



Further Stages in the Life of the Codling Moth

Look at this fellow well so that you may recognize him when you see him. Illustration C shows the coddling-worm (larva) magnified three times and d the adult and egg on the fruit.

the Apple Tree Tent Caterpillar and the Tussock Moth, which spend the winter in the egg state in more or less conspicuous masses on the bark of trees, perhaps the most effective method of control is the destruction of the egg masses in the fall when the leaves have fallen.

Moreover, the Codling Worm (*Carpocapsa pomonella*) hibernates in a thick, greyish-white cocoon under bits of bark, in cavities of the wood, and in rubbish about the orchard. Many also are carried into fruit cellars, and in spring the moths produced from them find their way out to the orchard. The scraping of the tree-trunks in late fall and the destruction of loose rubbish would do much to lessen their numbers.

The Oyster-shell Scale (*Lepidosaphes ulmi*) is one of the most widespread insects of our Canadian apple orchards. It hibernates in the egg stage under the scale on the bark, and hatches in late May and June. A late fall spraying with whitewash when the trees are dormant, followed by another in midwinter, will cause most of the scales to drop to the ground.

FUNGUS DISEASES

A thorough cleaning of the orchard in late fall of all unnecessary rubbish and leaves is one of the best preventives of many fungous diseases, such as apple scab, brown rust, mildews, and leaf-spots. Many injurious fungi produce winter spores which mature in the dead

fruit and leaves during the fall, winter, or early spring. In early spring these spores, or spores produced by them, will inoculate the new leaves and young fruit.

The diseased fruit and leaves should be gathered and burned. They should not be thrown on the manure or compost heap, for then many of the spores which survive the winter will reproduce the disease the following season.

Trees affected with Black-rot Canker (*Sphaeropsis malorum*), Black Knot (*Playwrightia morbosa*), and twig blight should be thoroughly pruned and the cut ends disinfected. These three diseases are making rapid headway and the orchardist should give careful attention to the pruning of his trees.

IN THE GARDEN

A fall cleaning of the garden is even more imperative than that of the orchard on account of the smaller area under intensive cultivation. The great majority of the species of cutworms hibernate in the caterpillar stage, and lie concealed beneath old boards, clods, and so forth. The presence of poultry in the fall in the garden is conducive to the destruction of these as well as of many other hibernating insects. Such common sucking insects as the Tarnished Plant Bug (*Lygus pratensis*), the Squash Bug (*Anasa tristis*), the Leaf Hoppers (*Jassidae*), the pupae of the Squash-borer, the adults of the two species of Cucumber Beetles, and even the Potato Beetle, are

destroyed in large numbers by a careful fall cleaning of rubbish.

Deep fall plowing is a good practice, as many cutworms, wireworms, and white grubs and eggs of grasshoppers are killed by exposure to their enemies and to the freezing effects of winter.

BIRDS HELP

Probably the most important single factor in the control of the insects of the orchard and garden is the presence of winter birds such as the chickadees, nuthatches, kinglets, and woodpeckers, which feed upon the eggs of plant-lice, tent-caterpillars, fall cankerworms, the larvae of the codling moth, and the grubs of the shot-hole and apple tree borers. Hawks and owls are also extremely beneficial on account of their destruction of field mice, and should be encouraged. The birds can readily be attracted to orchards in fall and winter if baits of bone, meat, and suet are tied among the branches.

Clean culture in the garden, as in the orchard, in the autumn, the gathering and burning of the rubbish of dead stalks and leaves, prevents the development of many fungous diseases. For example, potatoes affected with rot and scab, turnips and cabbages with clubroot, asparagus with rust, and raspberries and blackberries with orange-rust, should be destroyed by burning, and not fed to stock or thrown on the compost or manure heap. In fact, with most of the common diseases one of the best preventive remedies is clean culture in the autumn.

Finally, but not least important, is the value of cooperation among fruit-growers for the prevention of attacks by insects and fungi. It is very essential that all owners of orchards and gardens, for example, do this important work of fall cleaning if the beneficial effects of the work are to be obtained. Municipal or state control would be advisable from the standpoint of prevention of losses.

Common Mistakes in Marketing Fruit

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THERE is one aim that stands out above all others in the minds of those engaged in any particular business, and that is to so shape or manipulate their operations as to enable them to secure the greatest possible profits. In order to reach this degree of perfection, there are two great essentials, namely, a close and careful study of conditions surrounding the particular business in which one is engaged, and then the application of business methods. This, perhaps, will apply more forcibly to fruit handling than to any other business.

In approaching the subject, "Common Mistakes in Marketing Fruit," one is likely to reach the conclusion, after a

study of the history of the fruit business up to a few years ago, that it has been one huge mistake or that it has consisted of a succession of mistakes. Perhaps the greatest mistake has been the one that was made by the grower when he divorced himself from the idea that he had anything to do with the marketing of his fruit. The common impression with the average grower seems to have been that when he placed the tree in the ground there his responsibility ended, and that every step to be taken further until the fruit reached the consumer, was within the province of dealers. This being the case the grower was not as interested in growing a good quality of fruit, nor in its proper har-



The Effect of Brown Rot on Plums

See mummified plums, as found on trees in February, still retain the ability to give off spores.