3-1-1962

Summer Rots of Apple

Purdue University Cooperative Extension Service

For current publications, please contact the Education Store: https://mdc.itap.purdue.edu/
This document is provided for historical reference purposes only and should not be considered to be a practical reference or to contain information reflective of current understanding. For additional information, please contact the Department of Agricultural Communication at Purdue University, College of Agriculture: http://www.ag.purdue.edu/agcomm
This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact epubs@purdue.edu for additional information.
SUMMER ROTS OF APPLE

In Indiana, apples are susceptible to several kinds of summer rots. These rots can show up any time between the late growing season and storage. And damage to infected apples can range from minor external blemishes to complete rotting.

Several summer rots of apples are economically important in Indiana, especially in Southern Indiana. But like most plant diseases, they can usually be controlled if proper measures are taken at the proper time.

COMMON SUMMER ROTS

Bot Rot

This disease is caused by the fungus Botryosphaeria ribes. In addition to a fruit rot, this fungus also causes a twig and limb canker.

Fruit rot lesions develop slowly on immature apples, and narrow, red rings surrounding the lesions can be seen on yellow varieties. Rot lesions on mature fruits spread quickly, forming a series of light-colored, oval spots regularly spaced around the middle or lower surface of the fruit. These spots enlarge to form a completely rotten, light-colored fruit. Syrupy beads form on the surface.

Twig and limb cankers vary from extensive deep lesions resulting in limb die back on Rome Beauty; small, circular lesions on Golden Delicious; hard, raised pimples on Cortland; to extensive shallow, non-girdling lesions on Ben Davis.

Bot rot may occur any time after petal fall. Wounds or cuticle breaks are necessary for infection. And anything that reduces tree vigor will encourage disease development. This includes moisture and nutritional deficiencies, winter damage and sunburning.

The fruit rot stage of this disease can be controlled with a combination of zineb and captan or zineb and Phaltan. Apply 1/2 to 1 pound each in 100 gallons of water in the cover sprays. In addition, prune cankered limbs, and keep the trees in good growing condition.

Black Rot

This disease is caused by the fungus Physalospora obtusa, which also causes a limb canker and leafspot. On apples, black rot usually begins at the calyx end. First only one brown spot appears later turning black. Eventually, the entire fruit rots. Often, a series of alternating brown and black rings occur. The rotted area is firm, leathery and slightly sunken. During rot development, black, pimple-like fruiting bodies (pycnidia) appear in the rotted area.

The fungus penetrates early in the fruits' development. However, the rot appears when the fruit approaches maturity. Wounds, frequently insect stings, are necessary for penetration.
The limb canker form of black rot looks like bot rot cankers. Fire blighted twigs frequently are where the fungus becomes established and spore are produced. The leafspot stage of the disease is known as frogeye leafspot. These spots vary in size. At first they are purple, but later the centers turn brown giving the frogeye appearance. Tiny, black pycnidia which house the spores are present in these lesions.

Fungicidal sprays recommended for black rot are the same as for bot rot. Applications should be started in the calyx stage and continue through cover application. Effective insect control should also be practiced to minimize fruit injury.

**Blotch**

This disease is caused by the fungus Phylosticta solitaria. The fungus requires heavy rainfall and moderate temperatures for infection, which may occur at any time after petal fall. Fruit lesions first appear as shiny, black blotches, varying in size. The spots are either sunken or slightly raised. The edges are irregular with radiating outgrowths or projections. As the blotches develop, the infected tissue becomes dry and hard and the underlying tissue stops growing. This causes cracks across the lesion.

The blotch fungus may also infect leaves and stems. The leaf disease occurs along the veins and midrib of the leaf and leaf petiole. The lesions are elongated, sunken, light tan or buff-colored. In severe cases, a tree may lose its leaves. The stem cankers occur around the leaf nodes or at the base of spurs and look like bot rot and black rot cankers.

Blotch may be controlled with a combination of zineb and captan. And cankers should be removed.

**Sooty Blotch and Flyspeck**

Sooty blotch is caused by the fungus Gloeodes pomigena. This fungus does not cause rotting but only superficial blemishes on the apples. Sooty blotch looks like a spot of soot on the fruit. Rubbing will remove the spot. Infection occurs any time during fruit development, but for the blotch to develop, cool, wet weather, especially in May and June and early fall, is essential.

Flyspeck is caused by the fungus Lep- tothyrium pomii and often occurs with sooty blotch. The tiny, black and often glistening spots resemble flyspecks on the fruit surface. These specks occur in groups. Generally, the conditions for infection and development are the same as for sooty blotch.

Sooty blotch and flyspeck are controlled by using zineb and glyodin at 1/2 to 1 pound each in 100 gallons of water in the cover sprays.

**Bitter Rot**

Bitter rot is caused by the fungus Glomerella cingulata. This disease first appears as a small light brown, circular area. The spot enlarges rapidly, becoming definitely circular and sunken in the center. The number of spots on a fruit may vary. As they enlarge, the spots turn brown to black, and cushion-shaped fruiting bodies of the fungus appear. Under humid conditions, large masses of salmon-colored spores are produced on the surface of the lesion. Beneath the surface, a cone-shaped rotten area extends to the core.

Infection occurs when the fruit approaches maturity. Hot, humid weather is most favorable for infection and rot development. Wounds or breaks in the cuticle are necessary for penetration.

Summer apples are more susceptible to bitter rot than fall and winter varieties. The same control methods for bot and black rots apply to this disease.

**Bitter Pit and Jonathan Spot**

These two conditions are not actually rots since they are not caused by parasitic
organisms, but are physiological disorders in the fruit. They enlarge little if any, after first forming.

Bitter pit is caused by too much water. The spots do not occur until the fruit is nearly ripe. They first appear as slightly sunken, water-soaked spots. On yellow or green varieties, they are dark green, while on red varieties they are a dull, deep red. Beneath the depression, the flesh is spongy, light to dark brown, and masses of dead tissue occur.

The best way to control bitter pit is to avoid overwatering (under irrigation), applying too much nitrogen fertilizer and excess pruning.

Jonathan spot is probably caused by a reduction in acid content of the color-bearing layers of the fruit. As the name implies, it occurs mostly on the Jonathan variety. The spots are usually associated with the lenticels (breathing pores) in the fruit skin. They are 1/16 to 1/8 inch in diameter, deep brown to black, slightly depressed and have a clear-cut border. Spots are more abundant around the stem end, and injury beneath the skin is very shallow.

Harvesting the fruit as soon as it reaches maturity and prompt cold storage should control the disease.

GENERAL CONTROL OF SUMMER ROTS

Prevention of summer rots of apples begins with proper orchard management. This involves correct pruning, watering and fertilizing. Healthy trees are better able to fight off infection from these summer rot fungi. But even by following recommended cultural practices, fungicides are needed for effective control.

In a well-managed orchard, free from dead limbs, and debris on the ground, 1/2 pound of zineb combined with 1/2 pound of captan in the cover sprays will very effectively control summer rots. In a poorly-managed orchard, 2 pounds of each fungicide will not effectively control these rots.

Spraying should begin at petal fall and continue as cover sprays every 5 to 14 days, depending on the weather and orchard condition, and should continue until one week before harvest. Remove all fire blighted twigs and limbs since they serve as entry points for fungus development. These sprays should also be combined with an effective insect control program.

HOW TO RECOGNIZE SUMMER ROTS

Bot Rot on Golden Delicious

Black Rot
Blotch on Maiden Blush

Bitter Pit on Starke

Sooty Blotch and Flyspeck on Grimes

Jonathan Spot on Jonathan

Bitter Rot