

report on PLANT DISEASE

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DEPARTMENT OF CROP SCIENCES UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

SCAB OF PEACH, NECTARINE, PLUM, AND APRICOT

Scab, also known as black spot or freckles, is caused by the fungus *Cladosporium carpophilum*. The disease occurs throughout the Midwest, wherever peaches, nectarines, plums, and apricots are grown. Nectarines, plums, and apricots are less affected than peaches. The principal loss from scab is the spotting of the fruit skin. Minor losses occur from premature defoliation and a dieback of the twigs. Warm, wet conditions during the spring and early summer after petal-fall are necessary for a severe infection by the scab fungus.



Scab is most common in home orchards where no *halo on mature peach fruit (courtesy D.F. Ritchie).* specific fungicide control program is practiced. The

general use of fungicides by commercial growers has reduced the loss from scab; it is a minor disease, except in very wet seasons on poorly pruned trees with poor orchard sanitation. The disease is usually more serious in low-lying, moist, shady areas where evaporation from fruit surfaces is poor.

SYMPTOMS

Fruit. Scab first appears on the fruit about 6 or 7 weeks after the petals have fallen, when the fruit are half-formed to nearly full grown. Small, round, olive green spots about 1/16 to 1/8 inch in diameter develop on the surface of the fruit (Figure 1). Scab is most common near the stem end or on the side of the fruit exposed to the sun. The superficial spots slowly enlarge and may merge to form large, irregular blotches that turn a velvety dark olive green or black. On apricot, the lesions are more brown than black. A thick, corky layer of cells develops below the scabbed area. Severely infected fruit are stunted, become misshapen, may crack open sometimes to the pit (Figure 2), become dry and shrivel, and never ripen. Cracked fruit are frequently invaded by brown rot and *Rhizopus* rot fungi. Scabby fruit often drop prematurely. Those fruit that are picked do not ship or store well.

Twigs. Scab-affected twigs develop yellowish brown, oval to round, slightly raised blotches about 1/8 to 1/4 inch in diameter, with a dark gray or bluish border (Figure 3). Lesions appear on the tender green twigs at about the time spots appear on the fruit. Where severe, the spots may enlarge and merge to form large, irregularly-shaped, dark brown areas. Infrequently the cambium is killed, causing the twigs to die back.

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Leaves. Lesions sometimes appear on the underleaf surface as small (usually up to 1/4 inch in diameter), round, pale green spots. The lesions later turn yellowish green to yellowish brown, finally becoming brownish black. Long, narrow, dark brown lesions develop along the midrib. Diseased leaf tissue may dry and drop out, leaving "shot-holes." Scab-affected leaves usually drop prematurely if the season is wet.

DISEASE CYCLE

The scab fungus overwinters in lesions on the twigs infected the previous year. During the spring and summer, large numbers of microscopic spores (conidia) are formed on the surface of the twig lesions. They remain firmly attached until moistened. At 100 percent relative humidity, 20 to 30 hours are required for abundant sporulation on the twigs. The spores are produced in great numbers during warm, wet weather from the shuck split stage to 6 weeks later on peaches and are spread to developing fruit, twigs, and leaves by splashing rains and windblown mist. Peach fruit are most susceptible about the time the shuck falls from the developing fruit, whereas nectarines and apricots are

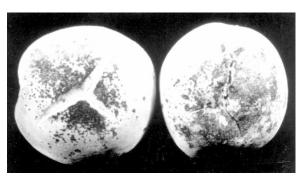


Figure 2. Severely scabbed peach fruit showing cracking.

susceptible 1 to 2 weeks after petal-fall. Spore germination and fungus growth are most rapid at 65° to 75°F (18° to 24°C) but can occur between 37° and 95°F (2° and 35°C).

Germ tubes from the conidia penetrate the cuticle and result in hyphal strands or a mat being formed between the cuticle and outer wall of the epidermal cells. Erect, spore-bearing stalks (conidiophores) later push up through the cuticle to form a velvety, almost black, fruiting layer that bears tremendous numbers of ovate, generally one-celled conidia (Figure 4). If weather conditions are favorable, penetration and infection begin to occur at about shuck fall. The fruit remain susceptible until harvested.



Figure 3. Scab lesions on peach twigs

The time interval between fruit infection and the first appearance of symptoms is 40 to 70 days. Thus, the disease is usually not observed until the fruit are well grown. The incubation period for leaf and twig infection is 25 to 45 days.

Since twig lesions continue to produce conidia from shortly after petal-fall until late fall, infection may occur throughout most of the growing season and may result in more or less continuous production of twig lesions. Although the leaf spots produce a few conidia late in the season, they are of little importance in the disease cycle. Conidia produced in fruit lesions reinfect the twigs and leaves. Conidia produced on the fruit may reinfect the fruit but the lesions resulting from these infections usually are not seen except on late-ripening cultivars, and possibly, in storage.

- CONTROL
- 1. Where possible, when planning an orchard, avoid low-lying sites with poor air and soil drainage. Destroy nearby wild or neglected peaches, nectarines, plums, and apricots.

- 2. Prune trees annually to allow for good air circulation. The open-center system is suggested for peaches, nectarines, Japanesetype and hybrid plums; the modified-leader or open-center system is suggested for apricots. Generally, scab is most severe the first year the trees bear fruit (usually the third growing season). This results from the large numbers of twig lesions that develop during the first two growing seasons if no fungicides were applied during this time; thus the fungus has an excellent chance to increase to high levels and remain relatively unnoticed.
- 3. Scab is controlled primarily with fungicide sprays. The important sprays are those during the period from petal-fall until 40 days before harvest. Fungicide protection is especially critical from shuck split to 5 weeks post bloom. Sprays should be applied every 10 to 14 days until about a month before harvest. During the month before harvest sprays follow the suggested peach spray program L. Gray).

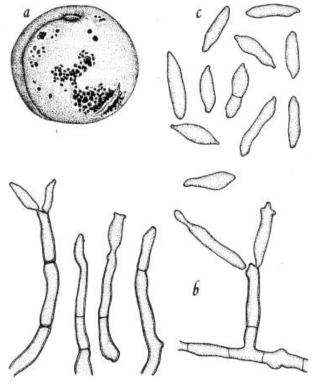


Figure 4. <u>Cladosporium carpophilum</u>, the scab fungus, as it would be seen under a high-power laboratory microscope applied for brown rot control will help reduce (b and c): (a) scab lesions on the surface of a peach fruit; late-season scab infections on the fruit, twigs, (b) erect, simple and septate conidiophores, some bearing and leaves. Commercial orchardists should conidia; (c) ovate, generally one-celled conidia (drawing by

outlined in Illinois Commercial Tree Fruit Spray Guide, revised annually. Home Fruit Growers should follow the spray schedule for peaches, nectarines, apricots, and plums outlined in the Midwest Tree Fruit Pest Management Handbook.

4. Most cultivars of peaches, nectarines, plums, and apricots are about equally susceptible to scab.