PP-894 (Revised) JANUARY 1990

COMMON BARLEY DISEASES IN NORTH DAKOTA

Hosts — Symptoms — Controls

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1. Common Root Rot

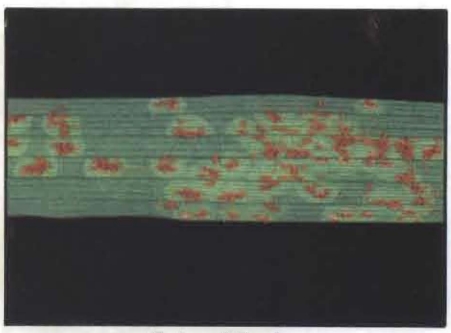
2. Spot Blotch

3. Net Blotch

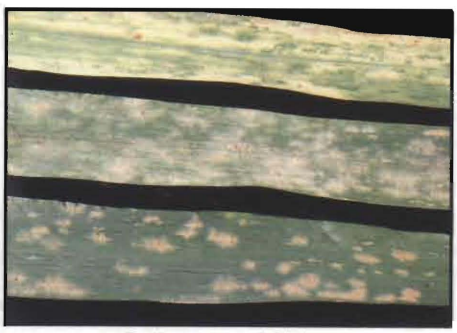
4. Septoria Leaf Blotch

5. Septoria Leaf Blotch

6. Scald



7. Leaf Rust



8. Powdery Mildew

9. Bacterial Blight

10. Barley Stem Rust

11. Scab or Head Blight

12. Covered Smut

13. Loose Smut

1. Common Root Rot (*Cochliobolus sativus*)

Hosts: Barley, spring wheat and durum. No variety is completely resistant, but some of the newer lines are more tolerant.

Symptoms: Diseased seedlings have dark brown spots near the seed or on stems below the soil line. Crown rot develops later in the season. In affected plants, kernels in the head are shriveled and roots are dark brown and rotted. Yields often are reduced by root rot even though symptoms are not well developed.

Controls: Promote rapid emergence by planting in well prepared, warm seed bed. Avoid herbicide stress. Rotate with crops such as oats, corn, flax or legumes if serious. Fungicide seed treatments also are available for suppression of common root rot.*

2. Spot Blotch (*Cochliobolus sativus*)

Hosts: Recently released barley varieties have good resistance. Spring wheat and durum are affected to a lesser extent.

Symptoms: Fungus spores produced on crop residue are carried by air currents to the leaves. Infections appear as dark, chocolate-colored blotches. The spots merge, eventually forming irregular dead patches on the leaves. Heavily infected leaves dry up completely, and infections on the flag leaf during kernel filling are the most serious.

Controls: Grow resistant varieties. Fungicides can be used on varieties that are more susceptible.* Rotate with crops such as corn, oats, rye, legumes or flax to reduce source of fungus spores from residue.

3. Net Blotch (*Pyrenophora teres*)

Hosts: Most current barley varieties are susceptible. Other crops are not affected.

Symptoms: A characteristic "netting" of the dark, chocolate-colored blotches on leaves, sheaths and glumes distinguishes this disease from spot blotch (No. 2).

Controls: Grow least susceptible varieties. Fungicide sprays will protect against infections.* Rotation with crops other than barley will reduce the amount of fungal spores residing in residue.

4. Septoria Leaf Blotch (*Septoria avenae* f. sp. *triticea*)

Hosts: All barley varieties are susceptible. Attacks springwheat, durum and some grasses.

Symptoms: Leaf spotting develops from infections by fungus spores produced on barley or wheat stubble and residue. Spots first show as small yellow flecks, later becoming tan with a yellow border. Spots are boat shaped at first then merge to form blotches. The margins of the spots are indefinite. Leaves dry and shrivel.

Controls: Minimize residue on soil surface of recrop land. Fungicides may be used to prevent infections.*

5. Septoria Leaf Blotch (*Septoria passerinii*)

Hosts: Current barley varieties are moderately resistant. Other crops are not affected.

Symptoms: The fungus causes yellowish to light brown elongated spots of varying sizes. Initially spots are long with definite margins parallel to leaf veins. Spots may merge and involve large areas of leaf tissue. Margins of leaf often pinch and dry. Small black fruiting bodies form in rows in diseased areas.

Controls: Grow the most resistant varieties. Use fungicides to protect leaves.* Bury infected crop debris. Use rotation with other crops.

6. Scald (*Rhynchosporium secalis*)

Hosts: All barley varieties are susceptible. Scald occurs primarily in the northern tier of counties.

Symptoms: Leaf spots develop during cool, wet weather. The spots are oval shaped and the margins of the spots change from bluish-green to zonated brown or tan rings, with bleached straw-colored centers.

Controls: Minimize residue on soil surface of recrop land. Rotate with other crops. Systemic fungicides are registered for control.*

7. Leaf Rust (*Puccinia hordei*)

Hosts: Barley. Most varieties are susceptible. Leaf rust has been a problem primarily on late-planted barley in northern counties.

Symptoms: Orange-red pustules erupting from the leaf surface contain spores which are spread by wind to other leaves.Heavily infected leaves die prematurely.

Controls: If conditions for epidemic development prevail, leaf rust can be controlled with systemic fungicides.

8. Powdery Mildew (*Erysiphe graminis f. sp. hordei*)

Hosts: Barley. Develops when cool, humid and cloudy weather persists.

Symptoms: White to gray powdery-surfaced lesions that are scattered on or completely cover the leaf blade, with associated yellowing, browning and drying of leaf tissue.

Controls: May be controlled with sulfur or systemic fungicides*, but the disease generally is not an economic problem in North Dakota.

9. Bacterial Blight (*Xanthomonas campestris pv. transluscens*)

Hosts: Barley, spring wheat, durum and grasses.

Symptoms: Linear water-soaked areas and exudate droplets develop on leaves after several days of rainy, damp weather. The lesions elongate and merge into irregular glossy-surfaced stripes.

Controls: Rotate to non-grain crop. Bury crop refuse. Use disease free seed.

10. Barley Stem Rust (*Puccinia graminis f. sp. tritici* and *f. sp. secalis)*)

Hosts: Barley and wheat (*Puccinia graminis f. sp. tritici*), barley and rye (*Puccinia graminis f. sp. secalis*).

Symptoms: Masses of brick-red spores (pustules) erupt primarily on stems and leaf sheaths, but leaf blades, glumes and awns may also be infected. Spores are easily spread by wind to other plants, and the disease is favored by warm, moist weather.

Controls: Most varieties are resistant to *Puccinia graminis f. sp. tritici,* but this resistance is sometimes less effective during periods of elevated temperatures. All commercial varieties are susceptible to *Puccinia graminis f. sp. secalis,* but this form is rarely found. Stem rust also can be controlled with systemic fungicides.

11. Scab or Head Blight (*Gibberella zeae*)

Hosts: Barley, spring wheat, durum and many grasses. It is important in the more humid areas of southeastern North Dakota.

Symptoms: Spikes are dwarfed and compressed and infected spikelets are closed rather than spreading. Hulls are light to dark brown often developing a yellowish or pinkish color during moist weather.

Controls: Do not grow barley following corn. Bury crop residues to minimize source of spores.

12. Covered Smut (*Ustilago hordei*)

Hosts: Barley varieties are moderately susceptible.

Symptoms: Masses of smut spores replace grain and glumes of barley heads. The black spores are covered by a grey membrane which breaks readily at harvest. The released spores are spread and become attached to the grain kernel surface.

Controls: Seed treatment. All recommended chemicals are effective.*

13. Loose Smut (*Ustilago nuda*)

Hosts: All barley varieties are susceptible to one or more races.

Symptoms: Masses of smut spores replace the entire head of plants. Smutted heads often emerge before healthy heads. Spores are dislodged and scattered by wind soon after emergence. The fungus infects open flowers and becomes established in the embryo of the developing seed. The State Seed Department tests for the presence of loose smut in barley seed.

Controls: Grow smut-free seed or treat seed with carboxin containing fungicides.*

*Information on specific chemicals registered for barley disease control can be obtained from North Dakota Extension Circular PP-622 (revised) "Field Crop Fungicide Recommendations," or by consulting the county extension office.

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