



Peach Leaf Curl Disease

Claudia Nischwitz, Extension Plant Pathologist • Brent Black, Extension Fruit Crop Specialist • Mike Pace, Box Elder County Extension Agent

What you should know

- The disease is caused by the fungus *Taphrina deformans*
- Disease is most severe during cool wet conditions
- Foliage is susceptible until it is fully expanded
- Infected leaves are distorted and discolored (yellow, red or sometimes purple)
- Single fungicide treatment in the fall can prevent the disease

INTRODUCTION

Peach leaf curl disease is caused by the fungus *Taphrina deformans*. The fungus is specific to peaches and nectarines and can infect expanding leaves and immature fruit. The fungus is found anywhere peaches are grown but usually goes unnoticed during years in which it is dry and warm during bud swell and leaf expansion. The disease occurs when the weather is wet and cool at the time of leaf emergence and expansion. As long as growers keep up with proper management of the disease every year, it is usually not a problem. However, in the arid Intermountain West where spring conditions are often warm and dry, growers frequently relax their management of the disease.

SYMPTOMS

T. deformans induces cells of infected leaves to multiply rapidly and randomly and enlarge, resulting in deformation and curling. The infected distorted leaf parts are often yellow or red colored. Infected leaves eventually turn brown and fall off. Young infected fruit may also drop prematurely or fruit will show wart-like symptoms when mature. The tree will leaf out again to replace the fallen leaves which can result in significant yield reduction.



Fig. 1. Red discolored leaves infected with *Taphrina deformans*, causal agent of peach leaf curl disease



Fig. 2. Close-up of leaves infected with *Taphrina deformans*

DISEASE CYCLE

Infections occur when temperatures are between 50F and 70F. Disease incidence is highest and most noticeable during wet conditions (Steiner and Biggs, 2010). During cool temperatures, expansion of young leaves is slower, allowing for a longer infection period. At higher temperatures, infection may occur but symptoms will not develop due to faster expansion of the leaves. Once leaves have fully expanded, they become resistant to the pathogen.

T. deformans does not produce fruiting bodies. It forms a single layer of asci (sac-like structure that contain sexual spores) that break through the cuticle to the surface of the discolored and distorted leaf areas (Broome and Ingels, 2011). It is sometimes visible as a dusty cover on the leaves. The spores are released and are blown to the bark of trees where they survive during the summer. The sexual spores eventually germinate and produce blastospores. The blastospores multiply by budding ("sprouting" a new spore directly from the older spore) and are washed onto new emerging leaves in the spring.

Symptoms usually appear two weeks after infection occurred. The fungus survives with blastospores on the bark of peach trees and near buds. During wet weather the spores are washed onto emerging leaves. The spores germinate and penetrate the leaves. The fungus grows between the cells and induces the distorted blister-like deformation of leaf and young fruit tissue by releasing hormones such as cytokinins and auxins that lead to increased plant cell division and enlargement of plant cells. The increased amount of cytokinins results in the plant's increased transport of nutrients to the infected tissue providing more food for the fungus.

MANAGEMENT

There are no management options after infection has occurred. Control can be achieved by a single application of fungicides in the fall after 90% of leaves have fallen to the ground (Steiner and Biggs, 2010). Thorough coverage of the trees is easier to achieve when most leaves are on the ground and excellent coverage is needed for good control. Chemicals that can be used for control are copper products or chlorothalonil (Bravo®, Syngenta). Fall fungicide applications should be used in orchards with a history of leaf curl to reduce inoculum.

Cultural practices that can be used by homeowners are removal of infected leaves that have fallen to the ground to remove as much inoculum as possible. Resistant varieties are another option for cultural control. According to a Pest Note from the University of California varieties including Muir and Q-1-8 are resistant to *Taphrina deformans*. The variety Redhaven and varieties related to it are tolerant to the disease and the variety Frost is very tolerant but requires fungicide applications in the first three years after planting. Sus-



Fig. 3. Fruit infected with *Taphrina deformans*¹

ceptible to highly susceptible varieties include Redskin and its derivatives (Broome and Ingels, 2011).

REFERENCES

Broome, J.C. and Ingels, A.C (2011) Peach Leaf Curl – Pest Notes, University of California.

<http://www.ipm.ucdavis.edu/PDF/PESTNOTES/pnleaf-curl.pdf>

Steiner, P.W. and Biggs, A.R. (2010) Peach leaf curl, West Virginia University

http://www.caf.wvu.edu/kearneysville/disease_descriptions/omplfcr.html

Image credits

¹R. Wallace, University of Georgia, bugwood.org

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