N,C,S	MS	MS	MS		MS		
Southland	S	S	MS	MS				
<i>Orchardgrass</i>								
Able	N,C,S							
Boone	S	MS			MS			
Comet	N,C							
Dart	N,C,S				MS			
Dayton	N	MS			MS			
Hallmark	N,C	MS			MS			
Ina	S							
Jackson	N,S							
Napier	N,C,S	MS			S			
Potomac	N,C	MS			S			
<i>Sudangrass</i>								
Piper	N,C,S						MR	MS
<i>Tall fescue</i>								
Alta	N,C,S				MR			
Fawn	N,C,S				MR			
Kenhy	N,C,S				MR			
Kentucky 31	N,C,S				MR			
Kenwell	N,C,S				MR			
<i>Timothy</i>								
Clair	N,C,S							
Climax	N,C,S							
Itasca	C							
FS 954	N,C							
FS 955	N,C,S							
Pronto	C							
Timfor	N,C,S							
Toro	N,C							
Verdant	C							
<i>Reed canarygrass</i>								
Flare	N,C							
Rise	N,C,S							
Vantage	N,C,S							

Note: In this table, average disease reaction is indicated as follows: R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; VS = very susceptible; Blank = no information.

^a Area of Illinois where variety is recommended: N = northern; C = central; S = southern.

Soybeans

Variety	Suggested area of the state ^a	Phytophthora rot ^b	Bacterial pustule	Powdery mildew	Pod and stem blight	Soybean cyst nematode	Purple seed stain	Frogeye leaf spot	Downy mildew	Sclerotinia white mold
Amsoy 71	N,C	R	S	VS	S	S	VS	S-2	S	S
Beeson 80	N	R-1-3,7-9	S	MS	S	S	S	R-1,2	S	
Bonus	S	R	S	S	S	S	S	S-2	VS	S
BSR 201 ^c	N,C	R								
Calland	C,S	R	S	R	S	S	S	S-2	S	S
Century 84	N,C	R-1-9								
Century	N,C	R-1,2	S		S	S	S	S-2	MS	S
CN 210						R-3				
CN 290						R-3				
Corsoy 79	N,C	R-1-3,7-9	S	VS	S	S	S	S-2	MS	
Crawford	S	S	S		S	S	MR	S-2	S	
Cumberland	C,S	MS	R		MR	S	S	R-1,2	MS	
Cutler 71	S	R	S	R	S	S	S	R-1,2	S	
Dare	S	S	R		MS	S	S	R-1,2	MR	
DeSoto	C,S	S	S		S	S	S	S-2	S	S
Dyer	S		R		S	R-3				
Egyptian	S					R-3,4				
Elf	C,S	S	R	S		S	S	MR-2	S	VS
Elgin	N,C	S	R				S	S		
Essex	S	S	R	MR	S	S	MS	S-2	MS	
Fayette	C,S	S	R		S	R-3,4	S	S		
Forrest ^d	S	MR	R			R-3				
Franklin	S	R	R		S	R-3	S		S	S
Gnome	N,C	S	R		S	S				S
Hack	N,C	R-1,2,10-19,24								
Harcor	N	R-1,2	S		S	S		S-2		S
Hark	N	S	S	VS	S	S		S-2	S	
Harper	C,S	T	R				MR	MS-2		
Hobbit	C	S	R							
Hodgson 78	N	R-1,2			S	S	S	S-2		MR
Lawrence	S	S	R			S				
Nathan ^e	S					R-3,4				
Nebsoy	N,C	R-1,2	S		MR	S		S-2		S
Oakland	C,S	R-1,2	S	R	MR	S	S	S-2	MS	
Pella	C,S	R-1,2	S		S	S	S	S-2	S	S
Pixie	S	S			S	S	S			S
Sprite	S	S			S	S	S			S
Union	S	R	R	R	MS	S	S	S-2	R	MR
Wayne	C,S	MS	R	MR	S	S	S	R-1,MR-2	VS	MR
Wells II	N,C	R-1-3,6-9	S	VS	S	S	S	R-2	MS	
Will	C,S	S	R		MS	S	S	S	S	
Williams 82	C,S	R-1-9	R			S	S	S-2	S	

Note: Growers should contact individual seed companies for information on disease resistance of private varieties.

Note: In this table, average disease reaction is indicated as follows: R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; T = field tolerance; VS = very susceptible; Blank = no information. Designations such as S-1,2 or R-1,2 indicate susceptible (S) or resistant (R) to the pathogens indicated by the race numbers.

^a Area of Illinois where variety is suggested: N = northern; C = central; S = southern.

^b Races 1 and 2, except where other races are indicated.

^c BSR 201 is resistant to brown stem rot.

^d Forrest is also highly resistant to wildfire, target spot, reniform nematode, and root-knot nematode.

^e Nathan is also resistant to root-knot nematode.

Barley

Variety	Recom- mended area of state ^a	Stem rust	Leaf rust	Loose smut	Covered smut	Septoria	Powdery mildew	Barley yellow dwarf	Barley stripe mosaic	Spot blotch	Net blotch	Helmin- thospor- ium stripe	Scald
<i>Spring</i>													
Larker	N	MR	S	S	S	S	S	MS	S	S	MS		S
Manker	N	MR	S	S	S	S	S	MS	S	MR	MR		S
<i>Winter</i>													
Barsoy	C,S	MS	S	S			MR	S	S		MS	S	S
Paoli	C,S	MS	MS	MS			MR	S	S		MR	MR	MR
Pike	C,S	MS	S	S			MR	S	S		MR	MR	S

Note: In this table, average disease reaction is indicated as follows: R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; VS = very susceptible; Blank = no information.

^a Area of Illinois where variety is recommended: N = northern; C = central; S = southern.

Oats

Variety	Recommended area of state ^a	Stem rust	Crown rust	Smuts	Barley yellow dwarf	Septoria
<i>Spring</i>						
Clintford	N,C	S	VS	R	MS	MS
Dal	N	MS	MR	MR	MS	MS
Froker	N	MR	MS	S ^b	S	MR
Lang	N,C,S	MS	S	MS ^b	MR	MS
Larry	N,C,S	MS	S	MS	MR	MS
Noble	N,C,S	MS	S	R	MR	MS
Ogle	N,C	MS	S	MS	MR	MS
Otee	N,C,S	MS	S	MS	R	MS
Wright	N	MS	S	MS ^b	MS	MS
<i>Winter</i>						
Compact	S	S	S	MR	S	MS
Norline	S	S	S	MR	MS	MS
Walken	S	S	S	MR	S	MS

Note: In this table, average disease reaction is indicated as follows: R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; VS = very susceptible; Blank = no information.

^a Area of Illinois where variety is recommended: N = northern; C = central; and S = southern.

^b Susceptible to new races of smut fungi.

Red Clover

Variety	Recom- mended area of state ^a	Powdery mildew	Northern anthrac- nose	Southern anthrac- nose	Viruses	Variety	Recom- mended area of state ^a	Powdery mildew	Northern anthrac- nose	Southern anthrac- nose	Viruses
Arlington	N,C	R	R		MR	Ruby	N,C,S	R	R	T	
E-688	C,S	R	T	R		Kenland	C,S	S	S	R	S
Florex	N	R	R		R	Kenstar	C,S	S	S	R	MR
Florie	N,C,S	R	R	R	R	Lakeland	N	R	R	S	MR
						Mega	N,C,S	R	R	R	
						Redland	C,S	R	MR	R	S
						Redland II	C,S	R	R	R	
						Redman	N,C,S	S	R	MR	S

Note: In this table, average disease reaction is indicated as follows: R = resistant; MR = moderately resistant; T = tolerant; S = susceptible; Blank = no information.

^a Area of Illinois where variety is recommended: N = northern; C = central; S = southern.

Alfalfa

Variety	Verticillium wilt	Bacterial wilt	Common leaf spot	Lepto leaf spot	Spring black stem	Anthracnose	Phytophthora root rot	Winter hardiness ^a
Acclaim ^b	MR	R	MR			MR	MR	H
Advantage		R				MR	R	MH
Answer		R				MR	VR	MH
Apollo II	MR	R				MR	R	H
Armor		R				MR	R	MH
Arrow ^b	R	R				R	R	H
Baker		R	MR			MS	S	H
Blazer		R				S	R	
Cimarron		MR	MR			R	R	MH
Conquest		R						
Dart ^b	R	R				R	R	MH
Defender		R				MR	MR	MH
DeKalb Brand 120		R					R	
DeKalb Brand 130		R				MR	S	MH
Discovery		R	MS				S	H
Dominor		R					S	H
Drummor			R			MR	R	H
Duke		R				MR	R	MH
Epic		R				S	R	
Expo		R				MR	R	MH
Futura		R				MR	MR	H
Glory		R	R					H
G-2815		R				MR	MS	MH
G-7730		R				MS	R	
Hi-phy		R					R	
Honeoye		MR	MS	MS	MS	S	S	H
Jubilee ^b		R				R-MR	R	H
Magnum		R					MR	
Marathon		MR	MS	MS		S	S	MH
Mercury		R				MR	R	H
Olympic		R	MR			R	S	H
Oneida		R					R	H
Pacer		R	MR	MR	MS	S	MS	H
Peak		R				MS	R	
Perry		R				MR	S	H
Phytor		R	MR				R	H
Pioneer Brand 520		R	MS	MS	MS	MS	S	H
Pioneer Brand 521		R	MS	MS	MS	MS	S	H
Pioneer Brand 524		VR	MS			S	S	H
Pioneer Brand 526		R				MS	MS	H
Pioneer Brand 531		R				MS	S	
Pioneer Brand 532		R				MS	S	
Pioneer Brand 555		R				MR	S	MH
Pride Polar II		R					R	H
Pride Preserve ^b		MR	R			MS	MR	H
Primal		R						H
Raidor		R				MR	S	MH
Riley		VR				R	S	MH
Saranac AR		MR	MR	MS	MS	R	S	H
Shenandoah ^b		R				R	R	MH
Spredor 2		R				S	S	H
Sunrise		R						MH
Tempo		MR	MR	MS	MS	S	S	H
Thunder		R				MR	R	H
Trident		R					VR	H
Trumpeter	MR	MR				R	S	H

Alfalfa (continued)

Variety	Verticillium wilt	Bacterial wilt	Common leaf spot	Lepto leaf spot	Spring black stem	Anthracnose	Phytophthora root rot	Winter hardiness ^a
Valor		R	MS	MR	MR	MS	S	H
Vancor		R				R	MR	H
Vernal		R	MS	MS	MS	S	S	H
Voris A-77		VR				R	MS	H
WeeVlcheck		VR	MR	MS	MS	S	S	H
WL-215		R	MS	MS	MS	S	MS	H
WL-219		R	MR	MS	MS	MS	MS	H
WL-220		R	R			MS	R	H
WL-221		R				MR	S	H
WL-311		R	MS	MS	MS	MR	MS	H
WL-312		R				MR	MR	H
WL-313		R				MR	S	H
WL-315 ^b		R				MR	MR	H
WL-316	R	MR				R	S	H
WL-318		MR	MS	MS	MS	MR	MR	MH
WL-320 ^b	MR	R				MR	R	MH
Wrangler ^b	R	R					R	H

NOTE: In the table, average disease reaction is indicated as follows: VR = very resistant; R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; Blank = no information.

^a Winter hardiness is based primarily on autumn growth ratings: VH = very hardy; H = hardy; MH = moderately hardy; MS = winter hardiness is questionable.

^b Fusarium wilt resistant.

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