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Controlling The Fruit-Tree Leaf Roller

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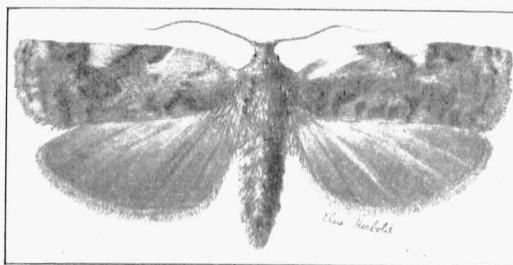


Figure 1.—Moth of the fruit-tree leaf roller (enlarged).

In the spring of 1938, the fruit-tree leaf roller (*Cacoecia argyrospila* Walk.) appeared unexpectedly in very destructive numbers, especially over the eastern part of the state. This was the first time since 1905 that the pest did serious damage to Missouri orchards. The set of fruit in the central and eastern part of the state was naturally light, due to late frosts, and in many orchards much of the fruit which did set was attacked and practically ruined by the leaf rollers. Under the conditions, the damage they did was out of all proportion to the number of leaf rollers present.

During the fall of 1938, a survey was made of the orchards throughout the state and it showed the pest to be largely concentrated in an area covering several counties extending north, south, and west from St. Louis. In some orchards, individual trees were found to contain from 50 to 100 packets of eggs, or from 5,000 to 10,000 eggs. In such orchards, the pest may be expected to do very serious damage to the foliage and fruit in 1939. Fortunately, not all orchards are severely infested and in heavily infested orchards not all trees or varieties show equal infestation. This report

has been prepared at this time to acquaint the fruit growers in the different parts of the state with the danger and to point out control practices which have proven effective under both heavy and light infestations.

History and Distribution of the Pest

The fruit-tree leaf roller is not a new pest. It has been recognized as a serious pest in different parts of the United States for half a century. In 1905, a destructive outbreak appeared throughout this state. A few years later it proved destructive in orchards throughout the northern and eastern states. During the last fifteen years the Rocky Mountain fruit-growing states have suffered loss by the pest and, in more recent years, it has caused trouble in Illinois. Its appearance as a scourge is usually sporadic but it may do serious damage while an outbreak lasts.

Life History and Description

The pest has normally but one generation a year. It survives the winter in the egg stage, cemented over and securely attached to the twigs and limbs of trees. These appear in clusters of from 25 to 75

or more eggs. The egg packets fit the curve of the twig and are about a quarter of an inch or less in length, as shown in Figure 2. The packets may be difficult to see when they have the color of the bark, but in other cases they have a whitish color and are easily seen. The old packets, from which the caterpillars have emerged, are usually light in color with numerous dark spots or exit holes in the surface of the cement coating.

In the spring usually about the time apple buds are in the cluster stage, the eggs hatch and the tiny caterpillars begin feeding in the opening buds, where they may do serious early damage. These small greenish or yellowish caterpillars feed and grow rapidly, destroying many blossoms before they open. As they grow larger they roll or tie the leaves together, or to the side of the developing fruit. In such cases, they usually eat gashes in the side of the fruit and ruin it. In severe infestations, most of the foliage as well



Figure 2.—Egg packets of fruit-tree leaf roller on apple twig (enlarged).

as the crop of fruit may be destroyed. When full-grown, the caterpillar is a little under an inch in length, very active, and greenish in color with a black head and thoracic plate. It usually squirms out of the folded or rolled leaf as one opens it, dropping to the ground or remaining suspended on a silk thread.

After becoming full-fed the caterpillar pupates in the folded leaves. The pupa is dark brown in color and is slightly over one-half inch in length. In from 7 to 10 days normally the moth emerges and within a week after emerging the female deposits all her eggs. She may deposit from 100 to over 200 eggs, usually in two or more packets. The moths are inactive during the day if not disturbed, but on warm days they begin to fly at dusk and come to the codling moth bait traps in great numbers. The moth is rather conspicuous, its front wings varying from a light to dark rust brown with yellowish blotches, while the hind wings are usually a light slate color, as shown in Figure 1. The moth measures about three-fourths of an inch across the expanded wings, and when at rest it is less than one-half inch in length.

Nature of Damage

The pest may cause serious damage to both the foliage and the fruit. The grower is especially concerned about the injury to the fruit. On hatching, the small caterpillars first feed in the opening buds and on the unfolding leaves and blossom clusters. Where abundant, they may do serious damage before the blossoms open. As the worms grow they fold the leaves or web them together or tie them to the side of the small fruits. Inside this leafy shelter they continue to feed. When fruits are included in the shelter they almost invariably eat away a part of the surface, thus deforming or completely destroying the fruits. Some growers, in 1938, reported that three-fourths of their crop was thus damaged. In very severe infestations, most of the fruit and much of the foliage may be destroyed. Some have reported almost complete defoliation of trees.

Besides apple, pear, plum, and cherry, the pest may attack most of the forest and shade trees and shrubs. Oak, elm and sassafras seem especially attractive to the pest. In orchards, those trees near woods or overgrown draws show heaviest attack.

Control

Where the number of leaf roller egg packets is large enough to threaten serious damage, that is, an average of from 25 to 50 or more packets per tree, a dormant oil spray should be applied. This spray should include 6 per cent of oil in the emulsion. The miscible oils used at the rate of 6 gallons of oil in 94 gallons of water will give the proper concentration. In the case of the lubricating oil emulsions, however, which contain approximately 65 per cent of actual oil, 9 gallons of the emulsion in 91 gallons of water should be used. Oil sprays of this concentration should be used only on trees in the completely dormant condition before the buds have begun to swell in the spring. Very thorough application is necessary if satisfactory control is to be obtained with the oil sprays, as the egg packets are usually located on the protected upper side of the twigs where they are not readily hit with the spray. Spray all the way through the tree from all directions. Only those egg packets wet with the spray will be destroyed.

Where leaf roller egg packets are present but not in numbers sufficient to warrant the application of a dormant oil spray, satisfactory control may be obtained by the use of arsenicals. Lead arsenate at the rate of 2 to 4 pounds per 100 gallons of spray mixture applied in two sprays, one in the late cluster bud stage and the other immediately after petal fall, will kill most of the newly hatched larvae before they have had time to spin themselves up in a protective cluster of leaves. Under conditions of particularly heavy leaf roller infestation, arsenical sprays alone have not given satisfactory control of the pest. In fact, under such conditions, arsenicals may also be required even after the dormant oil spray has been applied, as a sufficient number of the eggs to produce considerable damage may escape the oil.

As previously pointed out, serious infestations of leaf rollers during the spring of 1939 threaten to occur only in the eastern part of the state, and the dormant oil sprays are expected to be needed only in that area. However, the pest is almost certain to spread in destructive numbers to the rest of the state in the next year or so and if it does growers in those areas must be prepared to control it.