## **Elimination of Crown Gall**

treating small galls on young trees with Elgetol-methanol mixture assures control in almond, peach, walnut orchard

**Crown gall** in an orchard can be controlled and should not become serious if care is exercised so cultural practices do not injure the trees.

Crown gall—caused by the bacterium, Agrobacterium tumefaciens—is of economic importance in almond, peach, and walnut orchards in California. It annually kills many productive orchard trees and is a restricting factor in growing almonds and peaches but it is of limited occurrence on pears.

The crown gall organism establishes itself in the tree only when introduced through wounds. Once inside the tissues the bacteria multiply between the plant cells near the exterior and are always close to the surface of the gall. With the sloughing off of the epidermis or outer parts of the gall many bacteria are discharged into the soil where they survive for a considerable time.

The occurrence of crown gall in an orchard is associated with cultural practices. In orchards where the trees are shallow rooted, and much deep disking is done, the trees may have large numbers of galls on the lateral roots as well as on the crown where wounds have admitted the crown gall organism from the soil.

The incidence of crown gall in an orchard can be reduced by careful cultivation to avoid bruising or injuring the root system.

Once a gall starts at the crown of a tree—one of the most serious locations it seldom stops growing unless corrective measures are taken.

One way to stop a crown gall is to cut off the gall growth and disinfect the cut surfaces with a germicide which is noninjurious to the tree.

A second—and commonly used method to stop crown gall is to paint the surface of the gall with an Elgetolmethanol solution. This method has some imperfections but it has proved satisfac-

Chiseling the gall after it has been exposed and cleaned with brushes.





Crown gall on a young almond tree. Trees like this can not be saved.

tory when applied to galls on almond and peach. On walnut it is necessary first to scrape off all galled tissue and about an inch beyond the visible margin of the gall. Then the exposed surface is painted carefully with the Elgetol-methanol solution.

The Elgetol-methanol mixture is prepared by mixing one part of 20% Elgetol and four parts of synthetic wood alcohol, known as methanol. If only 30% Elgetol is available the mixture should consist of one part of 30% Elgetol and  $6\frac{1}{2}$  parts of methanol.

In preparing a gall for this treatment it should be exposed to the air by cleaning the gall with a brush. The surface of the gall must be freed from as much dirt as possible, because a clean surface per-

Crown gall of peach, probably the result of infection following wounding with a plow or other implement. Tree about 15 years old.



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mits better coverage and penetration of the chemical.

In treating galls it is important to coat them thoroughly with the Elgetolmethanol solution, extending the application about one half to one inch into the area of healthy bark beyond the margin of the crown gall.

The greatest value from crown gall control is derived in young orchards. On young trees, galls can be treated while they are still small, insuring an easier eradication of the disease. Furthermore, the greater vigor of the younger trees makes for more rapid healing of the treated areas.

Treatment of galls on old trees usually is not practical where the gall occupies most of the circumference of the crown and the bases of the large lateral roots. It is better to pull out such trees and replant.

The best time of the year for gall treatment is the fall or winter when digging is easier and the labor supply more plentiful. Severe injury has been observed on almond trees which were treated for crown gall by this method during hot weather.

Galls treated with the Elgetol-methanol mixture die gradually over a period of a few weeks to several months, depending on climatic conditions.

All wounds made during the preparation for the treatment should be disinfected with a light dressing of the Elgetol-methanol mixture and covered with a good sealing mixture, such as a grafting or pruning wound compound as a protective measure.

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Painting an exposed crown gall with the Elgetol-methanol mixture.

