

# Apple Scab (*Venturia inaequalis*)



## Biology

Apple scab is caused by a fungus (*Venturia inaequalis*) which also causes scab on crabapple and hawthorn. It is common and destructive west of the Cascade range in Washington, Oregon, and coastal British Columbia. The apple scab fungus overwinters on dead apple leaves or fruit on the ground. During winter, black structures (pseudothecia) develop in the dead tissue. During the spring, in the presence of moisture and over a wide

range of temperatures, the pseudothecia produce sexual spores (ascospores), which are forcibly discharged and moved by air currents to infect developing foliage and fruit. Infections are visible 8 to 15 days later. They in turn produce asexual spores (conidia) in 15 to 18 days whenever weather conditions are favorable. Conidia cause new infections, continuing the disease cycle.

The first infections occur during wet weather in the spring. All outer parts of unopened fruit buds are highly susceptible to infection when exposed after cluster buds break. Bud or blossom infection often leads to shedding of blossoms or to severe infection of developing fruit. Preventing infection of flower stalks and sepals is important for successful control of scab. On the leaves the disease causes tiny, pale, chlorotic, water-soaked spots which enlarge and darken to a dark, velvety, olive-green then to black. Leaves may become distorted, puckered, and mottled. Leaves may drop, sometimes resulting in severe defoliation of susceptible trees. Scab can also affect fruit. Fruits infected early in development show olive-green to brown, roughened or corky spots which may develop deep cracks. These apples are often misshapen. Fruits infected at later stages develop small black "pinpoint" scab spots while in storage. It can take as little as 6 hours of wetness at 70°F for infection of fruit around bloom, but it takes almost 48 hours of wetness at the same temperature to infect mature fruit. The disease is favored by cool, wet conditions and overwinters in infected plant debris.

## Management Options

- Set irrigation timing so leaves do not stay wet for extended periods. Use sprinkler heads that do not wet the foliage of the tree or use drip irrigation.
- Plant in full sun.
- Space plantings and prune to provide good air circulation and light penetration; this reduces the amount of time foliage is wet from rain or dew..
- Plant scab-resistant varieties such as 'Pristine', 'Williams' Pride', 'Prima', 'Akane', 'Chehalis', 'Liberty', 'Enterprise', or 'Belmac'.
- Homeowners may reduce disease pressure by raking and disposing of leaves after they fall. If put in a compost pile, be sure leaves decompose completely.
- Apply nitrogen in the form of urea to leaves (on or off the tree) in fall to enhance decomposition of fallen leaves and make them more easily digestible to earthworms.
- Shred fallen leaves with a flail mower to help speed decomposition of infected leaves.

- Apply dolomitic lime in fall, after leaf drop, to increase soil pH and to help reduce inoculum next spring.

### **Chemical control**

The key to successfully controlling scab is to apply fungicides early and thoroughly to protect new growth. The first susceptible tissues exposed in opening cluster buds are the tips of the leaves and sepals. The most critical period for scab development is from the breaking of the cluster buds until leaves are fully expanded. Apply fungicides when leaves are separating, just exposing bud cluster. Repeat at 7-day intervals for 3 or more applications until weather dries. If the disease was a problem last year, begin applications at green-tip. Forecasting also can be used to time fungicide sprays. When in blossom, wait until 3/4 of petals have fallen before applying. Scab resistance to certain fungicides can occur if these materials are used exclusively or excessively. To minimize the development of resistant fungi, alternate the use of fungicides from different groups that have different modes of action. Also, limit applications from any particular group to three (3) or fewer per year. Homeowners should not make foliar applications to trees over 10 ft tall. Consult a commercial pesticide applicator for treatment of trees and shrubs over 10 ft. tall.

### **Forecasting**

Apple scab infection periods can be determined by measuring temperature and leaf wetness with weather monitoring equipment. Identify infection period so as to optimize fungicide treatments for better scab control.

Some examples of pesticide products are listed below. **Always read and follow all label directions.**

- Lime sulfur products such as Polysul, Lily Miller Dormant Spray for Disease and Bonide Lime Sulfur Spray are registered for home use.
- Spectracide Immunox at 0.67 fl oz/gal water. Do not use within 2 weeks of harvest. Do not apply more than 10 times per season.

See also Pacific Northwest Plant Disease Handbook (Oregon State University) online <http://pnwhandbooks.org/plantdisease/host-disease-descriptions/apple-malus-sp-scab>

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