

## 2006 Florida Plant Disease Management Guide: Sweet Corn<sup>1</sup>

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### Specific Common Diseases

#### Bacterial Leaf Blight (*Pseudomonas avenae*)

**Symptoms:** Incited by a bacterium, bacterial leaf blight is characterized by sharply delineated dead spots and stripes on the leaf. These may measure about 1/16 inch wide and up to several inches long. The spots initially appear water-soaked, turn brown, and then white to gray. Newly-formed lesions typically occur on leaves as they emerge from the whorl, with little elongation once the leaf is fully expanded. Bacterial blight rarely advances once the corn has tasseled.

**Cultural Controls:** Since severe bacterial blight has been observed to follow heavy budworm infestations, good insect control may aid in lessening the disease. Additionally, since the bacterium may survive on grassy weeds, particularly Vasey grass, control of such weed hosts, particularly along ditch banks, is often beneficial. The disease is favored by warm, wet conditions. Some varieties are more resistant to bacterial blight than others and these should be considered in disease prone areas.

#### Bacterial Stripe (*Pseudomonas andropogonis*)

**Symptoms:** Primary lesions are typically amber-to olive-colored, with parallel sides. Lesions usually elongate, giving a stripe appearance, and may coalesce. Unlike bacterial leaf blight, bacterial stripe symptoms appear first on the lower leaves and spreads upwards. Leaves superior to the ear are seldom affected and therefore bacterial stripe is seldom of economic importance.

**Cultural Controls:** Bacterial stripe, like bacterial blight, is most severe under warm wet conditions. It also survives on weed hosts such as Johnsongrass and Sudangrass. Resistant varieties and proper weed control will reduce disease incidence.

#### Common Rust (*Puccinia sorghi*)

**Symptoms:** Common rust is a fungal disease characterized by small, circular to elongate, reddish brown to dark brown pustules on the leaf surface. Common rust pustules are frequently erumpent on both the upper and lower leaf surface. Pustules give rise to tens of thousands of cinnamon brown spores

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which are easily dislodged during periods of reduced humidity. When severe, common rust may cause extensive yellowing and premature desiccation of corn foliage, resulting in leaf necrosis. In extreme cases, heavy rust infestations may result in stunting, incomplete ear tip fill, and pustules on ear husks, reducing marketability.

**Cultural Controls:** Common rust, because it is favored by cool to moderate temperatures (60-73° C), is most prevalent during Florida's spring growing season. It is seldom a problem during the fall in Southern Florida when southern rust is the more prevalent rust disease. During the late 1980s and throughout the 1990s, common rust was the most important disease of Florida sweet corn. New varieties, specifically bred for rust resistance, have proven to be very beneficial in the control of this disease.

**Chemical Control:** Early detection is extremely important in initiating a chemical control program for rust. Since the fungus produces millions of spores which are wind-disseminated over large areas, rust may build up to high levels in a very short time. The newer strobilurin and sterol-inhibiting fungicides, which have some systemic properties, are more effective in controlling rust than the broad spectrum protectants. However, they should be used in a program (either tank-mixed or alternated) with the protectants to minimize the development of resistant strains of the rust fungus and to maximize efficacy. See PPP-6.

#### **Damping-Off (*Fusarium* spp., *Penicillium* spp., and *Pythium* spp., and *Rhizoctonia solani*)**

**Symptoms:** A number of soilborne fungi may infect the seed or seedling, causing them to rot or to die shortly after germination. Affected seed kernels are soft, and deteriorate in the soil. Seedlings that do emerge may show chlorosis or tip burn of the seed leaf as well as the first true leaves. Many of these will die, falling over at the soil surface. Root systems of affected plants will show dark lesions on roots and/or the coleoptile. See Plant Pathology Fact Sheet PP-1.

**Cultural Controls:** Damping-off is most prevalent when soils are cold and wet. Any condition that delays emergence will enhance disease incidence and severity. Plant in warm, well-drained but moist soils when possible. Use quality seed of high germination and avoid mechanical injury to the seed when planting.

**Chemical Controls:** Seed-protectant fungicides, including some of the standard protectants (i.e. captan and thiram) and some of the newer systemics can provide excellent control of damping off. Planting only seed which has been commercially treated with combinations of these compounds greatly enhances the opportunity for excellent stand establishment, particularly during cool, moist soil conditions.

#### **Maize Dwarf Mosaic (*Maize Dwarf Mosaic Virus*)**

**Symptoms:** Although there are a number of viral diseases of sweet corn, *maize dwarf mosaic virus* (MDMV) is the most common in Florida. Symptoms are highly variable. Leaves may have irregular, light and dark green mottle or mosaic patterns. These may develop as narrow, light green or yellow streaks along the veins. Infected plants may become stunted with a resulting reduction in ear size and development.

**Cultural Controls:** MDMV is retained and transmitted in a non-persistent manner (up to 6 hrs) by over 20 species of aphids. There are also over 200 wild and cultivated grass hosts for this virus. It causes an economic problem in Northern Florida. Resistant varieties are currently under development. Because Johnson grass is a major host for this virus, Johnson grass must be eliminated around and in fields used for production of sweet corn.

#### **Northern Corn Leaf Blight (*Exserohilum turcicum*)**

**Symptoms:** Along with common rust, this is one of the most important diseases of sweet corn in Florida. This fungal disease is characterized by long, spindle-shaped lesions which are at first pale green, gradually turning gray-brown with age. Lesions may eventually be up to 1/2 inch wide by 4-6 inches long.

Under favorable conditions, numerous lesions may coalesce to kill large amounts of foliage. The disease usually starts on the oldest leaves and works its way up the plant. The causal agent produces tiny stalks that emerge from the stomates located within the lesion area to give rise to long, multi-celled spores. These may be observed using a hand lens after periods of high humidity.

**Cultural Controls:** *Exserohilum turcicum* is favored by moderate temperatures (65-80° F) and periods of prolonged leaf wetness. It is slowed by periods of extended dryness. If the disease is well established prior to silking, economic losses may ensue. Lesions on ear husks also reduce marketability of sweet corn intended for the fresh market. Resistant hybrids are currently available to aid in the control of northern blight and are highly recommended, particularly for the spring growing season. Northern blight is seldom a concern in the fall in southern Florida, when southern corn leaf blight is more prevalent.

**Chemical Control:** Fungicides can be effective in helping to control this disease. A forecasting system based upon leaf wetness and temperature is helpful in determining infection periods. While sterol-inhibitor and strobilurin fungicides are more effective than protectant fungicides in the control of northern blight, these should be utilized in a program with the broad-spectrum protectants to reduce the risk posed by the development of fungicide insensitivity. See PPP-6.

### **Smut (*Ustilago maydis*)**

**Symptoms:** All plant parts above ground may be infected, especially actively growing meristematic tissue. The causal fungus produces spore-filled galls which are initially greenish to silvery white. The interior of the gall turns into a brown to black powdery mass, as the spores mature. Galls may range from 1/2 inch to 6 inches in diameter. Young plants may die but this is infrequent. Leaf galls usually remain small (1/4 to 1/2 inch in diam.) and become hard, but seldom rupture.

**Cultural Controls:** Unlike most fungal diseases, smut is favored by dry conditions. Favorable temperatures range from 78 and 94° F. Since the

disease appears to be more severe when high nitrogen fertility or heavy manure amendments are used, maintain a balanced fertility program. Smut is also favored by injuries due to hail, blowing sand, and mechanical factors. Therefore, mechanical injuries caused by cultivation and spraying should be minimized. Where smut is a consistent problem, choose varieties with generalized or polygenic resistance to the causal fungus.

### **Southern Corn Leaf Blight (*Bipolaris maydis*)**

**Symptoms:** Lesions caused by southern corn leaf blight are much smaller (up to 1/2 inch wide and 1 inch long) than those incited by northern corn leaf blight. Southern blight lesions are also lighter in color (light tan to brown), and have parallel sides rather than the tapering sides of lesions caused by *E. turcicum*. When severe, lesions may become so numerous that they coalesce and turn the entire leaf necrotic. Southern blight, like northern blight, moves from the lower canopy to the upper canopy. Fungal sporulation may be observed with a simple hand lens on foliar lesions following periods of high humidity.

**Cultural Controls:** Southern corn leaf blight is most prevalent during the fall growing season in south Florida, but may also appear at the end of the spring growing season, particularly if unseasonably warm. It is favored by warm to hot temperatures (68-90° F) and periods of extended leaf wetness. Resistant varieties are available and should be considered, particularly for fall plantings.

**Chemical Control:** Fungicides can be effective in helping to control this disease. These should be applied early, particularly if the forecast is for warm, humid weather. As with northern corn leaf blight, the sterol inhibitors and strobilurin fungicides are most efficacious. However, these should be utilized in conjunction with a broad spectrum protectant to minimize development of fungal insensitivity. See PPP-6.

### **Southern Rust (*Puccinia polysora*)**

**Symptoms:** Like common rust, southern rust is characterized by pustules which erupt on through the foliar epidermis. However, southern rust pustules are more orange than brown, more circular than elongate,

and are more prevalent on the upper leaf surface than on the lower leaf surface. Given favorable conditions, southern rust may cause premature death and desiccation of corn leaves. In addition, plant photosynthates intended for ear fill are diverted to the pathogen for spore production, resulting in incomplete ear tip fill. Most prevalent in fall sweet corn in south Florida, southern rust is occasionally of economic importance and warrants control.

***Cultural and Chemical Controls:*** Southern rust, in contrast to common rust, is favored by warm to hot temperatures (80-90° F). It too likes high humidities and long periods of leaf wetness. Hybrids resistant to southern rust are not as numerous as those resistant to common rust. Therefore, growers may have to rely more on fungicides for control if conditions are favorable. Growers should scout fields and begin fungicide applications during early stages of the disease. As with common rust, the newer strobilurin and sterol-inhibiting fungicides, which have some systemic properties, are more effective in controlling rust than the broad spectrum protectants. However, they should be used in a program (either tank-mixed or alternated) with the protectants to minimize the development of resistant strains of the rust fungus and to maximize efficacy. See PPP-6.