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Major Blights of Melons and Cucumbers in Indiana

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Growing conditions in Indiana are often ideal for one or more of five distinct blights of muskmelons, watermelons and cucumbers. Any of these five blights may be found in Indiana during a portion of the season or in some cases throughout the season, when seasonal climatic conditions include warm, humid weather with excessive rainfall and high relative humidity. Good control of these blights can generally be achieved through repeated applications of a suitable fungicide. A sixth disease, bacterial wilt, depends upon cucumber beetles for its spread, and control of this disease is accomplished by applications of insecticides.

Alternaria Leaf Spot (Rust), caused by the fungus Alternaria cucumerina, is commonly observed on melons and cucumbers grown in sandy or low-organic soils deficient in nitrogen. High humidity and frequent rainfall favor the development of this foliar disease. Small, tan, often water-soaked, spots first appear on older or crown leaves near the center of the hill. Under warm, humid conditions, spots appear on younger leaves at the tips of vines. Spots enlarge rapidly to form dark brown round to irregular lesions 1/8 inch or more in diameter. Lesions may coalesce, killing large areas of leaf tissue. Severely infected leaves curl, dry, and fall prematurely. Vines may be completely defoliated at harvest. Melons ripen more rapidly and are smaller in size and of lower quality when plants are defoliated. Fruit infection results in circular sunken lesions which are often covered with a dark olive green or black mold.

Angular Leaf Spot, caused by the bacterium Pseudomonas lachrymans, can severely injure slicing and pickling cucumbers during periods of frequent rainfall. Although most serious on cucumbers, zucchini squash, and honeydew melon, angular leaf spot will infect most other cucurbits. First symptoms of infection are small angular water-soaked lesions on infected leaves. The lesions are generally angular because of confinement between small leaf veins. Lesions are tan on their upper surfaces and gummy or shiny underneath. In the early morning when dew is still present, tear-shaped droplets of bacterial oozes are commonly observed on the underside of infected leaves. Infected leaf tissue may dry and tear away from healthy tissue giving the leaf a tattered appearance.
Circular water-soaked lesions may be found on fruits. Generally the diameter of these lesions is smaller than lesions on the foliage. As fruit lesions mature, the centers become chalky white and may crack open, thus allowing entrance of secondary, soft-rotting organisms into the fruit. The disease is seed-borne and persists in the soil in infected plant debris. Cucumber seed produced in dry areas of California may be free of angular leaf spot.

Anthracnose, caused by the fungus Colletotrichum lagenarium, appears as numerous small tan to brown lesions on muskmelon and cucumber leaves or irregular black lesions on watermelon leaves. Defoliation can result from severe infection. Mature fruit lesions appear as large circular depressed and decayed spots. Fruit symptoms are usually the most conspicuous on mature fruit and not commonly seen on immature fruit. The causal fungus is seed-borne and can over-winter in infected plant debris. Seed grown in low rainfall areas of the West will generally be disease free. See BP-8-12, Anthracnose of Melons and Its Control, for further details.

Bacterial Wilt, caused by the bacterium Erwinia tracheiphila, commonly occurs on muskmelons and cucumbers in Indiana. Although able to infect other members of the cucurbit family, bacterial wilt is seldom found on squash and pumpkin. Watermelon is almost completely immune. The initial symptoms on muskmelons and cucumbers include a wilting of one or more leaves. Wilted leaves fail to recover and soon die. The bacteria move from wilted leaves into the petioles, killing individual runners. Eventually the bacteria may move into the plant crown, killing the entire plant. Melons that ripen on late-infected plants may be poorly netted and of inferior flavor. A cloudy, sticky sap can be squeezed from cut sections of infected runners. Placing two cut ends of infected stems together and slowly drawing apart may result in thin strings of viscous sap (bacterial slime).

The wilt-causing bacteria are carried in or on the bodies of the striped and spotted cucumber beetles and over-winter with the beetle. Feeding by bacteria-infested beetles on healthy vines or leaves is sufficient to transmit bacteria to the plant. Infection may take place at any time during the growing season, therefore, necessitating insecticides for beetle control throughout the growing season.

Downy Mildew, caused by the fungus Pseudoperonospora cubensis, commonly occurs on cucumbers and muskmelons in Indiana. Watermelons are only rarely affected. Symptoms first appear as pale green to light yellow areas on the upper leaf surface. Affected areas are limited by major leaf veins. During warm, humid weather, a purplish mildew growth appears on the underside of infected leaves. Infected muskmelon leaves rapidly dry up while cucumber leaves are less severely damaged. The fungus can cause infection over a wide range of temperatures (50 to 86°F) during rainy and humid weather.

Powdery Mildew, caused by the fungi Erysiphe cichoracearum and Sphaerotheca fuliginea, is recognized by a white powdery growth on the upper leaf surface. As the disease progresses, infected leaf areas turn brown and dry. Leaves and small stems are killed in severe infections. Fruit on severely infected plants becomes sunburned or may ripen prematurely. Infections resulting in a white powdery covering on fruits can occur on rare occasions.

Fungicides for Control of the Various Blights

Alternaria Leaf Spot, Downy Mildew: Use either maneb (80% WP) at 2 pounds per acre, zineb (75% WP) at 2 pounds per acre, zinc ion maneb (80% WP) at 2 pounds per acre, Bravo 75 WP at 1-1/2 to 2 pounds per acre, Bravo 500 at 2-1/4 to 4-1/4 pints per acre, Difolatan 4F at 4 pints per acre or Dyrene (50% WP) at 2 pounds per acre. Do not apply maneb, zineb, or zinc ion maneb within 5 days of harvest. Fixed copper fungicides may help to reduce disease losses during periods of adverse weather when alternated
with treatments using any of the above organic fungicides. To avoid phytotoxicity, use fixed copper fungicides at 1 to 1-1/2 pounds actual metallic copper per acre. Weekly treatments with fixed copper fungicides may cause a marginal burning of the foliage, particularly in hot, dry weather.

**Anthracnose:** Apply any of the above chemicals listed for Alternaria leaf spot and downy mildew control, or the systemic fungicide Benlate (50% WP) at 1/4 to 1/2 pound per acre.

**Angular Leaf Spot:** Spray with a fixed copper fungicide at 1 to 1-1/2 pounds actual
metallic copper per acre; (e.g., a fixed copper fungicide containing 50% metallic copper would be applied at 2 to 3 pounds of formulated chemical per acre.)

Powdery Mildew: Two chemical fungicides provide control of this disease. Karamthane (22% WP) at 1/2 pound per acre may be used on a 10-day schedule with last application no later than 7 days before harvest. Benlate (50% WP) has been shown to give excellent control at 1/4 to 1/2 pound per acre on a 7- to 14-day schedule.

Bacterial Wilt and Beetle Control: An insecticide must be used to control the cucumber beetles that spread bacterial wilt. Often the insecticide must be applied at least weekly to kill large numbers of beetles that may migrate from waste areas into cucumber and melon plantings in the period from seedling emergence until vining begins. For field control of beetles after vining starts, certain insecticides may be combined with fungicides for control of insects and blights. When bloom starts, caution should be used in application of pesticides that may be harmful to beneficial pollinators. For more information, see Department of Entomology publication E-30, Cucurbit Insect Control.

An Effective Spray Program

Fungicides are most effective when applied as a protective coating on the foliage rather than waiting until disease symptoms become evident. Therefore, a grower must be aware of the existing potential for disease in his field and apply fungicides accordingly. The best melon and cucumber disease control in Indiana has been obtained by commercial growers using 12 to 18 weekly or twice-weekly applications of fungicide. During extended periods of dry weather and the absence of heavy dews, fewer applications at longer intervals may be sufficient for good disease control.

Container labels have essential information concerning timing of applications, harvest restrictions, rates of applications, compatibility, etc. Before using fungicides, read labels thoroughly and understand them.

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