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EC 72-1858

SMALL GRAIN DISEASES

Louis T. Palmer and Eric D. Kerr
Agricultural Extension Plant Pathologists

1. LOOSE SMUT OF BARLEY: *Ustilago nuda* (Jens.) Rostr, *U. nigra* Tapke. Two loose smuts occur on barley in Nebraska. Loose smut *(U. nuda)* is first observed as head emerges from boot. Heads are replaced by a dark brown to black spore mass which, by harvest time, is a naked spike. Spores are enclosed for a short time in a delicate silvery membrane which soon ruptures, releasing spores which are blown by wind to healthy heads in bloom. The difference with *U. nigra* is in the life cycle where spores are scattered by wind and lie dormant on surface of kernel or remain in soil. Control: Seed treatment with systemic fungicide such as Vitavax will control loose smut of barley.

2. SCALD DISEASE OF BARLEY: *Rhynchosporium secalis* (Oud.) J. J. Davis. Scald spots occure on blades and sheaths of barley leaves as conspicuous blotches of varioussizes and shapes, generally elongated spots of ½ to 2 inches by ¼ to ½ inches wide. Spots begin as ovate or irregular blotches with water-soaked appearance and bluish-green color. As tissues die, center of spot becomes a light gray to tan color with a dark brown border. Control: sanitation, crop rotation and resistant varieties. Destroying perennial grass hosts helps to reduce inoculum.

3. ANTHRACNOSE OF RYE: *Colletotrichum graminicola* (Ces.) G. W. Wilson. Fungus causing anthracnose attacks roots, stems, leaves and heads. Disease becomes apparent as crop approaches maturity. First symptoms are premature ripening or dying of plants. Crown and bases of stems become bleached and turn brown. Purple-to-brown, water-soaked blotches are formed on leaves. Severe infections may result in shrivelled grain or head blight. Fungus can survive on crop residue. Incidence of disease is reduced by rotation of crops with legumes, improved soil fertility and sanitation. Seedling infection can be reduced by seed treatment and screening to remove light-weight infected seeds.

4. POWDERY MILDEW: *Erysiphe graminis* DC. f. sp. *tritici* E. Marchal on wheat. *Erysiphe graminis* DC. f. sp. *horedei* E. Marchal on barley. *Erysiphe graminis* DC. f. sp. *avenae* E. Marchal on oats. *Erysiphe graminis* DC. f. sp. *secalis* E. Marchal on rye. Fungus begins as small, irregular, light gray spots on upper surface of leaves. As fungus grows, spots enlarge and mycelium of fungus becomes visible as a white powdery mass on leaf. Later small black dots (fruiting bodies) appear in the mycelium. Affected leaves become deformed and drop prematurely. Control: resistant varieties are available and recommended for barley. No control for wheat, oats and rye.

5. SOIL-BORNE MOSAIC VIRUS: Common in Nebraska in wheat, oats, barley. Symptoms may appear in fall or spring but are most common early in spring when temperatures are 40-60° F. First symptom is a mosaic or mottling of leaves. Mottling consists of light green or yellow blotches which appear in long streaks. Plants may be stunted and develop rosette appearance. In susceptible lines, plants may die prematurely. Symptoms are detected early in spring when infected portion or field may appear as light green to yellow patches. Control of soil-borne mosaic virus can be achieved only with use of resistant varieties.

6. LEAF STRIPE OF BARLEY: *Helminthosporium gramineum* Rabh. Leaf stripe is first observed as small yellow spots on leaves of seedlings. Narrow, yellowish streaks or stripes appear on blade and sheath of leaf before heading. Yellow stripes change to a reddish or dark brown color along margin. Diseased tissues die and split between leaf veins. Diseased plants are stunted, usually sterile and frequently die prematurely. Fungus may survive in infected seed or overwinter on barley straw in field. Treating seed with a fungicide, planting resistant varieties and sowing seed when soil is warm (68 F or above) are control measures which will reduce incidence of disease.

7. HELMINTHOSPORIUM LEAF SPOT OF OATS: *Helminthosporium avenae* Eidam or *Pyrenophora avenae* Ito & Kuribay. Symptoms first appear as large red-brown spots on leaves of seedling plants. Spores produced in dead areas in center of these spots infect other leaves. Irregular brown-yellow or reddish spots or blotches occur on new leaves. Infected leaves shrivel and die, oat heads may become infected, roots are poorly developed and lodging may occur. Grain production is reduced. Fungus survives on grain and in crop refuse. Seed treatment, use of resistant varieties and crop sanitation will reduce disease intensity.

8. SEPTORIA LEAF SPOT OF WHEAT: (Speckled Leaf Blotch) *Septoria tritici* Rob. ex Desm. (Glume Blotch) *Septoria nodorum* (Berk.) Berk. Leaf diseases caused by *Septoria* species occur on many grasses. Two most important on wheat are speckled leaf blotch or spot and glume blotch. Symptoms are irregular red-brown spots of various sizes with minute black spore-producing bodies of fungus in center of spots. Leaves (especially lower ones) on infected plants may die prematurely, reducing yields. Speckled leaf blotch occurs more frequently on leaves. Glume blotch is most common on awns and glumes. Crop rotation, control of volunteer plants, seed treatment, seed cleaning, crop sanitation and use of tolerant varieties are means of reducing losses. Aerial spraying of Manzate 200 and Dithane M-45 fungicides will control *Septoria* leaf spot.

9. LEAF RUST: *Puccinia recondita* Rob. ex Desm. f. sp. *tritici* on wheat. Wheat, barley, oats, rye and other grasses are susceptible to leaf rust and each has a specific species of rust. The small round brown-red pustules (uredia) are most common on leaves and can be found anytime from seedling to adult stage. As plants mature fungus stops producing red spores and begins to produce black teliospores. The black spores germinate and infect meadow rue *(Thalictrum polygamum)* which is the alternate host of the fungus. Spores produced on meadow rue in turn infect wheat. The alternate host is of little importance since red spores are blown in each year from the south. Resistance offers the best method of control. Aerial application of Manzate 200 or Dithane m-45 fungicides will reduce losses.

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An Aid to Identification and Control

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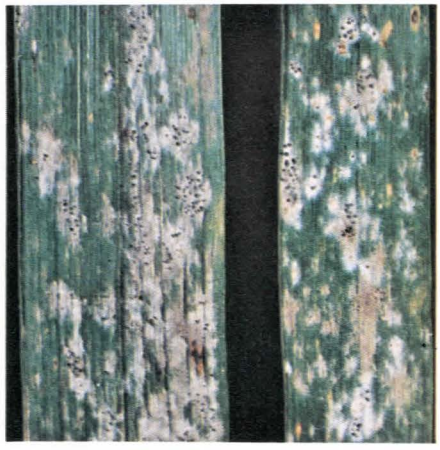
2. SCALD DISEASE OF BARLEY

3. ANTHRACNOSE OF RYE



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7. HELMINTHOSPORIUM LEAF SPOT OF OATS

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