

KANSAS STATE AGRICULTURAL COLLEGE.

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DEPARTMENT OF ENTOMOLOGY.

## The Spring Canker-worm Situation in Kansas.

GEO. A. DEAN.

The injuries sustained in Kansas by the ravages of the spring canker-worm have extended over a period of several years. Last year this injury was very serious. For instance, the spring canker-worm killed more apple trees in Kansas in a single season than the San José scale has killed during its entire history as a pest in the state.

The injury done by the canker-worm is not confined to fruit trees; it also attacks a number of our most valuable forest and shade trees. Last spring the elms over a large portion of the state were partly, and in many cases completely, defoliated by the spring canker-worm. The injury caused by this insect, together with the dry, hot weather which followed the attack, killed a large number of elms. Many of the trees that were not killed were weakened, and thus rendered susceptible to the attack of woodborers. Yet, notwithstanding this great loss to orchards and shade trees, many fail to realize the importance of combating the insect until it has done a large part of its destructive work. The canker-worms are almost certain to prove serious during the coming season, and unless every effort is made to prevent them from injuring the trees, the danger will assume large proportions.

### DESCRIPTION OF THE CATERPILLARS AND MOTHS.

The spring canker-worm is among the most common of the "loopers" or "measuring worms." The full-grown caterpillar is from three-quarters to an inch and a quarter long, slender, naked, and cylindrical. (Fig. 1.) The color varies, but the

predominating color is dark greenish-olive or blackish, marked with narrow pale lines down the back and a whitish stripe along each side. If disturbed on the branch it will drop suddenly, suspended by a fine silken cord.

The wings of the male moth expand a little more than an inch. The front wings are semitransparent, brownish-gray in



FIGURE 1.—Full-grown spring canker-worms. One and one-half times natural size. (After Slingerland and Crosby.)

color, with three rather indistinct dark lines across them. (Fig. 2.) The hind wings are of a pale ash color, much lighter than the front ones. The females are wingless, and at the first glance look much more like spiders than moths. (Fig. 3.) They are about one-third of an inch long, of a dull brownish or grayish color, with a dark stripe down the middle of the back.

HABITS AND LIFE HISTORY.

While several of the male and a few of the female moths emerge during the fall and winter months, the great majority emerge in early spring from pups, in which stage they pass the winter from two to five inches beneath the surface of the ground. Sometimes many of the moths emerge during a warm



FIGURE 2.—Spring canker-worm, male moth. Two times natural size. (After Slingerland and Crosby.)

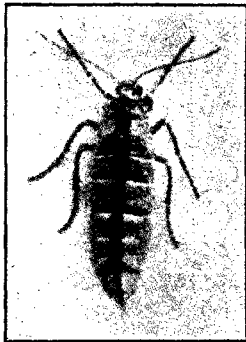


FIGURE 3.—Spring canker-worm, female moth. Two times natural size. (After Slingerland and Crosby.)

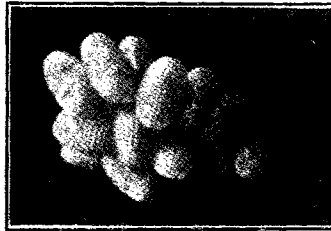


FIGURE 4.—Eggs of the spring canker-worm. Enlarged. (After Slingerland and Crosby.)

spell in February, but it is usually in March that the principal emergence takes place. The wingless, grub-like females crawl up the trees and deposit their oval-shaped, yellowish eggs in irregular clusters, or masses, on the branches. (Fig. 4.) The eggs are usually placed in sheltered places formed by fruit spurs and leaf scars, or they are concealed beneath pieces of loose bark or at the base of large branches. A single female

moth may lay over four hundred eggs. They hatch about the time the apple tree unfolds its leaves, or about the time it is in full bloom, and the young worms greedily devour the blossoms, leaves, and the setting fruit. They grow rapidly and feed ravenously, and when abundant will completely defoliate orchards and shade trees in a few days. Usually they reach their full size in from three to four weeks after hatching, and then pass to the ground, either by crawling down the trunk of the tree or by lowering themselves by the silken threads. They enter the ground, transform to pupae, and remain here until the first warm days of the spring or late winter. There is only one generation produced each year.

#### METHODS OF CONTROL.

*Cultivation.* After the worms have entered the ground to pupate just beneath the surface, large numbers may be destroyed by thorough cultivation of the orchard. This should be done during the summer and early fall.

*Spraying.* The caterpillars may be quickly destroyed by spraying with arsenate of lead, using from two to three pounds to fifty gallons of water. The first spraying should be done as soon as the foliage is partly expanded and before the trees bloom, and the second spraying should be given as soon as the blossoms fall. In other words, if the apple trees are thoroughly sprayed for the control of the curculio and the codling moth they are never seriously injured by the cankerworm. Usually the first spray (also called the cluster-cup spray) is the more important, as the young caterpillars are much more easily killed.

*Banding.* Where, for any reason, spraying is not feasible, and in the case of shade trees or of a few fruit trees, a simple method, and one that gives excellent satisfaction, consists of banding the trunk of the tree with a sticky substance to prevent the ascent of the wingless females. The best method is to smear the sticky substance on bands of heavy paper, such as building paper or tarred paper, bound to the trunk of the tree. The paper bands should be about six inches wide and the sticky substance should be smeared in the middle of it. The bands should be put on during the first warm days of early spring, and the sticky substance renewed whenever the material hardens. Either cotton should be stuffed behind the band to

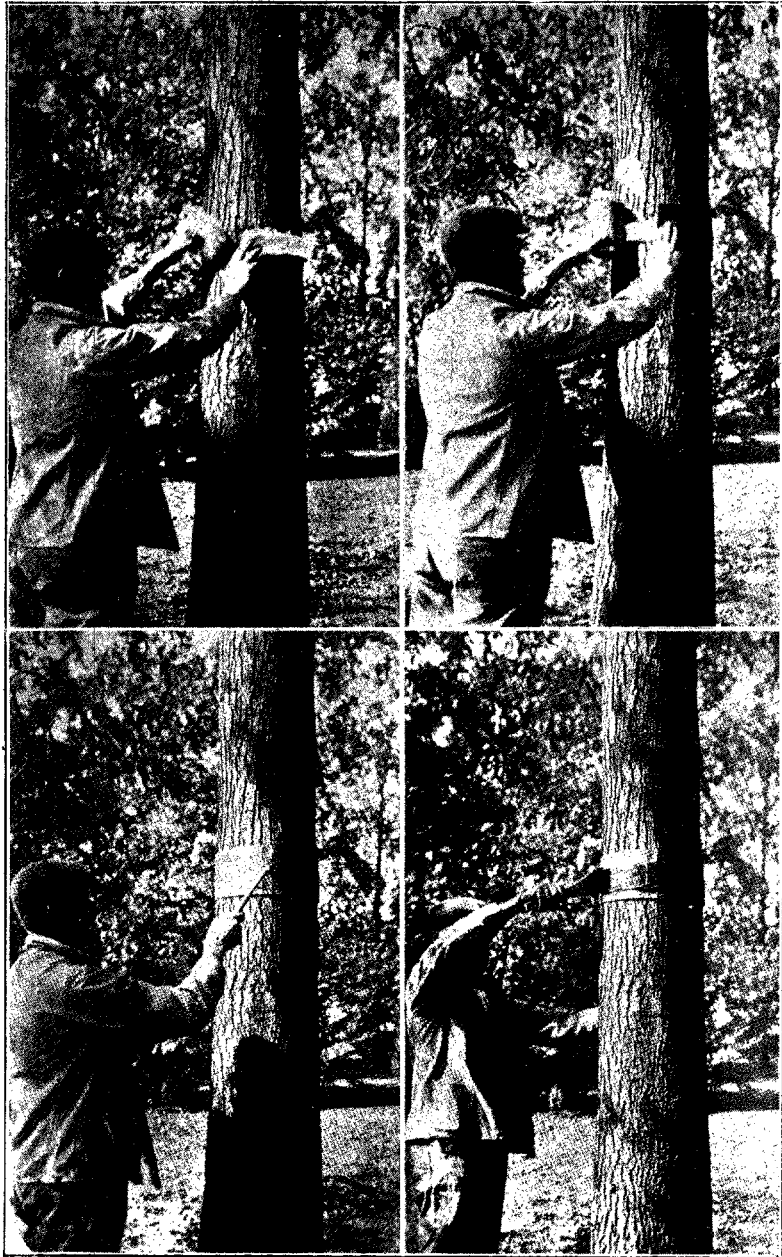


FIGURE 5.—Method of applying sticky bands to protect trees from canker-worms.  
(After Britton.)

close all crevices between the tree and the band, or a strip of cotton batting (cheapest grade) about two inches wide should first be placed around the tree, and this covered with the band of tarred paper. The paper should be drawn snugly enough to press the thick band of cotton into the crevices. (Fig. 5.) The band can be easily fastened at the end with three sharp-pointed tacks about three-fourths of an inch long. If the paper band is much wider than the narrow cotton one it will completely cover it, and thus avoid the unsightly appearance of cotton showing either above or below the edges of the paper. (Fig. 6.)



FIGURE 6.—Adult male and female moths on sticky bands. Cotton completely covered. (After Britton.)

A number of substances of a sticky nature may be used, such as pine tar, coal tar, printers' ink, and dendrolene, but the best substance, and one that remains sticky for several days, is "Tree Tanglefoot," a preparation sold by O. & W. Thum Company, Grand Rapids, Mich. The "tanglefoot" should be spread upon the band with a wooden paddle, leaving a smooth coating about one-eighth of an inch thick. On badly infested trees it is sometimes necessary to comb or renew the

sticky substance frequently, as many of the females may be able to cross the bands over the dead bodies and wings of males, which may completely cover the sticky portion of the band. (Fig. 7.)

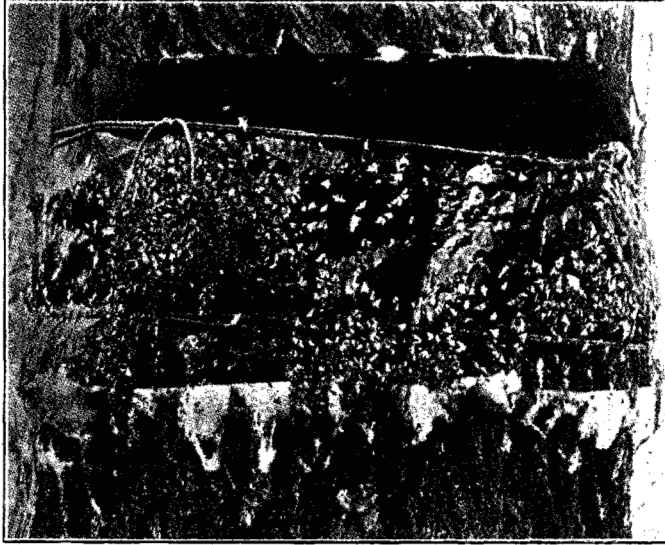


FIGURE 7.—Adult male and female moths on sticky band. Cotton stuffed behind the band. (After Slingerland and Crosby.)

The use of the sticky bands is especially recommended for large elms or other shade trees that would be difficult to spray. If the sticky substance is applied directly to the bark it will show as a disfiguring mark for many years, while if applied to bands of paper as described, the band can be removed from the tree at any time without leaving any sign or scar. Moreover, so much more of the "tanglefoot" is necessary to fill the cracks of the rough bark in making an efficient barrier that the cost equals that involved in the banding method.

To make a successful fight against canker-worms, too much emphasis can not be laid upon the necessity of beginning promptly. If the banding method is used, the bands must be on the tree early enough to prevent the ascent of the wingless female moths, which takes place during the first warm days of March, or even February. If the spraying method is used, the spray must be applied just as soon as the worms appear, which is usually about the time the apple tree unfolds its leaves.

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