



## ARMILLARIA ROOT ROT OF STONE FRUITS

Armillaria root rot affect all species of stone fruit crops. The fungus *Armillaria mellea* has been reported the main pathogen of Armillaria root rot of stone fruits. In addition, *A. ostoyae* and *A. bulbosa* have been found causal agents of Armillaria root rot. These fungi are common soil inhabitants in woodlands throughout the eastern United States.

### Symptoms

Affected trees have reduced terminal shoot growth and exhibit reddish to purplish foliage much earlier in the autumn than healthy trees. Diseased trees may collapse in midsummer, and the leaves fail to abscise and remain attached into early winter (Figure 1). Trees usually die in a circular pattern from foci consisting initially of one or two infected trees. Armillaria root rot is more common on light, well-drained, sandy soils, whereas Phytophthora root rot is common in heavy, poorly drained, clay soils.



**Figure 1.** Sudden collapse of sour cherry tree in midsummer caused by *Armillaria* root rot. Leaves remain attached into winter. (Courtesy A. L. Jones and T. B. Sutton).

Proper diagnosis requires removal of soil from around the bases of declining trees. A fan-shaped, white fungal mat often is present between the bark and the wood on the crown of affected trees (Figure 2). Dark brown to black threadlike rhizomorphs may be observed on the surface of the bark (Figure 2). Rhizomorphs are about the size of shoestring and also are found on dead roots, on the surface of live roots in advance of the necrotic tissues, and in the soil around the roots of infected trees. Clusters of mushrooms may arise at the base of dead trees in late August or September (Figure 3). These mushrooms are honey-colored with a ring or annulus on the stem or stipe just beneath the gills.

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## Life cycle

*Armillaria* spp. may exist in an orchard site before planting, because mycelium of fungi may persist for many years on infected roots of removed forest trees or other tree species. In addition, rhizomorphs may survive in the soil or on dead, infested roots. *Armillaria* spreads within orchards by growth of rhizomorphs, fungal extrusions, and mycelial strands along roots, or possibly through the soil, to contact points with roots of adjacent trees. Spread to new orchard sites is by movement of infested soil or infected roots.



**Figure 2.** White mycelia at cambial area (left) and shallow cut with rhizomorphs on surface (right) of an *Armillaria* sp. on the trunk of sour cherry tree. (Courtesy American Phytopathological Society).

## Disease management

Although no common species of stone fruit crops is immune to *Armillaria*, rootstocks vary in susceptibility. Some rootstocks resistant to *Armillaria* in one test may be susceptible in another test because of differences in the species of *Armillaria* involved.

Cultural practices are the main management methods of *Armillaria* root rot of stone fruits. Newly cleared woodland or orchard sites

with a history of *Armillaria* root rot should not be planted to stone fruit crops. If replanting of infested tree sites is attempted, the soil should be clean cultivated and as much root debris as possible removed. Soil fumigation has not been very effective in controlling the disease because rhizomorphs and infected root debris deep in the soil are not easily reached and permeated by chemical vapors. Deep plowing or chiseling should not be attempted in affected areas.



**Figure 3.** Mushrooms of *Armillaria ostoyae* around the base of a cherry trunk. (Courtesy A. L. Jones and T. B. Sutton).