

Department of Plant Pathology  
University of California, Davis  
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PROGRAM AREA: Fruit Quality and Production

PROJECT LEADER: J. M. Ogawa

PERSONNEL: Cooperative work with W. E. Yates, and N. Akesson of  
Agricultural Engineering on application of fungicides.

Graduate students: D. E. Ramsdell on eradicant fungicides  
and blossom blight protection; Dale Ravetto on fruit  
rots

Technicians: Bill Manji and Elaine Bose

OBJECTIVES: To develop an effective control program for diseases on prunes  
which can be integrated with present and future cultural practices.

WORK IN PROGRESS:

A. Control of brown rot with fungicides:

Control of brown rot was directed at three periods starting with the dormant spray, delayed dormant and blossom sprays, and preharvest sprays. The major objective is to reduce the inoculum potential (spores of the fungus) which increases the effectiveness of blossom blight protectant fungicides, reduces the number of incipient infections (fruit infections that develop later), and the possibilities of fruit rot following inclement weather or after infestation with insects.

Winter eradicant sprays with Benlate were shown to be effective when 8 oz. active Benlate were used but only 4 oz. were required when mixed with 1-1/2 gallons of dormant (Supreme) oil in 100 gallons of spray. This treatment, unlike the sodium pentachlorophenate, can be used without undue precautionary measures and can be applied as a mixture with insecticides.

Blossom sprays with Benlate and oil mixture were shown to be more effective than Benlate sprays applied at the delayed dormant bud stage. This provides a longer period of time to apply protectant sprays for blossom blight control which can be important especially during inclement weather. From results obtained in 1970 there is also a good possibility that aircraft application of fungicides such as Benlate can be effective. Coverage from helicopter application was outstanding.

B. Epidemiology and control of prune leaf rust:

During 1969 hand-gun applications of fungicides at the time of initial detection of rust pustules on leaves provided excellent control. During 1970 maneb was compared as a ground spray application with ground dust and air application. These studies showed that ground spray afforded the best protection, but air dust also provided significant control.

### C. Russet scab of prune fruit

Because of low incidence of russet scab no additional information was obtained. The critical information needed is to determine the cause of russet scab and whether Benlate will control the disease. If so, Benlate could be applied at bloom-time for combined brown rot and russet scab control. Trees planted at Davis for this purpose are in its second leaf. Although studies on russet scab will not be possible with these trees during 1971, they will be used for studies on prune leaf rust.

#### EXPERIMENTS COMPLETED:

##### A. Control of brown rot with fungicides

1. Proved that Benlate as a protective fungicide at blossom time is superior to other currently recommended fungicides.
2. Benlate can be mixed with supreme oils and with commonly used insecticides without reduction in disease control.
3. Delayed dormant applications can effectively control blossom blight.
4. Benlate plus supreme oil applied before sporodochial development will suppress their production.

##### B. Epidemiology and control of prune leaf rust

1. Protectant fungicide such as maneb applied after the first appearance of rust pustules provides good protection to unaffected leaf areas.
2. Application of maneb dust by airplane provided some protection and additional tests are warranted.

##### C. Russet scab of prune fruit

1. Captan or dichlone applied at full bloom controls this condition, while sulfur provides erratic control.
2. In years of slight russet scab, spraying blossoms at popcorn stage of bloom reduced the disease.

#### WORK PLANNED

##### A. Control of brown rot with fungicides

1. Determine the systemic activity of Benlate, Benlate and oil, and Benlate in acid pH (1.5) on blossoms and fruit.
2. Determine the systemic activity of Botran in fruits.
3. Determine whether control of blossom blight can be controlled by aircraft application of Benlate, if approved for use; otherwise tests will be made with other fungicides such as Difolatan or captan.



### B. Epidemiology and control of prune leaf rust

1. Aircraft application of maneb dust to determine effectiveness of control when fungicides are applied at the first appearance of rust.
2. Study the pattern of spread of rust and its mode of overwintering on trees planted on the Davis campus.
3. Complete the report on epidemiological studies started by Corbin and since continued by the Department.

### C. Russet scab of prune fruit

1. Determine effectiveness of Benlate, Difolatan, and Thiophanate for control of russetting.
2. Attempt to determine cause of disease.

### MAJOR ACCOMPLISHMENTS TO DATE:

1. Demonstrated that Benlate can be mixed with supreme oils and other insecticides for use during the dormant stage or for early bloom applications.
2. Effective fungicidal coverage of blossoms can be obtained with helicopter spray applications.
3. Benlate applied as a dormant spray can suppress brown rot sporodochial development.
4. Leaf rust of prune can be reduced by aircraft dust application of maneb.

### EVALUATION OF PROJECTS

A disease control program is being developed which will provide effective controls for brown-rot blossom blight, green fruit-rot, russet scab, and leaf rust. Expected is better disease control with reduced cost to the grower. This is possible through 1) combination of fungicide and insecticide sprays, 2) will need only a single application for blossom blight control, and 3) some evidence obtained that fruit sprays during the last month before harvest are not necessary, 4) development of methods for aircraft application of fungicides for use during periods when ground application is not possible or is difficult.

### PUBLICATIONS OR REPORTS

1. Ramsdell, D. C., B. T. Manji, and J. M. Ogawa. 1970. The effect of presporodochial benomyl and oil spray applications on the development of almond brown rot caused by *Monilinia laxa*. *Phytopathology* 60:1309.
2. Ogawa, J. M., B. T. Manji, and D. J. Ravetto. 1970. Evaluation of preharvest benomyl applications on postharvest *Monilinia* rot of peaches and nectarines.
3. Ogawa, J. M., B. T. Manji, D. C. Ramsdell, and D. J. Ravetto. 1971. Brown rot blossom blight and fruit rot controlled with benomyl and benomyl plus oil. Prepared for the 45th Western Cooperative Spray Project, Portland, Oregon, January 14 and 15, 1971.