

more commonly after the worm has escaped. The larvæ which leave the apples while still on the trees, either crawl down the branches to the trunk of the tree, or otherwise let themselves down by a fine silken thread, which they spin at will, to the ground; in either case, the greater portion of them take refuge under the rough loose bark on the trunk of the tree, and there spin their cocoons. The second brood of moths appear from about the twentieth to the last of July. We have taken them on the wing at night as early as the nineteenth, but specimens confined in breeding boxes, have not, as a rule, made their appearance until about the end of the month. In the winged state they seldom live more than a few days, and in this brief space they pair, and the female deposits her eggs for the second brood of larvæ, and, for this purpose, wisely shows a preference for the later apples. The codling moth also attacks the pear, in some localities, most disastrously for the crop; the fruit, however, seldom falls to the ground until some time after the worm has left.

Dr. Wm. Le Baron, State Entomologist, of Illinois, has devoted much time and attention to the study of the history and habits of this insect, and has published in his last annual report an excellent paper on this subject. Mr. Riley, of St. Louis, has also made observations and experiments on this same insect, which corroborate those of Dr. Le Baron, these are referred to in the fifth and sixth annual reports on the noxious, beneficial and other insects of the State of Missouri; from both these sources we shall glean and make free use of such facts as we think will interest our readers.

The number of eggs each moth is capable of laying will, probably, average not less than fifty, but these are not all matured at once, but may be found, by careful dissection of the body of the moth, in various stages of development. Hence they must be deposited successively, the period probably extending over a week or more.

REMEDIES.

This is an all important matter in which, in this instance, man must rely chiefly on his own efforts, for although, doubtless, a large number of the worms and chrysalids are annually destroyed by birds, and another limited portion by parasitic insects, still from the advantageous shelter afforded them by the apple, and the fact of their movements after leaving it being mostly in the night time, the codling worm enjoys much immunity from natural foes.

Dr. Le Baron divides this practical portion of the subject, as far as man's work is concerned, into four heads, and here we cannot do better than quote from his excellent paper:—

"1st. Destroying the insects in their winter quarters.

"2nd. Picking the wormy apples from the trees.

"3rd. Gathering the wormy apples from the ground, or letting swine and sheep have the range of the orchard.

"4th. Entrapping the worms in bands and other contrivances."

1st. *Destroying the insects in their winter quarters.*—When we consider that each female moth is capable of laying fifty eggs or more, and that every worm of the first brood ruins an apple, we can see the importance of destroying these insects before they leave their winter quarters. We have already mentioned that in the state of nature, these worms pass the winter in cocoons, concealed under the bark, or in the crevices of apple trees. The summer brood of worms, which remain but two weeks in the pupa state, sometimes content themselves with a very slight protection, but it is the nature of the insect to seek deep concealment, and the instinct of the second brood, which is to survive the winter, leads them to search for the deepest protection they can find. We, therefore, rarely find them under shallow and loose scales of bark, but very often in deep cracks and crevices, partially embedding themselves in the substance of the wood or bark. Any superficial scraping of the trees, or whitewashing, or other outward applications would not, therefore, be likely to reach many of them; and inasmuch as they may be hidden upon any part of the trunk or large branches, any attempt to discover them with the intention of digging them out would, evidently, be impracticable; but at the point where we become powerless the woodpeckers come to our aid. In their search for just such hidden worms as these, those busy foragers unite business with pleasure, and all through the wintry day the sharp rattle of their beaks may often be heard in the orchard, as with ear intent and sharpened beak, and appetite not less sharp, they pursue their hidden prey with unerring and fatal precision.

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