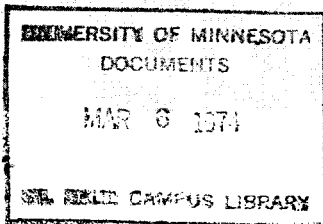


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HOWARD L. BISSONNETTE

Chemical Control  
of Cereal Leaf Diseases

Leaf diseases of cereals, such as leaf rust, Septoria leaf blotch, and the Helminthosporium leaf spots, can be kept under control with the proper use of fungicides. Disease control is not a new idea. Plant breeders have developed spring wheat, durum wheat, and barley varieties that are resistant to the races of stem rust presently occurring. The use of resistant varieties is a method of controlling a plant disease. Many of our spring wheat, durum wheat, and barley varieties do not have resistance to Septoria leaf blotch and other leaf diseases.

Because these diseases may cause annual crop loss of 28% or more, it is of benefit to protect the wheat crop from these diseases. The proper use of fungicides on cereals will prevent or retard the development of these diseases on wheat and barley. The fungicides available are classified as protectants and, therefore, must be used to protect the plant foliage before the disease has destroyed the plant tissue.

The yield of wheat is dependent on several factors, e.g. variety, soil fertility, growing condition, weed control, etc. Even when all of these conditions are favorable and a good crop is expected, fungus diseases can develop on the plant and reduce crop yields in a relatively short time (two weeks).

**Considerations to make before spraying**

The value of the crop: What is the yield potential of the crop? Stand and general growing conditions will determine your potential yield. A potential crop of 10 or 15 bushels probably would not warrant any additional expenses. However, a 40 or 60 bushel crop may be able to support the additional expense to prevent disease losses. In past years, what has been the difference between your estimated yield and your actual yield?

What variety are you growing? A variety that is susceptible to stem rust and/or leaf rust should not be grown.

The durums such as Leeds and Ward have resistance to leaf rust but are susceptible to Septoria blotch. Spring wheat varieties such as Era, Olaf, and WS 1809 have leaf rust resistance, but their resistance to Septoria has not been determined. For the present, the durum and spring wheat varieties are resistant to stem and leaf rust, and it is reasonable to assume that new varieties also will have resistance to stem and leaf rust.

The recommended barley varieties are resistant to stem rust. Dickson has a degree of resistance to the leaf spot diseases. Larker appears to be quite susceptible to the various leaf diseases. For future planning it is important to know and observe the disease reaction of the various wheat and barley varieties that you grow.

When do these diseases first show up in your fields? How fast does a disease develop? How often do you really get out and look at your crop? The diseases we are discussing require about the same environmental conditions for development as do the cereal plants. With moderate temperatures (65°-80°) a fungus disease may become established in 10 to 14 days. In other words, the disease symptom you see today is the result



Early symptoms of leaf spot diseases on wheat.

of an infection that took place at least 10 days ago. Therefore, when you check your field and see just a few disease symptoms on the leaves of your crop, the crop already may have a severe disease condition. If the weather has been optimal for disease development, many infections already may be present on the leaves but are not yet visible. These diseases are spread by fungus spores, millions of which are usually available for infection if conditions are right. The best results with protectant fungicides will be obtained when the plant is protected (with fungicides) before infection occurs.

Disease Control Practice: At present the airplane is the best vehicle for applying the fungicide material to the crop. Some airplanes may not be equipped to do this job. Therefore, it is important to select an aerial operator who is familiar with disease control and whose airplane can do the job. With the equipment now available, a reasonable job of applying the fungicide requires 5 gallons of water per acre. A better application may be obtained with more water but might make the costs prohibitive.



Applying fungicide to a wheat crop for control of leaf spot diseases.

The fungicides being used are protectant materials. Such materials protect the plant from infection and usually will have little effect on established infection sites.

Fungicides for Use on Cereal Crops				
	Dithane M-45	Manzate 200	Zineb	Kocide 101
Wheat	X	X	X	X
Barley	X	X	No	X
Oats	X	X	No	X

X = registered for such use.

**Rate:** Apply fungicides at the rate of 1½ to 2 pounds of wettable powder per acre in 5 gallons of water. In all cases, read the label for the proper rate of the particular material. It is advisable to use a spreader-sticker agent also.

The time of application is very critical and will vary from area to area, and season to season. Therefore, the application should be adjusted to the stage of growth. The first application to wheat should be at the time of early heading\* or before there is more than a trace of disease on the flag leaf. When spraying barley, the first application should be as the heads are developing in the boot. In either wheat or barley spraying, the second application should follow within 10 days. If the disease begins to show up before heading, then the spray date should be moved ahead. We want to keep the flag leaf as disease-free as possible until after the kernels have filled.

**Things to do:** Know your crop. What is your potential yield? When does heading occur? Watch for disease development! The leaf diseases usually will begin on the lower leaves, and we want to protect the flag leaf.

If this is your first try at cereal disease control, go at it easy; 20 to 50 acre tests are recommended. It will take some know-how on your part to adjust the proper timing of the first application. For your own information you should measure the acreage treated and record the yield from this area. Likewise, an adjacent area that is untreated should be measured and yield recorded. Use a good field—do not expect to obtain a magic improvement on some poor land.

#### CEREAL LEAF DISEASE CONTROL

Two applications of fungicide  
Zineb, Dithane M-45, Manzate 200, or Kocide 101  
1½ to 2 pounds/acre

#### PLUS

Spreader-sticker  
Applied by air in 5 gal. of water/acre  
1st application at early heading  
2nd application 10 days later

#### Check list

1. Only work with the best varieties.
2. Work where the potential high yields are expected.
3. Watch stage of growth and disease symptoms; leaf rust—small brownish-orange eruptions, Septoria—flecking and dying of the leaf, similar to drought damage.
4. Make arrangements with your aerial operator.
5. Be sure aircraft can apply 5 gallons of water per acre.
6. Be sure that the aircraft has a good spray pattern. The application must be uniform.
7. Protect the crop—before the disease destroys the leaves—spray on time.
8. Be sure to measure the yield for your information.

#### Septoria leaf blotch—general

Sometimes called speckled leaf blotch because of the blotches it causes on the leaves and sheaths of the plant. It is considered to be a cool weather disease. Early in the season it appears as irregular, longitudinal spots with reddish-brown margins and ashen colored centers of various sizes scattered over the leaf surface. As the season progresses, the disease spreads from the lower leaves to the flag leaf by means of spores. The severely infected leaves may have a yellowish cast and die prematurely. In a normal year little new infection occurs after flowering time.

The fungus over-winters on old infected leaf debris in the field. Fungus spores are wind and water borne early in the season causing infection on susceptible crops and grasses.

#### Leaf rust—general

Often called orange leaf rust, it attacks wheat, barley, and oats (the latter is known as crown rust). As the name implies, it is found mainly on the leaves, but may be found on the stems, especially on that part of the stem between the head and the flag leaf. The disease appears as small round or oblong raised, orange-red spots on the surface of the leaf, the older leaves being attacked first. Early in the growing season, these spots are few in number and are scattered irregularly over the leaf surface. As the season progresses, the rust spreads from the older to the younger leaves, and may become very abundant.

The fungus spores that cause the initial infection are wind borne from southern wheat growing areas. Under optimum conditions a repeated set of summer spores can be produced in 7 to 14 days. These spores account for the rapid local spread of this disease.

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Mention of commercial names does not imply criticism nor does omission imply criticism.

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\*Early heading = when the head is beginning to emerge from the boot in ¼ of the plants.

