

70% ethyl alcohol, particularly when cankers are young. This should be followed by sealing with an orange shellac and a thin coat of asphaltum tree dressing. Kolofog sulfur has also shown promise as a wound dressing when used at 4 oz per pint of water (2). In Florida, keeping trees in good vigor and delaying pruning until just prior to blossoming help reduce the incidence of *Cytospora* canker. Also, since drought conditions appear to increase this problem, consideration should be given to timely irrigation practices.

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BACTERIAL CANKER OF PEACH IN FLORIDA

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Abstract. Bacterial canker caused by *Pseudomonas syringae* is an important disease of stone fruits in the Pacific Coast and southeastern United States. Although generally recognized as a weak pathogen, the organism has, in the southeast, been associated with the short life of peach trees. In 1973 the disease was identified on peach trees in Florida for the first time. Symptoms of the disease are described and control methods are discussed.

Florida's peach industry ranks 10th in the United States based on tree population. According to the Florida Crop and Livestock Reporting Service there were 807,000 peach and nectarine trees in the state on approximately 7,500 acres. The vitality of the industry is reflected in the fact that in the past 2 years there has been a 25% annual increase in peach acreage. Peaches are grown commercially in northern Florida, primarily in Madison County, and several areas in central Florida.

The major diseases affecting peaches and nectarines statewide are phony peach, brown rot

(*Monilinia fructicola* (Wint.) Honey), scab (*Cladosporium carpophilum* Theum.), and rhizopus rot (*Rhizopus* sp.). In certain areas clitocybe root rot (*Clitocybe tabescens* (Scop. ex Fr.) Bres.) and rust (*Tranzschelia discolor* (Fckl.) Traz. & Litv.) are also serious problems.

Recently bacterial canker, a disease heretofore unreported in Florida, was found on peach trees in Madison County. The disease is known in most of the stonefruit producing regions of the world but is of most importance in the Pacific coast (1) and southeastern states where it has been associated with the decline or short life of peach trees (4). Some of the symptoms of bacterial canker, winter injury, and general physiological stress are difficult to separate. The purpose of this paper is to describe the disease and relate its destructive potential to growers, fruit crop specialists, and agricultural extension personnel.

Symptoms

In 1972 several 6-year-old peach trees died suddenly after setting fruit and foliating normally. The following year symptoms of stress appeared in neighboring trees. Most of the affected trees bloomed normally but began to exude gum from scaffold limbs and trunks as the leaves were appearing. During various stages of foliation, leaves wilted, yellowed, and died but usually remained attached to the branches. Cankers, which appeared as slightly depressed streaks or oval areas in the bark, were present on limbs, branches, and trunks. The tissues under the bark appeared brown or with brown streaks, watersoaked, gummy, and were sour smelling. Scaffold limbs and branches were

covered with a fermented, rusty-brown, watery exudate. Necrotic streaks occasionally extended from the branch tip to the base of the trunk. In no case did a canker extend below the soil line. Necrotic streaks and cankers enlarged rapidly to girdle branches and eventually result in death of the trees. All trees which had noticable disease symptoms died in 1 to 5 weeks.

The Pathogen

Isolation from canker margins consistently yielded a grayish-white bacterium, which was gram negative and had polar flagella, characteristics of the genus *Pseudomonas*.

The organism produced a green fluorescent pigment on King's medium B, was oxidase negative and arginine dihydrolase negative. It was hypersensitive positive when injected into tobacco at 10^8 cells/ml.

The results of these diagnostic tests indicated that the bacterium associated with cankers of peach trees is *Pseudomonas syringae* van Hall the causal agent of bacterial canker of stone fruits.

Discussion and Recommendations

Pseudomonas syringae is a rather weak pathogen (1), which attacks trees predisposed to infection through adverse environmental or cultural conditions. The trees observed in this study had

for the last 2 years been pruned in November before they were completely dormant. Dowler and King (2) reported that in inoculation experiments, trees pruned early were most susceptible to bacterial canker with susceptibility decreasing rapidly until February when trees were almost immune. Since the disease cannot be satisfactorily controlled with bactericides (1) it is recommended that trees be pruned as late as possible (in February) to avoid possible predisposition to development of bacterial canker. Growers should also be aware that the bacterial canker organism can be spread from infected budwood sources to June-budded nursery trees (3). Infected nursery stock cannot be detected by visual examination; therefore, the grower should select propagating material from disease-free scion source trees or purchase trees from reputable nurseries. Until more is known about the occurrence of *P. syringae* in Florida orchards, it would seem prudent to destroy all infected trees as soon as they are identified.

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SPRINKLER AND SOAKER IRRIGATION OF PEACH TREES TO REDUCE PLANT WATER STRESS AND INCREASE FRUIT SIZE¹

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Abstract. 'Early Amber' peach trees were irrigated using intermittent daily sprinkling, soaker hoses, and recommended overhead sprinklers. The first 2 systems were designed to maintain a constant soil moisture level near field capacity. The

intermittent sprinkling, in addition, modified the trees' environment through evaporative cooling. On trees with about 300 fruit, sprinkling produced the largest fruit yielding 47% that were 2 inches or larger in diameter, while trees irrigated with soaker hoses yielded approximately 18% and the controls 10%.

Low chilling short-cycle peaches and nectarines grown in Florida require from 68 to 70 days from bloom to fruit maturity. Selective removal of all but about 350 fruit per tree is required if peaches are to reach 1½ to 2 inch size required for very early markets. This fruiting situation is unique,

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