

# CORN DISEASES IV

(Disorders)



1. Flooding damage

2. Crust injury



3. Cold injury

4. Freeze damage



5. Drought injury

6. Heat scald

7. Poor pollination

8. Wind injury



9. Hail damage

10. Bipyridilium (Paraquat) injury

11. 2,4-D injury



## CORN DISEASES IV (Disorders)

1. **Flooding damage** is common in some areas almost every year. The lower leaves of young plants in water-logged soils turn yellow and die due to oxygen starvation when the roots are exposed to excess water. The crown area may be discolored and die. Plants up to 10 inches tall have a low tolerance to wet or flooded soils since the growing point is still below the soil surface. Older plants with secondary roots can withstand "wet feet" much better although the root systems may be shallow, dense and abnormal. Flooding damage is quite variable depending on the temperature and the length of time the plants were in saturated soil. Maximum damage can be anticipated when temperatures are high and flooding persists longer than 48 to 72 hours. Under cool conditions, plants may survive up to 96 hours or more depending on their age.

2. **Crust injury** commonly follows beating rains on fine-textured soils. Such a hard crust may form that seedlings have difficulty penetrating it. Shoots commonly twist underground due to surface crusting and develop twisted and folded leaves. Damage from acetanilide (Lasso, Dual Ramrod, Bexton) herbicides is similar and is more pronounced where a soil crust and cool weather persists. Dyfonate, Mocap, or Thimet applied in the seed furrow causes similar injury.

3. **Cold injury** occurs when chilly (41° to 59°F), clear, dewy nights are followed by clear, sunny mornings. Irregular, light gray to silvery blotches appear on both leaf surfaces on the east side of affected plants. Plants appear healthy when viewed from the west. This condition is quite common when the plants are 10 to 18 inches tall. Another symptom of low-temperature injury is the appearance of yellow bands across one or more leaves on young plants.

4. **Freeze damage** is most severe on high organic (muck and peat) soils and is most prevalent in low-lying areas of fields. Young corn plants are sometimes killed by a hard frost or freeze. Damaged tissue is water soaked and dark green at first before drying and turning brown. When the growing point is still underground, only the leaves are usually killed and the injured plants normally recover. Resident bacteria (including *Pseudomonas syringae* and *Erwinia herbicola*) serve as ice nuclei on the surfaces of seedling corn leaves. The severity of frost damage increases as the density of bacterial cells increases. Freezing of corn seeds results in lowered germination and vigor.

5. **Drought injury** appears as a rolling upward and inward of the upper leaves of young corn plants. The rolled leaves appear dull. On young plants that have sufficient nitrogen but lack moisture, the leaves roll and become dull but do not turn yellow. In older plants, drought produces nitrogen deficiency even if enough nitrogen was applied. Severe stunting and irregular brown or tan patches of dead leaf tissue may develop, especially under marginal and drought conditions. Seedlings may die, especially in a loose, coarse seed bed and where the seed is located in moist soil, the first node is in dry soil, and the mesocotyl rots. Dry surface soil, shallow planting, and the lack of crown root development results in poor emergence or young seedlings die. If "drought" symptoms appear in irregular patches of fields, nematode damage should be suspected.

6. **Heat scald** is usually associated with low soil moisture and hot dry winds. Temperatures from about 100° to 115°F cause scalding of corn leaf tissues. The uppermost leaves are first chlorotic, then roll and become bleached. Corn hybrids and varieties differ greatly in their tolerance to high temperatures.

7. **Poor pollination** is commonly due to excessive heat, often combined with hot dry winds and drought, during pollen shed. Poor pollination may also result from adult rootworms eating of the silks, poor timing of silking and pollen shed, aphid or herbicide damage, low fertility, and high plant populations.

8. **Wind injury** causes several types of damage to corn plants 4 to 10 inches tall. Leaf tips and edges turn white, then brown. Strong winds may carry sand and soil particles that make abrasions on seedling leaves or stalks on the windward side. Plants may also break or be injured below the soil line hampering growth. A broken ring may form around the hypocotyl just below the soil line. Such seedlings have purple or reddish purple leaves as with phosphorus deficiency. Shredding of old and young plants commonly occurs in areas where high winds prevail. Secondary roots are broken off (stubby) and do not become established in the soil. Plants lodged before complete establishment of the brace roots (and growth) may exhibit a broken or bowed stalk that tends to make harvesting and walking between the rows difficult. Plants lodged after full attainment of growth may not recover.

9. **Hail damage** is easily recognizable by shredded and broken leaves that hang in tatters. Plants up to about 10 inches tall may be completely broken or cut off. (At this stage hail injury may resemble cutworm or armyworm damage, but hail damage is usually more ragged in appearance.) Nonetheless, hail-injured plants may produce a near normal crop since the shoot apex when plants are under about 10 inches tall is still below the ground line. Hail may also wound stalks and ears allowing common smut, as well as stalk- and ear-rotting fungi, easy entrance. Ear rots are most severe when kernels are damaged in the milk stage. Loss of leaves when the grain is filling predisposes plants to stalk-rotting organisms.

10. **Bipyridilium (Paraquat) injury** usually appears as light brown flecks and spots, round to elongated oval in shape, where leaf tissue is contacted by spray droplets. The spots often superficially resemble one or more bacterial and fungal leaf blights. The spots usually decrease in size and number with an increasing distance from the point of application. The control is to prevent spread from adjacent fields and non-crop land and to use the correct rate applied uniformly and accurately as a directed spray. Paraquat is a nonselective contact herbicide not recommended for postemergence use in corn. Damage depends on the stage of growth and the amount of leaf tissue destroyed. Little loss occurs unless more than 10 percent of the leaf area is destroyed.

11. **2,4-D injury** may appear as a severe stunting and malformation of both the roots and shoots when it is applied before the seedlings emerge. Goosenecked or bowed corn may also be the result of rootworm larvae damage. Postemergence directed sprays may cause fasciation and upcurling of the brace roots. Applied "over-the-top," especially on a hot day, 2,4-D may cause the stalk to be brittle and break at a lower node. Occasionally, a new leaf will not unfurl (onion leaf). When applied near tasseling or at silking time, 2,4-D may interfere with seed set. Corn inbreds, hybrids and varieties differ in their susceptibility. The control is to use the correct rate of herbicide applied uniformly and accurately and when the label directs.

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

Photo credits: W. O. Scott (1L, LC and R, 2, 5, 7), University of Illinois (IRC, 6), M. C. Shurtleff (3L, 4L, 8R, 9L), D. C. Arny (3R, 4C and R), B. J. Jacobsen (8L, 9R), G. W. Simone (9C), Nora Simkus (10), D. R. Wilkinson (11).

Vocational Agriculture Service provides equal opportunities in programs and employment.