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BROWN ROT A CAUSE OF BLOSSOM-BLIGHT AND FRUIT-ROT

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C. E. Owens, Plant Pathologist

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OREGON STATE COLLEGE -- EXTENSION SERVICE
Wm. A. Schoenfeld, Director, Corvallis, Oregon
Cooperative Extension Work in Agriculture and Home Economics
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Brown rot in its two phases, blossom-blight and fruit-rot, is one of the major diseases of stone fruits which during seasons favorable for its development causes losses in cherry, prune and peach crops ranging as high as 50 to 75%, either of blossoms killed at blossom time or fruit losses at harvest. 1/

During spring and summer seasons of light rainfall the losses may be light but whenever brown rot is present in the orchard during these seasons there is always the possibility that the losses can reach serious proportions at harvest time if weather conditions aid its spread and development.

There are measures which can be taken to protect stone fruit crops from brown rot attacks. It is the purpose of this circular to discuss such procedure.

1/ In Oregon there are two species of the brown rot fungus (Sclerotinia fructicola and S. laxa). The diseases caused by these species are known as the American Brown Rot and the European Brown Rot respectively. Either species is capable of causing both a fruit rot and blossom-blight.

BLOSSOM BLIGHT.

Blossom-blight is a type of brown rot injury which is not always readily recognized. Nevertheless the blossom-blight phase of this disease is important both because of the actual damage it does and because it helps to carry the disease over winter.

Symptoms.--The symptoms of brown rot injury on blossoms differ from the symptoms caused by weather conditions or failure of pollination. In brown rot the infection starts at some point on the flower, sometimes on the green calyx, sometimes on the petals, but quite often on the tip of the pistil or stigma where the pollen is received. The infected tissue turns brown. From the point of infection the browning gradually spreads backward over the flower, down the pedicel and may progress back into the spur, often killing it. The fungus may even proceed from the base of the spur into the branch and produce a small canker on the stem. Blossom-blight, spur-blight, and twig-canker are therefore different forms of the same disease. When a cluster of blossoms is blighted and the spur killed, the blossoms and leaves at the tip of the spur dry, shrivel, and remain on the spur, sometimes for a year or more. During wet weather throughout the following winter and spring, small, velvety, gray spore-tufts about the size of a large pin-head appear on the blighted blossom parts and spurs. These spores are a source of infection the next spring.

BLOSSOMS DAMAGED BY WEATHER AND LACK OF POLLINATION DIFFER.

When blossom fail to set good fruit due to weather conditions and lack of pollination, the symptoms are quite different. The petals drop normally and the fruit may start to form but usually remains undersized and falls sooner or later. In such cases, before they drop, the young fruit and fruit stems usually turn a sickly yellow all over. There is none of the progressive browning of tissues like that found when the blossoms are attacked by brown rot. A study of these conditions at blossoming time and following blossoming may enable one to determine whether or not one is suffering heavy losses from brown rot blossom-blight and thus one may know whether it would be advisable to carry out a regular blossom-blight control program each spring.

FRUIT ROT.

Brown rot may show up on the fruit at any time there is a prolonged period of wet weather. While the fruit is small and still green this disease may not be very abundant and it can be easily overlooked. Nevertheless when this condition exists there is enough of the disease present to carry it on through the summer and furnish the source for an outbreak on the maturing fruit. As the fruit approaches maturity the rot increases in intensity, particularly if there is much wet, damp or foggy weather.

Symptoms.--Brown rot on the fruit starts as small, brown, rotten spots which enlarge rapidly until the whole fruit becomes rotten. When the rot has spread extensively there usually appears on the surface of the rotted area powdery, ash-colored tufts or cushions of spores. If the humidity is high the fruit may become entirely covered with these spore masses.

OVERWINTERING AND SPREAD OF THE DISEASE.

There are three ways in which the disease may be carried over winter.

(1) On the Tree.--The cushions or tufts of spores which occur on the blighted blossom clusters and spurs may survive and be disseminated in the spring at blossoming time and thus serve as a source of infection for the next crop of blossoms.

(2) Rotted fruits frequently dry up and cling to the tree all winter. During the winter and spring whenever there is protracted rainy weather large numbers of spores are produced and scattered from these old mummified fruits. If these spores are disseminated at blossoming time blighting of the blossoms may occur provided there is sufficient moisture for spore germination.

(3) In the Soil.--A third means of overwintering is through rotten fruits which fall to the ground. These go into a condition of mummification and the fungus may remain alive for several years in these old mummies which are more or less covered with soil and debris. In the spring of the year these old weathered fruits produce a second kind of spore in small, brown cup-like growths arising from the mummies. These spores, if carried to the blossoms, may cause them to blight.

The young fruits and the maturing fruits may in turn become infected from spores produced on the earlier infected blossoms. Thus the disease is carried along all during the growing season and myriads of spores are always ready to infect and cause fruit rot whenever there is a rainy period, or heavy dew or fog.

A YEAR ROUND PROGRAM FOR CONTROL OF BROWN ROT OF FRUIT AND BLOSSOM-BLIGHT.

Since there are both blossom-blight and fruit rot stages of this disease any control measures recommended must necessarily take into account these two phases of the trouble. Also the different ways in which the disease overwinters must be considered.

Cultural Practices.

1. Remove and destroy all rotted and mummified fruits. Do not leave rotted fruits either on the ground or on the trees. They carry the disease over winter. Knock them off the trees, pick up and destroy or bury them. Allowing hogs to run in the orchard may suffice in cleaning up fallen fruit.

2. Remove and destroy all blighted spurs and blossom clusters. The disease overwinters on these also.

3. Prune to aid tree ventilation.

4. Plow the orchard before blossom time and cultivate at weekly intervals in order to prevent the formation of the spore-bearing cups or any mummies which might be on or in the ground.

Sprays and Dusts.

1. Pre-blossom spray.--Spray with 3-3-50 Bordeaux when the blossoms are showing color just before opening. This is to prevent blossom blight.

2. Petal fall spray.--Where blossom blight is a serious problem spray again with Bordeaux 3-3-50 as soon as most of the petals have fallen.

3. First fruit spray.--As soon as the shucks fall. Use wettable sulphur or sulphur dust. Neither Bordeaux nor regular lime-sulphur are absolutely safe to use after the fruit sets and the leaves are out. In some of the eastern and mid-western states lime-sulphur is used, especially on sour cherries, but in general, here in Oregon, wettable sulphur or sulphur dust is recommended for summer applications.

4. Summer sprays.--The application of wettable sulphur or sulphur dust may be recommended at monthly intervals during the summer where the disease regularly has been serious.

5. Pre-harvest sprays or dusts.--As the fruit approaches maturity it becomes more and more susceptible to attack by the brown rot fungus. A protective covering of wettable sulphur spray or sulphur dust is essential at this time. Apply 2 to 4 weeks before harvest. Sulphur sprays or dusts applied just before harvest will do much to protect the fruit from brown rot attack immediately following picking.

If the cultural practices recommended above are followed carefully, brown rot may be controlled in many well ventilated locations by carrying out the spray recommendations under one and five. However, if the orchard is quite seriously affected it may be necessary to include the second (Petal-fall), and the third (First fruit) sprays together with at least one of the summer sprays in order to get good control. In other words, sprays number one and five are the absolute minimum which should be used, and a higher degree of insurance against disease could be obtained by the use of the other sprays.

Prune, cherry, and peach orchards on moist lands and crowded locations may require the carrying out of the full schedule of recommendations.

Note.--It is very essential to insist upon the best quality of sulphur for spraying and dusting. For dusting, use a very fine sulphur which will pass through a 300 mesh sieve, or even finer if it can be obtained.

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