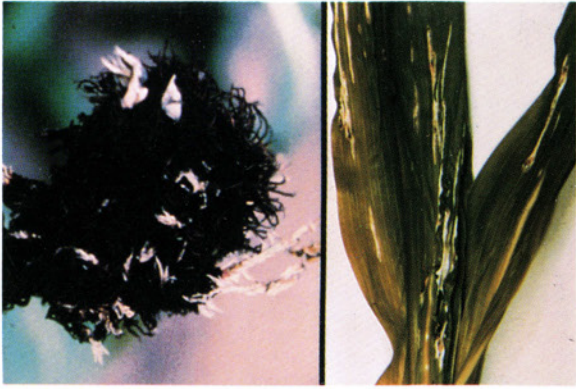


CORN DISEASES III



1. Head smut



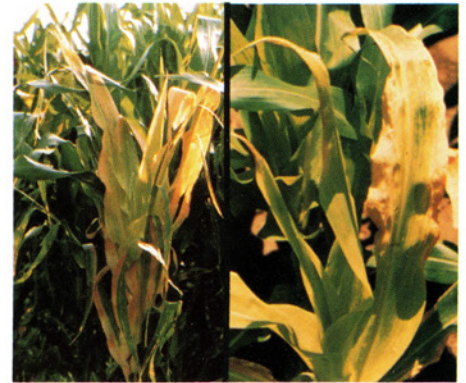
2. Penicillium kernel rot and seedling blight



3. Gray ear rot



4. Rhizopus ear rot



5. Lethal necrosis



6. Witchweed (*Striga*)



7. Chlorine injury



8. Fluoride injury



9. Bacterial stalk rot



10. Dinitroaniline injury: L & C. trifluralin (Treflan); R oxyzalin (Surflan)



11. Triazine injury: cyanazine (Bladex)



12. Benzoic acid injury



13. Benzoic acid (Banvel) & alachlor (Lasso) injury

CORN DISEASES III

1. **Head smut**, caused by the fungus *Sphacelotheca reiliana*, occurs periodically in the United States, mostly in the deltas and intermountain valleys of the Pacific Coast states and the high plains of Texas. Black dusty smut sori develop in the ear and less commonly the tassel and an occasional leaf. Infected tassels may appear shootlike or form bizarre structures. Smutted ears are rounded and lack silks. Plants with smutted tassels may be severely dwarfed. Excess tillering is common. Head smut is accentuated by nitrogen deficiency and dry soils. The *Spacelotheca* fungus overseasons in soil and systemically infects plants in the seedling stage when soil temperatures are 71° to 82°F (21° to 28°C).

2. **Penicillium kernel rot and seedling blight** is caused by several species of the fungus *Penicillium*, especially *P. oxalicum*. This disease occurs primarily on ears injured mechanically or by insects. A powdery, green or blue-green mold forms on and between the kernels, usually at the ear tip. "Blue-eye" rot occurs on stored grain with a high moisture content. Infected kernels normally become bleached and streaked. Species of *Penicillium* can invade seed embryos and cause seedling blights on germination. Dead areas in the seedling leaves are blue-green at first, then turn drab or light brown. Infected seedling tissue is soft and often water soaked. *Penicillium* fungi are both seed- and soil-borne.

3. **Gray ear rot** is an uncommon disease caused by the fungus *Botryosphaeria (Phylospora) zeae*, asexual state *Macrophoma zeae*. A grayish white mold forms on and between the kernels near the ear base and may resemble the more common Diplodia ear rot. Early infected ears have tightly adherent husks. At harvest, such ears stand upright and are shriveled and slate gray to black instead of a grayish brown as in Diplodia ear rot. Severely infected kernels have slate gray to black streaks or specks under the pericarp. Small black sclerotia can often be seen scattered throughout the cob. Disease development is favored by extended periods of warm to hot wet weather after silking. The fungus overseasons on infected leaves and rotted kernels and ears. Spread occurs primarily by wind and rain.

4. **Rhizopus ear rot** or mold, caused by several species of the fungus *Rhizopus*, appears as a white mold in which many dark dots (sporangia) are just visible to the naked eye. Sometimes the sporangia are so numerous that they give the mold a peppery gray appearance. Kernels on *Rhizopus*-affected ears do not show much discoloration and the germ (embryo) area may take on a slightly smoky opalescence; but not a serious rot. *Rhizopus* is conspicuous on corn ears only following a hot, dry summer.

5. **Lethal necrosis** results from the interaction of maize chlorotic mottle virus (MCMV) with various strains of either maize dwarf mosaic virus (MDMV-A and -B) or wheat streak mosaic virus (WSMV). The disease was first described in 1976 and has been reported mostly from Kansas and Nebraska. Yield losses in severely affected fields have been estimated at 50 percent or more. Symptoms include a severe yellow (chlorotic) mottling followed by a browning of the leaves and early death of plants. Leaf killing progresses inward from the margins. In maturing plants, tissue death usually starts at the tassel and progresses downward. Virus transmission occurs by the feeding of various beetles for MCMV, aphids for MDMV, and the wheat-curl mite for WSMV.

6. **Witchweed** (*Striga asiatica* (syn *S. lutea*) and *S. hermonthica*) is a parasitic flowering plant that occurs in a few restricted areas of North and South Carolina, and in many tropical and semitropical areas of the world. Losses vary with the degree of field infestation, ranging from a trace to total. Infected corn plants wilt and turn yellow resembling acute drought. One to several witchweed plants may grow above ground next to an infected corn plant. Below ground, fleshy stems of witchweed plants are attached to the corn root system. Roots of many witchweed plants may parasitize the same corn plant. *Striga* plants are slender and erect with square stems and small, bright green, elongated leaves. Plants seldom grow more than 7½ to 15 inches tall and form tubular flowers that are brick red, yellowish red, pink, lemon yellow, or almost white. A single *Striga* plant can produce up to half a million seeds which are disseminated by contaminated soil on machinery, equipment, tools, water, or wind. Seeds may lie dormant in soil for 15 to 20 years.

7. **Chlorine injury** appears as interveinal, tan yellow, dead (necrotic) streaks in the leaves. Middle aged or older leaves are more susceptible to injury than are young leaves. Chlorine injury is found near chemical and water treatment plants, glass or ceramic factories, and where plastics are incinerated.

8. **Fluoride injury** develops as a yellowish mottle or "flecking" along the leaf margins and tips. Small, irregular, chlorotic spots develop between the veins and may form continuous yellowish bands. More severe injury causes an interveinal and marginal chlorosis with some areas turning brown (necrotic). Zinc or potassium deficiency, mite injury, genetic variation, or normal senescence produce symptoms that resembles fluoride injury. Look for this injury near production facilities for aluminum, steel, ceramics, phosphorous chemicals, and fertilizers.

9. **Bacterial stalk rot**, caused by *Erwinia chrysanthemi* pathovar *zeae* (syn. *E. carotovora* var. *zeae*), is most prevalent in areas with high rainfall, on land subject to flooding, and where irrigation water is drawn from sources of surface water. It usually appears in midseason when affected plants suddenly topple over. One to several internodes above the soil line appear tan to dark brown, water soaked, soft to slimy, and collapsed. Infected tissue has a foul odor. Diseased plants may remain green for several days because the vascular strands within the stalk remain intact. A top and stalk rot occurs in plants sprinkler-irrigated with surface water. The tips of the upper leaves wilt, followed by a slimy soft rot at the base of the whorl. Collapsed, twisted stalks are a good indication of this disease. The bacterium overseasons on crop residue in soil.

10. **Dinitroaniline injury** causes a reduction in the stand population, stunting or uneven plant height, and a purpling of leaves. Roots on affected plants are somewhat pruned and appear "clubby" at the ends. Major damage usually occurs from a carryover of herbicide residue. Different dinitroanilines—which include pendimethalin (Prowl), trifluralin (Treflan), oxyzin (Surflan), fluchoralin (Basalin), and ethalfluralin (Sonolan)—vary in their persistence in soil. Control measures involve accurate and uniform application based on soil texture and percent organic matter. Corn should be planted in soil treated with a dinitroaniline herbicide ONLY after sufficient time and rainfall has occurred as outlined on the container label.

11. **Triazine injury** appears as a gradual interveinal yellowing or chlorosis. Leaves may die back from the tips and turn light brown. Plant height within a field may be highly variable. Where severe, plants may be killed. Injury from soil applied triazine herbicides—which include atrazine (several brand names) or atrazine plus oil, cyanazine (Bladex), simazine (Princep), and ametryn (Evik)—may occur on sandy soils low in organic matter or due to excessive rates, cool wet weather, a high soil pH, or other factors adversely affecting the plant's metabolism. Injury from foliar applied triazines appears as a chlorosis of leaves contacted, moving to the leaf tips which may die (become necrotic). Control is the same as for dinitroaniline injury.

12. **Benzoic acid injury** appears as an "onion leafing," proliferation of inhibited roots, abnormal brace root formation, or fasciation. Lodging may occur following postemergence applications. Benzoic acid or dicamba (Banvel) injury resembles that produced by 2,4-D. Control by applying the correct rate uniformly and accurately as the label directs. Do NOT apply to sandy soils or soils low in organic matter. Create conditions favorable to rapid emergence and vigorous growth.

13. **Benzoic acid and alachlor injury** may occur following preemergence application, or a split application—preemergence with alachlor (Lasso), and postemergence with dicamba (Banvel), especially when unfavorable environmental conditions (e.g., cool wet weather) exist during seedling emergence. Banvel and Lasso combinations should be applied at the rate recommended on the label. Do NOT apply to sandy soils or soils low in organic matter. Corn hybrids differ in their susceptibility.

For chemical control suggestions, a listing of resistant varieties, and other control measures, consult the Extension Plant Pathologist at your land-grant university, or your county Extension office.