



Apple Scab

Apple scab is the most serious and economically destructive disease affecting apples in Connecticut and worldwide. Most of the commonly grown apples and crabapples are susceptible to scab. The disease causes losses by reducing the amount and quality of fruit and by reducing tree vigor. A reduction in tree vigor can result in increased winter injury and susceptibility to secondary diseases and insects.

Symptoms

Scab may occur on leaves, fruit, leaf and fruit stems, and green twigs. Infections of the leaves and fruit are most common. Early season scab infections (ascospores) first appear on blossom cluster leaves as olive green spots (lesions) up to 1/2" across with fuzzy margins. As the disease progresses the secondary (conidia) spots develop more distinct margins and become greenish black in color. Infected leaves are often misshapen and severe infection can result in defoliation. When the entire surface of the leaf is covered with scab that is referred to as sheet scab. Fruit is susceptible to infection by the scab fungus anytime during its development. Early infections can result in dropping of the blossoms and young fruit. Lesions on the young fruit resemble those on leaves and are generally located at the blossom end of the young fruit. As the fruit matures, the affected areas become brown, corky and often cracked. Late summer and fall fruit infection show up as small black specks called pin-point scab. Infections that occur just before harvest may be symptomless at picking yet develop into storage scab lesions after harvest.



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Disease Cycle

Apple scab is caused by the fungus *Venturia inaequalis*, which overwinters on disease-infected apple leaves on the ground and is also capable of infecting crabapple, hawthorn, mountain ash, and firethorn. In the fall the fungus begins to form tiny fruiting bodies (pseudothecia) which are embedded in the leaves near the surface. Sacs (asci) filled with the primary spores of the fungus (ascospores) start to develop within the pseudothecia by late winter or early spring. During rainy periods in the spring, just as apple buds are beginning to open, the fungus spores produced in the fallen leaves are forcibly discharged. Air currents can carry these microscopic spores to the newly emerging leaves, twigs, and later in the season, fruit, where germination takes place in the film of water on the leaves. Successful infection of the leaf depends upon the proper combination of moisture and temperature. The cooler the temperature, the longer the leaves must remain wet in order for infection to occur. It will take about 17 hours if the average temperature is 45°F but at 65°F infection takes about six hours.

One to several weeks after infection, depending upon temperature, spots appear on the leaves or fruit. Within these spots another type of spore is produced which is spread by rain and wind, resulting in secondary infections.

Secondary infections can occur several times during the growing season with suitable conditions, resulting in severe damage. Severely infected leaves turn yellow and drop prematurely, weakening the tree. Several years of early leaf loss can result in decreased growth, reduced bloom and increased susceptibility to winter injury.

Control Methods

Control of apple scab on apples and crabapples is possible through one or more of the following approaches:

Sanitation

The apple scab fungus overwinters on fallen leaves. Therefore, a reduction in disease severity may be accomplished on apples and crabapples by raking and destroying or composting fallen leaves. Ideally, this should be done in the fall or early spring before spore discharge occurs. This procedure is probably not worth the effort if your trees are in close proximity to a neighbor's apple trees.

Pruning

Pruning (both summer and dormant) will increase the efficacy of fungicides by opening up the tree canopy to increased light and air circulation.

Chemical Control

Fungicides are usually necessary if disease-free fruit is desired on susceptible varieties. Successful chemical control of scab requires application of the proper material at the right time. The generally recommended time is between when buds begin to break and a month after petal fall. Controlling scab early in the season when spores are being discharged from old leaves reduces the need for control in the summer months.

A number of fungicides are available at garden supply stores for use in scab control. All of the fungicides used for apple scab control are active as protectants and some are eradicant. Protectants prevent spores from germinating or penetrating the leaf. To be effective they must be on the leaf surface before the scab spore is deposited on the leaf. Most protectant type fungicides are effective in protecting foliage from infection for a period of about seven days if new leaf development is rapid. Thus, when infection periods are frequent, weekly sprays are needed from the green tip bud development stage through about the first week of June in Connecticut. Sprays can be discontinued if no scab infections are visible on fruit or leaves by about late June.

Eradicant fungicides have kick back action and can be applied after the infection period begins. Most eradicant fungicides have only a short period of kick back activity. To be effective as eradicant, they must be applied within 24 hours of the time an infection period rain begins.

A simpler control program requiring fewer spray applications will generally give satisfactory control on ornamental crabapples. An application before bloom followed by one or two additional treatments at 14 day intervals will usually provide a fair degree of control and prevent defoliation. More spray applications might be necessary during very wet seasons.

Resistant Varieties

Apples: Dayton, Enterprise, Florina, Freedom, Goldrush, Jonafree, Jon Grimes, Liberty, Macfree, Moiran, Nova Easygro, Novamac, Prima, Priscilla, Pristine, Redfree, Richelieu, Rouville, Sir Prize, Spigold, Trent and Williams Pride.

Crab-apple cultivars: *Malus* cv. 'Adams', *M. baccata* var. 'Mandshurica', *M. floribunda*, *M. cv.*

'Golden Hornet', *M. hupehensis*, *M. cv.* 'Mary Potter', *M. sargentii*, *M. cv.* 'Snowdrift', *M. cv.* 'White Angel', *M. cv.* 'Winter Gold', and *M. zumi calocarpa*.

Despite good cultural practices, pests and diseases at times may appear. Chemical control should be used only after all other methods have failed. For pesticide information please call UConn Home and Garden Education Center weekdays, in Connecticut call toll free 877-486-6271. Out of state call 860-486-6271

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