Verticillium Wilt

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2005 has been a particularly bad year for Verticillium wilt, especially on the west side in old row crop ground. Many second and third-leaf orchards have extensive limb death. Affected trees will have to be retrained or replaced. Even first-leaf trees are affected this year, which is pretty unusual. All *Prunus* species trees (almond, apricot, cherry, plum, peach, etc.) are susceptible.

The soil-borne fungus invades trees through the root and grows up into the water-conducting pipes (xylem) in the trunk and limbs. The fungus eventually clogs the pipes and then shoots die from lack of water. Affected limbs collapse quickly and shoot tips often turn dark and curl into a characteristic "shepherds hook". If you cut cross ways through an affected limb, you can often see a darkened ring. This is the area of clogged xylem vessels. Extended, cool spring weather like we had this year favors growth of the fungus which leads to more extensive problems. Once temperatures heat up in the summer, the fungus dies out in the upper part of the tree and no more shoots die. Although shoot dieback is rarely observed in almond and stonefruit trees older than five years, it is very likely that tree growth and yield will be affected even in the absence of disease symptoms. Pistachios on susceptible rootstock can have serious shoot dieback problems for the entire lifespan of the orchard.

This fungal pathogen is generally present at very low levels in most San Joaquin Valley soils. High populations of Verticillium develop in soils where susceptible crops are grown, such as tomatoes, cotton, cucurbits (melons) and strawberries. Vert can also build on weeds such as pigweed, groundsel, London rocket, nightshade and dandelion. Verticillium forms resistant spores called microsclerotia that can survive for 6-12 years in the soil.

There is no "cure" for an infected tree. If you plan to plant an orchard in ground previously planted to susceptible row crops, you should take soil samples to determine your risk of Verticillium wilt. Only sample the top twelve inches of soil because the microsclerotia are pretty shallow. Significant Verticillium wilt disease can occur in almond orchards when there are only three microsclerotia present per gram of soil. Only <u>one</u> microsclerotia per gram is necessary for significant problems in pistachio. Following a susceptible annual crop, there may be <u>60 or more microsclerotia per gram</u> in the top foot of soil.

Solarization with clear plastic is very effective in killing Verticillium. Fumigating with chloropicrin or combinations of methyl bromide or Telone® that contain chloropicrin can be effective in reducing Verticillium. All peach and peach/almond hybrid rootstocks are very susceptible. Marianna 2624 plum rootstock is somewhat resistant, but probably not worth the trouble.