



Branches of Blenheim apricot with leaves showing cupping and marginal leaf scorch often associated with *Cytosporina* dieback. Branch to right is from a healthy tree.

of the cankers near the ground line, crown rot is more easily confused with *Ceratocystis* canker than with *Cytosporina* dieback.

Ceratocystis canker usually may be distinguished from *Cytosporina* dieback in that most cankers are centered at bruise injuries in the trunk and lower scaffolds, caused by harvesting or cultivation equipment. *Cytosporina* cankers, on the other hand, develop almost entirely at pruning wounds.

Until research now underway is completed, California apricot growers must depend largely on information obtained by Australian investigators, including these control suggestions:

(1) All dying or abandoned apricot trees in the vicinity of commercial apricot orchards should be removed and burned. Nearby dead or weakened grapevines should also be removed because they may harbor *Cytosporina* fungus.

(2) Infected limbs should only be removed and burned when the spring rains have ceased. Otherwise, fresh pruning cuts made in the fall and winter may provide entry points for the fungus. Spores are produced most abundantly during the wet months. Where possible, cuts should be made one or two feet below external signs of infection. If, after a cut is made, there is evidence of discolored wood on the freshly exposed surface, another cut must be made below it, after sterilizing the saw. Pruning tools

should be sterilized after cutting through a canker by using a 5% formalin solution. This is prepared by adding five parts of commercial formalin (approximately 40% formaldehyde) to 95 parts of water.

(3) Seal large pruning wounds with a grafting wax or oil base paint.

(4) Using a modified system of pruning will reduce cuts on the main leaders to a minimum. Young trees should be headed back in the usual way during the first two years and the fresh wounds coated with one of the materials mentioned previously. Pruning can be reduced to a minimum thereafter and confined to the laterals which should be cut as far from the leaders as is possible. Bearing orchards may be converted to this modified system of pruning in some cases. The procedure confines potential infection to the laterals and permits removal of the infected portions without sacrificing leaders. This modified system of pruning has not been tried extensively in California, and caution should be exercised in its adoption on a large scale.

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Sprinkler OF CONTAINER

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Advantages of using overhead rotating sprinklers to irrigate container plants in the nursery outweighed disadvantages in a recent trial at Sacramento. Some of the factors to be considered in each case to determine feasibility include: soil drainage, size of plants, costs of system, water needs, water quality, and evaporation.

OVERHEAD rotating sprinklers were used effectively at Sacramento to irrigate container plants grown on a wholesale nursery basis. The sprinklers were installed in an 8-foot lath house as well as in uncovered can areas. The sprinkler system was arranged so that the risers were placed along the sides of the roadways and at the end of the can beds. As near as possible, an average spacing of 30 x 46 ft. was used. Part-circle heads were used along the main roadways and the edges of the lath house, and full-circle heads were used at all other locations. The sprinkler heads applied four gallons per minute, operating at 50 pounds per square inch, and giving an application rate of 0.279 inch per hour. The depth of irrigation was controlled by the length of time the system was allowed to run. Nutrient solution was added to the irrigation water at each irrigation, and an excess of water over consumptive use was applied to prevent a salt buildup in the cans. All main lines and lateral lines were buried to prevent interference with

Irrigation

PLANTS

L. J. BOOHER

vided along the roads and walkways. Tall bushy plants such as some specialty items cannot be irrigated with sprinklers because of the excessive height of riser required and the difficulty encountered in getting the water through the foliage and into the cans.

The initial investment for a sprinkler system is extremely high. It may run as much as \$1,000 per acre, not including the development of a water supply. The use of water is increased because the entire area is sprinkled rather than just the cans. If fertilizer is applied through the sprinkler system, the use will increase

proportionally. It is not possible to vary the rate or quantity of water applied within one control area. This requires the placing of varieties with similar water requirements within one control area. In areas of high evaporation and water use, water quality may be a limiting factor in the use of sprinklers. Competent advice should be obtained before expenditures are made for a sprinkler system.

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other cultural operations of the nursery. Each riser was protected by a stake to prevent damage from vehicles.

A pressure-actuated valve was installed for each control area and all the valves operated by a master control clock. The time and length of irrigation for each control area can be preset, with a different time interval for each control area if necessary. A typical section of the system is shown in the drawing.

The sprinkler system has some advantages over a hand-watered nursery operation. First, and perhaps most important, labor requirements are greatly reduced and supervision is cut to a minimum. Only six persons are now employed for watering as compared with 28 formerly needed. Hose costs are eliminated in areas where sprinklers are used exclusively. Sprinkling has also made it possible to grow certain shade plants in full sun without the added expense of a lath or plastic-covered house.

Disadvantages

There are also some disadvantages to the use of sprinklers in a nursery. Unless the operation is located on a very permeable soil, provisions must be made for surface drainage to dispose of the water which does not fall in the cans, as well as the excess water applied for drenching. In this field installation, the cans were placed on a bed of sand raised six inches above ground level. Drainage was pro-

TYPICAL SECTION OF SYSTEM

