

LEAF CURL

Integrated Pest Management in the Home Garden

Leaf curl, also frequently referred to as peach leaf curl, is a disease caused by the fungus *Taphrina deformans*. Peach leaf curl affects the blossoms, fruit, leaves, and shoots of peaches, ornamental flowering peaches, and nectarines, and is one of the most common disease problems for backyard gardeners. The distorted, reddened foliage that it causes is easily seen in spring. When severe, the disease can reduce fruit production substantially.

IDENTIFICATION AND DAMAGE

Leaf curl first appears in spring as reddish areas on developing leaves. These areas become thickened and puckered, causing leaves to curl and severely distort (Fig. 1). The thickened areas turn yellowish gray and velvety as

spores are produced on the surface by the leaf curl fungus. Affected leaves later turn yellow or brown and can remain on the tree or may fall off; they are replaced by a second set of leaves that develop more normally unless wet weather continues. The loss of leaves and the production of a second set result in decreased tree growth and fruit production. In addition, defoliation in spring may expose branches to sunburn injury.

The leaf curl pathogen also infects twigs and shoots. Affected shoots become thickened, stunted, distorted, and often die. Only rarely do reddish, wrinkled areas develop on fruit surfaces; later in the season these infected areas become corky and tend to crack. If leaf curl infection builds up and is

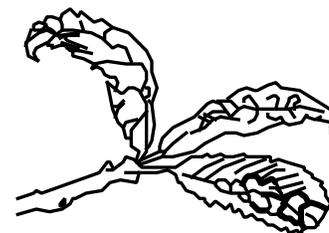


Figure 1. Leaf curl symptoms.

left uncontrolled for several years, the tree may decline and need to be removed.

LIFE CYCLE

It takes about 2 weeks after leaves emerge from buds before leaf symptoms appear (Fig. 2). The fungus grows between leaf cells and stimulates them to divide and grow larger than normal, causing swelling and distortion of the leaf. Red plant pigments accumulate in the distorted cells. Cells of the fungus break through the surface of distorted leaves and produce elongated, saclike structures called asci. Inside the asci are spores known as ascospores, which give the leaf a powdery or feltlike appearance. The ascospores are released into the air, carried to new tissues, and bud (i.e., divide) to form bud-conidia. The fungus survives the hot, dry summer as bud-conidia and ascospores on the tree's surfaces. When the weather turns cool and wet in fall, the ascospores germinate to produce bud-conidia. The new bud-conidia and the overwintering bud-conidia continue

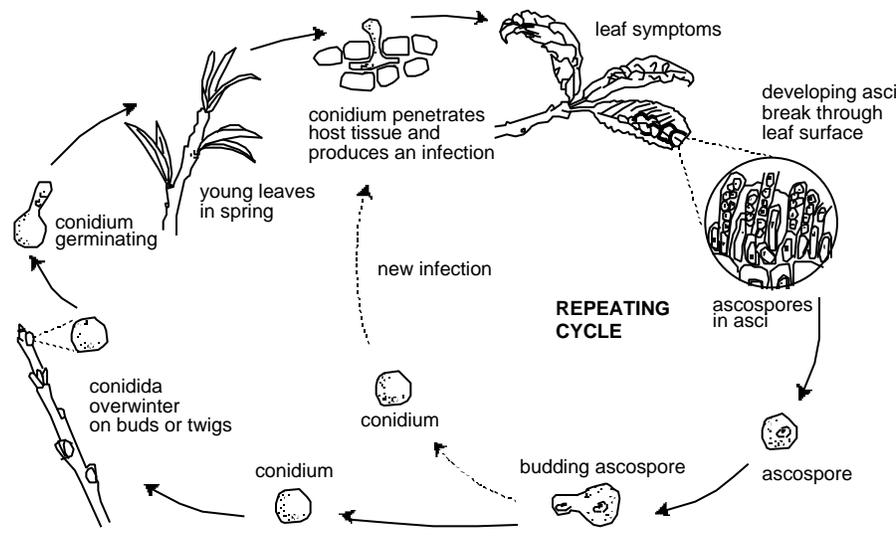


Figure 2. Leaf curl disease cycle.

to increase in number by budding. Eventually a film of bud-conidia is formed on the tree's surface. In spring, the bud-conidia are moved by splashing water and can infect newly developed leaves.

Cool weather prolongs the period of disease development by slowing leaf growth. Development of leaf curl ceases when young tissue is no longer developing or when weather turns dry and warm (80° to 85°F).

MANAGEMENT

To prevent peach leaf curl, treat peach and nectarine trees every year after leaves have fallen (late November). Copper-based fungicides including Bordeaux mixture (a slurry made of hydrated lime and copper sulfate; for information on preparing this mixture see *Pest Notes: Bordeaux Mixture* in "References"), tribasic copper sulfate, calcium polysulfides, metallic copper, or synthetic fungicides can be used. However, to be effective, copper-containing compounds must have at least 50% copper; those containing less do not adequately control leaf curl despite

advertising claims. If timed properly, a single fall/winter spray will normally prevent losses.

In areas of high spring rainfall or when spring rainfall is abundant, it may be advisable to apply a second copper spray or a lime sulfur treatment in spring, preferably before buds begin to swell, but definitely before budbreak (when green color is first visible). Fungicides containing chlorothalonil also work well at this time.

Although symptoms of leaf curl are seen primarily in spring as new leaves develop, there is little you can do to control the disease at this time. Some people remove diseased leaves or prune infected shoots, but this has not been shown to improve control. (Pruning in fall, however, can reduce the spore inoculum overwintering on the tree.) Normally, diseased leaves fall off within a few weeks and are replaced by new healthy leaves, unless it is rainy. *If leaf curl symptoms occurred on your trees in spring, be sure to treat the following fall, around late November, to prevent more serious losses the next year.*

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REFERENCES

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For more information contact the University of California Cooperative Extension or agricultural commissioner's office in your county. See your phone book for addresses and phone numbers.

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To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned.

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WARNING ON THE USE OF CHEMICALS

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.

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 nor pour pesticides down 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 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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