

Corn Disease Profiles

EC1910

Diseases Favored by Dry Conditions

Nebraska Extension Plant Pathology Team

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1. Seedling and Root Rot Diseases



Fig. 1a. (left) Rotting Roots
Fig. 1b. (above) Damping Off

4. Rust Diseases

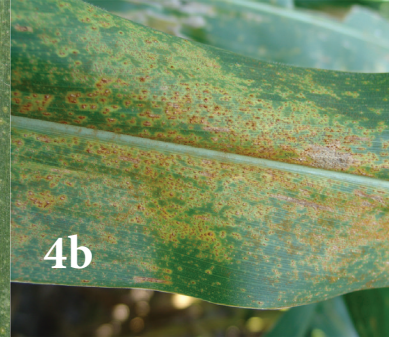


Fig. 4a. (left) Common Rust
Fig. 4b. (above) Southern Rust



Fig. 2. Nematodes



Fig. 3. Common Smut



Fig. 5. Charcoal Rot

6. Stalk and Crown Rot Diseases



Fig. 6a. (above) Stalk Rot
Fig. 6b. (right) Crown Rot



Fig. 7. Aspergillus Ear Rot

Diseases of Corn Favored By Dry Conditions

Extreme weather events are predicted to become increasingly common and could bring periods of drought, as well as intense rainfall events. Wet conditions are favorable for many plant pathogens and the development of diseases, but some diseases may also develop during or following dry weather. The timing during the season when dry conditions occur, as well as other factors, such as temperature, impact which diseases develop and when. The list below summarizes some of the most common corn diseases that can develop during dry conditions.

| Timing | Disease | Description |
|---------------------|---|---|
| Early Season | Seedling Root Rot Diseases <i>Fusarium</i> spp. and <i>Rhizoctonia solani</i> Management: C, F, N | Some seedling and root rot diseases can develop under a wide range of moisture conditions and temperatures, especially if plants are under stress. Symptoms can include lesions and rotting of roots (Figure 1a) and/or hypocotyls, as well as pre- and post-emergence damping off of seedlings (Figure 1b), stunting, yellowing, and reduced stands. |
| | Nematodes Multiple, such as: <i>Belonolaimus</i> spp. (sting); <i>Hoplolaimus</i> spp. (lance); <i>Pratylenchus</i> spp. (root-lesion); <i>Paratrichodorus</i> spp. (stubby-root) Management: C, N, Nema | Nematodes feed on roots every year, but the damage that they cause can be exacerbated by dry conditions and other crop stresses. Symptoms can include patches of stunted plants with discolored or decayed roots, sometimes with brown, sunken lesions, or misshaped roots that are stubby or branch excessively. Aboveground plant parts can be stunted, yellow, wilted, or show evidence of nutrient deficiency (Figure 2). Some nematode species can travel up to several feet deep during the season, so sample sandy fields during early season, by the sixth leaf (V6) corn. |
| Mid-Season | Common Smut <i>Ustilago maydis</i> Management: N | Common smut occurs in almost every field, every year. The fungus overwinters in the soil—surviving for many years—and infects plants through wounds or silks. Infection causes development of small to very large fleshy galls on any part of the plant (Figure 3). Large amounts of dusty black to dark brown spores develop inside the galls. Common smut incidence can be increased during very hot or dry weather. This leads to crop stress and prevents kernels from becoming pollinated, allowing silks to continue to grow with a longer period of time for fungal infection to occur. |
| Late Season | Rust Diseases <i>Puccinia sorghi</i> and <i>Puccinia polysora</i> Management: F, N | Rust diseases are caused by fungi whose spores do not overwinter in Nebraska, but instead must blow in from southern locations annually. Common rust often develops early in the growing season because it's favored by cooler temperatures (61-77 F). Southern rust usually develops during late summer (77-82 F). Southern rust can limit yield if it develops during grain fill. It abundantly produces orange spores, usually on the upper leaf surface. Common rust is less damaging on dent corn hybrids and produces brick red to brown spores in pustules on both upper and lower leaf surfaces (Figures 4a and 4b). High relative humidity inside the canopy is enough to support infection and reproduction of these fungi even in the absence of rainfall. |
| | Charcoal Rot <i>Macrophomina phaseolina</i> Management: N | Charcoal rot development is more likely during hot, dry growing conditions. The fungus survives in the soil as tiny black microsclerotia that can fill the roots and crowns in infected plants, giving them the appearance of charcoal dust (Figure 5). Affected plants are prone to lodging and may die prematurely. The fungus has a very wide range, including most other crops grown in Nebraska, such as soybean, alfalfa, sorghum, and sunflower. |
| | Stalk and Crown Rot Diseases Multiple, such as: <i>Fusarium</i> spp. Management: N | Stalk and crown rot diseases are usually caused by fungi that overwinter in crop debris or soil. Disease development is more likely following excessive fertilization or stressful growing conditions, such as inadequate moisture, wounding, and lost leaf area due to diseases or hail. This may lead to discolored, weakened, hollow stalks or crowns that are prone to lodging, resulting in harvest difficulty and plants that may die prematurely (Figures 6a and 6b). |
| | Aspergillus Ear Rot <i>Aspergillus flavus</i> Management: C, R, N | The fungus causing Aspergillus ear rot overwinters in crop debris and commonly infects ears through wounds often caused by insect feeding. Disease development and production of the mycotoxin aflatoxin are more likely following hot, dry weather conditions. The fungus produces olive to yellow green spores. This and other ear rot pathogens can continue to grow and produce mycotoxins in storage. |

*Management Codes: C—cultural practices, such as the use of crop rotation or tillage; F—fungicides; R—resistant hybrids; N—management may not be necessary, practical, or possible; Nema—nematicides.



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