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# APPLE AND PEAR SCAB

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*Integrated Pest Management for Home Gardeners and Landscape Professionals*

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Apple and pear scab are two different diseases that look very similar and are controlled in similar manners in home gardens and landscapes. Both cause spotting and scabbing of fruit, especially during wet springs but different fungi cause them.

The fungus *Venturia inaequalis* causes apple scab. Apple scab is a serious disease of apples in California, resulting in loss due to severe surface blemishing of fruit. It is most severe in coastal and foothill areas where spring and early summer weather is cool and moist. However, it can be a problem wherever apples grow when conditions are favorable for pathogen development. Apple scab also is a problem on ornamental crabapple.

Pear scab, which the fungus *V. pirina* causes, results in similar blemishes on pear fruit. The disease is most prevalent in the North Coast production area. However, *V. pirina* won't affect apples nor can the apple scab fungus cause problems on pears. Both have quite limited host ranges.

## IDENTIFICATION

Scab first appears as yellow, or chlorotic, spots on leaves. As the disease progresses, dark, olive-colored spots form on leaves, fruit, and—in severe cases—stems (Figs. 1 and 2). Spots on the undersurface of leaves sometimes look velvety due to fungal growth (Fig. 3). Affected leaves might twist or pucker; in minor cases, this will affect only a few, irregularly scattered leaves, but if the disease is severe, all foliage could show symptoms. Severely affected leaves often turn yellow and drop.

When scab affects flower stems (Fig. 4), it can cause flowers to drop. Scabby spots can appear on fruit later in the



Figure 1. Leaf infected with apple scab.



Figure 2. Pear scab appears as velvety, dark olive to black spots on leaves and leaf stems.



Figure 3. Apple scab lesions on the under-surface of a leaf.

season (Figs. 5 and 6). These begin as velvety or sooty, gray-black (and sometimes greasy looking) lesions that sometimes have a red halo. The lesions later become sunken and tan and can have areas of olive-colored spores around their margins. Severely infected fruit becomes distorted and usually drops from the tree. Fruit also can crack, which allows entry of secondary organisms.



Figure 4. Apple scab infecting flower stems.



Figure 5. Fruit scabs caused by apple scab infection.



Figure 6. Fruit damaged by pear scab.

## LIFE CYCLE

Both apple and pear scab pathogens overwinter primarily in infected leaves on the ground. Rainfall or sprinkler irrigation is necessary to release the spores. In spring, air currents or splashing water carry these primary spores (ascospores) from the infected leaves to flowers, leaves, or fruit where they germinate and cause primary in-

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# PEST NOTES

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fections. Pear scab also can overwinter in lesions on pear twigs in high rainfall areas (Fig. 7).

Secondary spores, or conidia, are produced on infected leaf or fruit surfaces 8 to 17 days following primary infection. In the case of pears, this process also occurs on twig lesions. The disease continues to spread until conditions become dry or the plant tissue becomes more resistant to infection.

Infection occurs most rapidly between 55° and 75°F, and leaves or fruit must remain wet continuously for a minimum of 9 hours for initial infection to occur at these temperatures. If spring weather is dry from the green tip stage of bloom (when flowers are still green and petals aren't showing yet) through fruit set, scab usually won't be a problem. Figure 8 shows the disease cycle of apple scab.

## DAMAGE

Scab can destroy an apple or pear crop. Young, infected flowers or fruit can drop, or the fruit can become malformed, cracked, and unsightly, rendering them unusable. Defoliation follows

severe, early leaf infection. Late-season infections generally can be tolerated in backyard trees, because peeling the fruit will remove the pinpoint-sized scab lesions.

## MANAGEMENT

Several techniques are available for controlling scab. Advantages of one method over another depend on the number of trees you are managing and whether conditions are ideal for disease development.

### Cultural Control

For a single, backyard tree, removing—then composting or destroying—its dropped leaves in autumn or winter can limit the disease to tolerable levels. In plantings of several trees, additional steps might be necessary to effectively control this disease, especially in cool, moist coastal areas. These include applying zinc and fertilizer-grade urea (or some other nitrogen source) to leaves in autumn to hasten leaf fall and adding lime to leaf piles beneath the tree. In pears, apply urea by itself, because zinc can be phytotoxic.

If you are using sprinklers that wet any of the tree's foliage, irrigate between sunrise and noon to allow adequate drying time, or reduce the angle of the sprinkler.

### Disease-resistant Cultivars

Table 1 lists the relative susceptibility of different apple varieties to apple scab. Major breeding efforts for disease resistance are ongoing in New York, where Enterprise, Liberty, Prima, Priscilla, and many newer varieties appear to be resistant to scab. Scab-resistant crabapples also are available.



Figure 7. Pear scab appears as velvety, dark olive to black spots on twigs.

Table 1.

Susceptibility of Apple Varieties to Apple Scab.

Susceptible	Highly resistant
Bellflower	Easy-Gro
Blushing Gold	Enterprise
Fuji	Florina
Gala	Freedom
Golden Delicious	Goldrush
Granny Smith	Jon Grimes
Gravenstein	Jonafree
Grimes	Liberty
Ida Red	Mac-free
Jonathan	Prima
Monroe	Priscilla
Mutsu	Pristine
Paula Red	Redfree
Red Delicious	Sir Prize
Rome Beauty	Spigold
Stayman Winesap	Williams Pride
Winesap	
Yellow Newtown	
York Imperial	

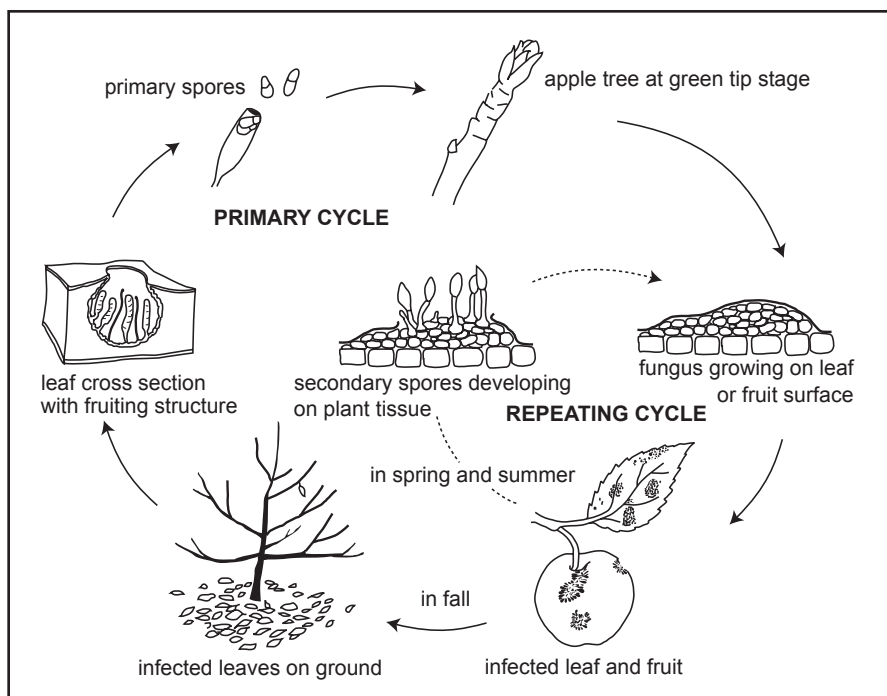


Figure 8. Disease cycle of apple scab.

European pear cultivars with negligible scab risk include Arganche, Barnett Perry, Batjarka, Brandy, Erabasma, Harrow Delight, Muscat, Orcas, and Passe Crassane. Because Asian pears (*Pyrus pyrifolia*) are a different species, they are less susceptible to scab than European pears (*P. communis*).

### Chemical Control

Fungicide sprays are necessary only if the weather is rainy and leaves are likely to remain wet for 9 or more hours. Fungicide applications require careful attention to timing, as preventing early infection is the most important step toward successfully controlling later fruit infections. It is difficult to prevent secondary fruit infections once primary infections occur.

Unlike peach leaf curl, treatments for scab made when trees are completely dormant aren't effective and aren't recommended. If treatments are needed, the generally recommended time is between when buds begin to break and a month after petal fall.

If rain threatens, it is important to apply a fungicide as soon as you see the tips of the leaves emerge. A second application might be needed 10 to 14 days later if it is still rainy, once you can see blossom clusters but before they have opened. If rainy weather continues, apply a third spray toward the end of the bloom period, when most of the petals have fallen.

The surfaces of the fruit and foliage become more resistant to infection as the season progresses, although extended wet, foggy weather can lead to an infection period due to secondary spores that develop on leaves and fruit. If no scab infections are evident 1 month after petal fall, secondary infections probably won't be a problem, and fungicide sprays can stop. However,

continue to watch for pinpoint scab symptoms, especially if late rains occur.

Several fungicides are available for controlling apple and pear scab. These include fixed copper, Bordeaux mixtures, copper soaps (copper octanoate), sulfur, mineral or neem oils, and myclobutanil. All these products except myclobutanil are considered organically acceptable.

Generally copper or Bordeaux sprays should be used only from green tip to full bloom. Later applications increase the risk of fruit russetting, a chemical burning of the fruit skin, although in some years this occurs even if you've used these materials only before full bloom. Fixed copper products include Lilly Miller Kop-R-Spray concentrate and Monterey Liqui-Cop. Bordeaux mixture is a combination of copper sulfate and hydrated lime that must be mixed just before application. For more information about how to prepare this fungicide, see *Pest Notes: Bordeaux Mixture* listed in References.

You can apply wettable sulfur through bloom and early fruit set. When using sulfur-containing compounds such as wettable sulfur, never apply them within 3 weeks of an oil application or when temperatures are near or higher than 90°F. Bordeaux has a narrower application time frame than other sulfur-containing products, because it contains copper, and shouldn't be applied after full bloom.

Myclobutanil (Spectracide Immunox Multipurpose Fungicide Spray Concentrate) is a synthetic fungicide that is effective against apple scab. You can apply it any time from green tip until after petal fall.

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Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original, labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Pesticides applied in your home and landscape can move and contaminate creeks, rivers, and oceans. Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash or pour pesticides down the sink or toilet. Either use the pesticide according to the label, or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Household Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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