

Leaf Curl Disease in Apricots (*Taphrina deformans*)

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Description of the problem:

The apricots came out from dormancy and they were beautiful; however, they started defoliating and now there are almost no leaves left. Symptoms were first observed during the last season, but the disease was not identified.

PICTURES ATTACHED:



Diagnostic: By observing the symptoms in the leaves the disease is identified as Leaf Curl caused by the fungus *Taphrina deformans*.

The disease

Leaf curl is a common affliction for peaches and nectarines, often observed in unsprayed orchards and home yards during cold, wet springs. It distorts the blossoms, leaves, fruit, and shoots of the plant. In years conducive to disease, significant defoliation and yield loss can occur.

Symptoms and signs

Symptoms typically appear two weeks after leaf emergence, starting as reddish spots that progress to puckered areas. Entire shoot tips may become distorted, with leaves turning yellow or reddish-brown. Ultimately, affected leaves wither and fall, potentially causing sunburn injury on branches. Although new leaves emerge from dormant buds, their growth is hindered, reducing yield and weakening the tree. Repeated defoliation over several seasons may lead to tree death.

Disease cycle

Leaf curl disease, caused by the fungus *Taphrina deformans*, impacts peaches, nectarines, and apricots. Spores of this fungus persist on bud scales and twigs throughout the summer, fall, and winter seasons. With the advent of moist conditions in early spring, these spores develop into conidia, which are then transported into buds via splashing water. As buds swell and open, developing leaves become vulnerable to infection. Cool and wet weather conditions prolong leaf development, increasing the likelihood of infection, with optimal infection occurring at temperatures between 50°F and 70°F. However,

as leaves mature, they become less susceptible to infection. Secondary infections are rare and of little consequence. Dry weather during bud swelling and opening may limit the occurrence of leaf curl, although the fungus can persist to infect trees in subsequent seasons.

At advantaged stages, the fungus not only targets leaves but also affects tender growing shoots and,

less frequently, blossoms and fruits. Infected twigs exhibit slight swelling, may appear yellowish, and remain stunted. Infected blossoms and fruit typically drop prematurely from the tree, although some infected fruit may persist. Diseased fruit displays shiny, raised, warty, and discolored areas.

Management Strategies

Cultural methods:

1. There is a distinct varietal susceptibility to the disease. But it is important to also note that some cultivars show resistance to leaf curl, but apparent resistance observed in the field can be due to different times of bud movement, which might avoid favorable conditions in one season, only to become infected in another season after different weather conditions.
2. It is also important to consider the situation of the plantations, with lower and less ventilated areas of the plots being more affected, where fog may persist.
3. As preventive measures, during pruning, it is necessary to remove and destroy the affected shoots from the previous year.
4. It is also important to remove affected shoots and deformed fruits at the time of fruit thinning.
5. In winters where preventive applications cannot be made and the disease is established, spring treatments are not useful. It's not possible to control the fungus once it's entered the leaf. Poor disease control is usually a result of spraying too late – that is, after budswell. In a planting containing peach and nectarine cultivars, sprays must be timed for that cultivar that shows the earliest movement of buds.
6. When leaf curl is severe, maintenance of tree vigor is very important. Fruit should be thinned to compensate for the loss of leaves. Over-cropping a tree will weaken it and make it more susceptible to winter injury. Trees should be adequately irrigated, and additional nitrogen fertilizer may be helpful for trees that are defoliated.

Management Strategies

Organically Acceptable Methods:

Applying Bordeaux mixture or copper spray is permissible within the standards of an organically certified crop.

Chemical Control (from UC IMP website, please read the full chemical recommendations at <https://ipm.ucanr.edu/agriculture/peach/peach-leaf-curl/#gsc.tab=0>):

Most copper products have long residual activity, even during prolonged wetness. Therefore, one application in the dormant/delayed dormant period is sufficient except in areas of high rainfall or where leaf curl has become an increasing problem. In such cases, an added application at delayed dormancy in late winter or before bud swell is recommended. Recently, formulations of fixed coppers have been developed with reduced metallic copper equivalent (MCE). Residual activity is very important to control peach leaf curl and these products, when lower rates are used (e.g., 1.2 to 2.1 lbs/A MCE for reduced MCE fixed coppers, compared to 3 to 5 lbs/A MCE for fixed coppers or even 8 to 10 lbs/A MCE for basic copper sulfate), have not been as efficacious over long rainy winter seasons.

If using the newer reduced MCE products

- always use the upper label rate,
- consider using a sticker or winter oil as an adjuvant to increase persistence, and
- plan to make two applications.

Several other fungicides that are equivalent or even more effective than copper for managing peach leaf curl are ziram, chlorothalonil (Echo or Bravo), and dodine (Syllit) when applied at the optimal time. Ziram is the most effective.

- Apply in late November/early December after most leaves have fallen from trees to ensure excellent coverage of branches, stems, and buds and before significant late fall and winter rainfall occurs. (This spray will also control shot hole (*Wilsonomyces carpophilus*).
- Apply an additional January/early February treatment if high rainfall occurs in December and early January.
- In addition to January/early February treatments, apply a pre-bloom (at bud swell or two weeks before bloom) if high rainfall occurs in February.

To increase fungicide persistence of the materials, use an adjuvant such as an oil or a sticker.