

Lect. 6

Corn Diseases

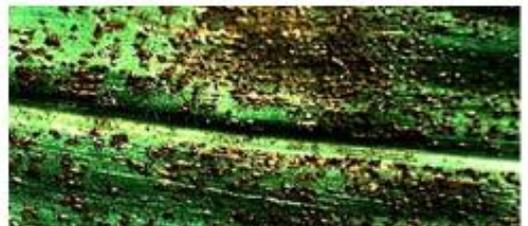


Common Rust (*Puccinia sorghi*)



Symptoms:

- Initial symptoms are chlorotic flecks on leaf surfaces.
- Flecks develop into oval to elongate reddish brown powdery pustules (urediniospores) on leaf surfaces.
- Spores break through the leaf epidermis.
- Pustules become dark in color later in the season as (teliospores).



Risk factors:

- Disease is favored by high relative humidity (>95%) and cool temperatures (16°C to 24°C).
- If environmental conditions are favorable, new urediniospores can be produced every 7 to 8 days after initial infection.

Management:

- Plant early to avoid high spore levels of the fungus later in the season.
- Plant resistant hybrids.
- Apply fungicides

Common smut

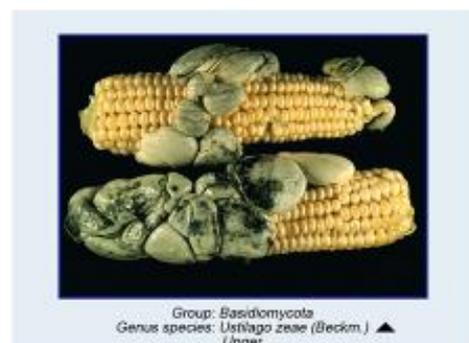
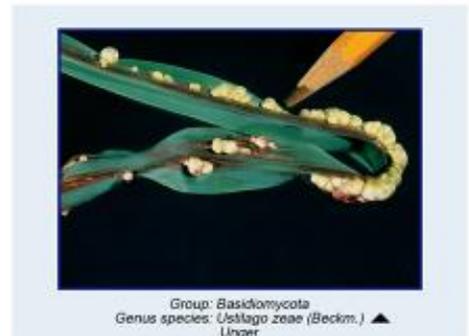
Pathogen: Fungus- *Ustilago maydis*

HOSTS: Maize (*Zea mays*),



Symptoms:

- Large galls - primarily on stalks or ears, but may be on leaves.
- Galls are covered with white or greenish-white tissue.
- Interior will darken and turn to a powdery, black mass of spores.
- Galls on the leaves usually remain small, hard and dry.



It is present in nearly all countries where corn is grown

Infection:

The plant may be infected at any time in the early stages of its development.

more common on the ears

Dispersal:

The smut spores are blown long distances by the wind.

Environmental conditions:

- Hot dry seasons are favorable for the growth of the fungus.
- High temperature usually is favorable for the germination of the spores.
- The spores, however, must have water collected in the leaf blades, and other parts of the corn to permit the required amount of growth for penetrating the tissue.

Management:

- Use resistant varieties.
- Avoid injury of roots, stalks, and leaves during cultivation.
- Deep plow diseased corn stalks to bury surviving spores.
- Apply fungicides
- Application of insecticides when insect populations are high.

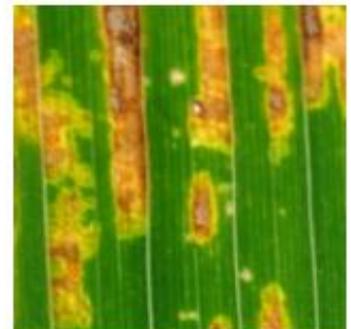
Corn Leaf Blight

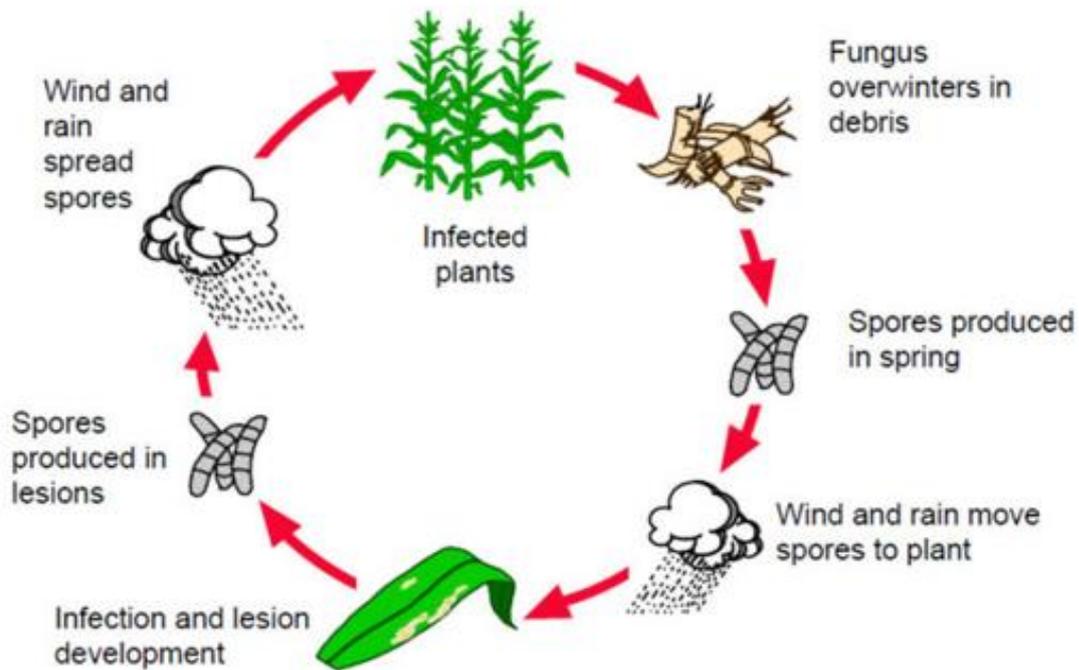
Pathogen: Fungus. *Bipolaris maydis*



Symptoms:

- Common lesions are elongated, tan lesions between veins on leaves.
- First on lower leaves, tan, lesions that have brown borders on leaves.





Life cycle of *Bipolaris maydis*

Conditions:

Favored by extended warm, wet, humid weather, minimum tillage, continuous corn.

Inoculum Survival:

Infected crop residue (leaves, leaf sheaths).

Inoculum Dispersal:

Airborne spores.

Management:

- Resistant cultivars.
- Foliar fungicides
- Plow under infected residue

Fusarium Ear Rot *Fusarium moniliforme*

occurs in all areas where maize is grown



Symptoms:

- Symptoms vary depending on the maize genotype, environment and disease severity.
- Individual or groups of infected kernels are usually scattered randomly on the entire ear and they appear as whitish and pink kernels (**Photo 2**).
- Fungal growth is frequently found on the tip of the ear as a result of stalk borer damage (**Photo 3**).
- Symptoms also occur where seed coats are broken
- In severe cases, the whole ear may be whitish on and between kernels.



Environmental conditions:

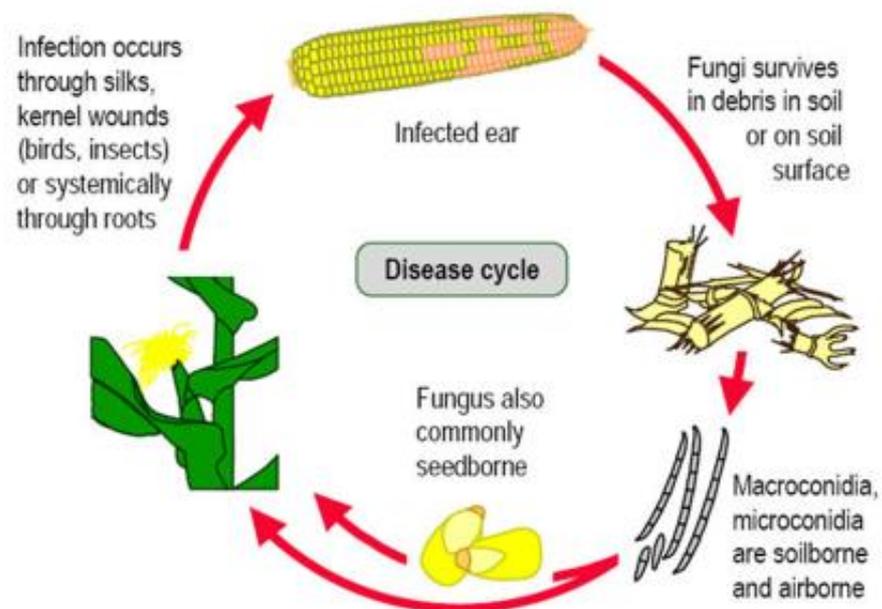
most severe under hot, dry weather conditions that occur after flowering.

Survival:

- Survive in maize stalks as hyphae
- The soil borne hyphae
- The fungus also produces airborne spores from previous crop residue.

Infection:

- Infect both through contaminated seed,
- As well as through airborne spores.



Control:

- Less susceptible cultivars
- Agricultural practices
- control of ear feeding insects
- avoiding excessive plant populations
- maintaining adequate levels of nitrogen and other essential growth nutrients
- crop rotation
- Seed treatment

Stewart's Wilt (*Pantoea stewartii*)



Symptoms:

Two phases occur depending upon time of infection.

Seedling wilt occurs when seedlings of susceptible hybrids are infected systemically.

Leaf blight occurs after tassel emergence.

Systemic infections

Less common than foliar phase
may result in a range of symptoms:

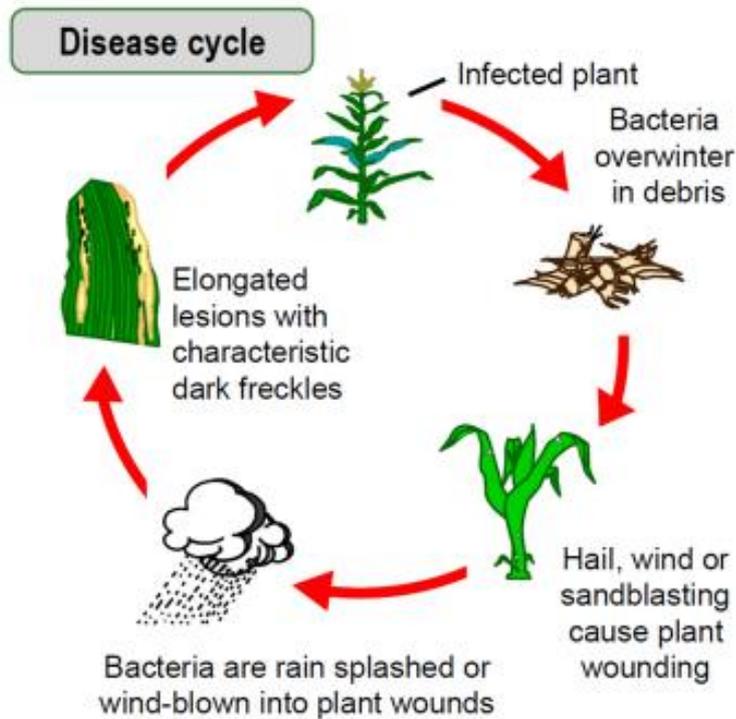
- stunted, wilted and/or discolored
- Can cause large losses, especially in susceptible hybrids
- May cause plant death
- Plants wilt due to vascular infection with bacteria
- Vascular bundles may have orange coloration that turns brown to black after disease progresses



Leaf blight symptoms include

- pale-green to yellow, linear, - elongated lesions (streaks) with irregular or wavy margins that run parallel to the veins
- can result in dead tissue with age.
- is often associated with feeding wounds caused by flea beetles.





Inoculum Dispersal:

- Insect vector (corn flea beetle)
- infected seed.



Management:

- Plant resistant hybrids.
- Control flea beetles
- when planting susceptible hybrids: insecticides applied as a seed treatment have been shown to provide more consistent control than foliar applications.

Bacterial Stalk Rot

Pathogen name: *Erwinia chrysanthemi*
pv. *zeae* (Sabet)



Symptoms:

- One or more of lowest internodes will turn to brown and become water soaked, soft, or slimy and there may be a foul odor.
- Upper leaves wilt and a soft rot can occur at the base of the whorl, and this may spread rapidly down the plant and cause lodging



Control:

Rotate crops
Destroy crop residue.
Plant resistant varieties.
Fertilize properly.
Proper planting dates.
Treat seed.

T.A.