

AGRICULTURAL EXPERIMENT STATION  
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Circular of Information No. 202  
(Revision of Cir. of Inf. No. 121)

July, 1939

BACTERIAL GUMMOSIS OF CHERRY

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Bacterial gummosis is one of the major troubles encountered in our young sweet cherry orchards. Apparently the same disease may sometimes attack peaches, apricots, plums and prunes, as well as cherries. The tendency toward gumming is common in all stone fruit trees. Not all cases of gumming are due to the attack of the specific organism which causes the true bacterial gummosis of cherry trees. Any injury to the bark, whether due to borers, parasitic organisms, weather conditions, accidental wounding by man, or other agencies, may cause gumming. This circular will deal chiefly with the distinctive and characteristic disease caused by a species of bacteria (Phytomonas cerasi) and correctly known as bacterial gummosis, bacterial canker, or bacteriosis.

Symptoms of the Disease

On branches.---The typical bacterial canker is sometimes more or less elliptical in shape and on the larger branches and trunk may extend for several inches in a vertical direction. In some cases the disease may run for many inches, even a foot or more up and down the branch forming a long narrow canker. Frequently the branch is completely girdled resulting in the death of the branch. At first the canker is difficult to recognize, being only a discolored area in the bark. As the disease progresses the outer bark becomes dried out and stretched tightly across the canker. When callus formation begins in the spring the center of the canker appears sunken in comparison with the raised callus around the margin of the canker. Large quantities of gum ooze out over the surface or around the margin of the canker particularly when the tree resumes active growth in the spring. If the progress of the canker is stopped before the branch or trunk is completely girdled the old dead bark eventually sloughs off leaving the dead wood exposed. If the canker is large there is great danger that wood rotting fungi may enter through the wounds.

Bud Blight.--- Cherry buds are frequently attacked by this disease during the fall and winter. Such buds fail to open in the spring and seriously affected trees may show a high percentage of dead buds. The disease often kills not only the buds but the spurs to which the buds are attached and frequently small cankers are formed on the branches at the bases of diseased spurs. Blighted buds and spurs, and the small cankers sometimes produced at the base of these blighted parts also may exude gum.

### Period of Activity

The bacteria causing this disease are active during the winter or the dormant period of the tree. The method of transmission from tree to tree is not known, but insects have been suspected. It is probable that rain spreads it particularly from one part of the tree to another after it once becomes established on a tree. At any rate, the bacteria start new infections and spread in the bark during the winter months, but when the tree begins growth again in the spring a callus is formed around the margin of the canker and it ceases to enlarge further. The next winter the bacteria become active again, enlarging present cankers or starting new infections somewhere else on the tree.

### Methods of Control

This disease is difficult to control. No means of preventing the dissemination of the gummosis bacteria are known, and the disease has not been successfully controlled by sprays. The two possible ways of combating the disease used in the past are (a) surgical treatment and (b) use of resistant stocks.

#### Surgery

Cutting and scraping out the diseased bark from a canker and shaping up the margin of the healthy bark surrounding the canker so as to encourage the formation of a healthy callus has long been recommended as a standard treatment for gummosis. The bark should be removed back to clear healthy wood on all sides of the canker. The final cut edge of the bark should be perpendicular to the surface, not sliced off. Point up the ends of the wound; do not leave them square across above and below. After the diseased bark has been removed the exposed wood should be disinfected with a 1-1000 solution of corrosive sublimate. When the wound is large the exposed wood should be covered with Bordeaux paint to exclude wood rots. (See last paragraph of this circular.)

The surgery should be done as early in the spring as practicable. During the winter the cankers are difficult to locate, but as spring comes on they become more evident. Wherever possible cankers should be removed as soon as discovered.

#### Resistant Stock

It has been observed that a large percentage of Mazzard seedlings (sweet cherry seedlings) are more or less resistant to gummosis. Such seedlings may be planted in the orchard and when two or three years old may be "de-horned" and budded or grafted to Bing, Royal Anne, or other desirable but susceptible varieties. In this way one can secure a trunk and scaffold branches of resistant stock which insures that even though an occasional branch may be killed there is less likelihood of losing an entire tree.

#### A New Treatment

Several years ago L. H. Day of the California Agricultural Experiment Station suggested a new treatment for gummosis. This treatment consists essentially in cutting a series of parallel vertical slits in the bark through and surrounding the canker and disinfecting the slit surface by either painting or spraying with a solution of copper nitrate. Day's directions are quoted below:

"The slits are made parallel to each other and approximately one inch apart. They begin about 10 inches above the upper margin of the canker and extend a like distance below. The slits must go clear through the bark and should follow the natural grain of the wood, because the disease will occasionally pass through or beneath slits which cross the grain. The disinfectant may injure some of the adjacent bark if the slits cross the grain too sharply or cross each other, or if they are made too close together. A strong pocket knife can be used for slitting young trees; but for older, thick-barked trees a butcher knife with the blade cut off (straight across) to a stub about 1-1/4 inches long makes a better slitting knife.

"In making the slits, the best plan to follow is to make the central slit first, passing through the center of the canker. The side slits are then made parallel to the first and are as numerous as necessary to get a safe distance beyond the sides of the canker. The disinfectant solution is then applied to the whole surface, being allowed to creep freely into the slits. If there are many cankers to treat, it is best to use a bulb syringe throwing a solid stream. For treating a few cankers, a paint brush is sufficient."

Day further states that, during the late spring and summer following slitting, in cases where large areas of bark had been killed before treatment, the dead bark should be scraped out and the exposed wood treated with Bordeaux paint to prevent wood-rots.

Caution: The copper nitrate solution should not be applied to newly scraped cankers, nor to large fresh wounds made in sawing off large branches.

#### Copper Nitrate Solution

Day's formula is as follows:

"1 ounce copper carbonate  
2 quarts water  
1-1/2 ounces concentrated nitric acid  
1 gallon denatured alcohol

"Stir the copper carbonate into the water and add the nitric acid. After the copper carbonate is all dissolved (as indicated by clear blue solution and ceasing of effervescence), add the denatured alcohol. The solution should be prepared in glass or enamel ware and kept in bottles tightly corked."

#### Good Results Reported in Oregon

The copper nitrate treatment has been tried out in Oregon by O. T. McWhorter, Extension Horticulturist at the State College, and by a few County Agents at various points in the state, and all report promising results. Not only is it beneficial in the case of the true bacterial gummosis, but in case of other canker-like or unhealthy conditions the application of the copper nitrate after slitting the bark appears to have a decidedly stimulatory effect, inducing callus formation and rapid healing, according to these extension workers.

Wound Disinfectant

In all cases where areas of bark of any size are killed all loose or dead bark should be trimmed back to healthy tissue. Where branches of two inches or more in diameter have been cut or broken off the stubs should be cut off flush with the surface of the trunk. Then, in order to prevent the entrance of heart rot fungi, all exposed wood and bark should be covered with an antiseptic coating. Bordeaux paint, made according to a formula developed by S. M. Zeller of the Oregon Experiment Station, has given excellent results if applied after the exposed wood has dried out thoroughly for several weeks and callus formation has begun. If Bordeaux paint is applied to the freshly cut surface serious injury to the cambium layer may result. This paint must be made the day it is used. The best procedure is to slowly stir raw linseed oil into a quantity of commercial Bordeaux powder until a very smooth paint is formed.

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