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# New York Agricultural Experiment Station.

GENEVA, N. Y.



LARVA OF TUSSOCK MOTH AND ITS WORK.

## ORCHARDS INJURED BY TUSSOCK MOTH.

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SUMMARIZED BY

F. H. HALL.

FROM BULLETIN BY

W. J. SCHOENE.

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POPULAR EDITION  
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ORCHARDS INJURED BY TUSSOCK MOTH.

F. H. HALL.

**Old pest  
in new field.**

The white-marked tussock moth has been, at intervals for nearly a century, a noteworthy enemy of fruit trees and shade trees. During recent years it has become increasingly prominent as a destroyer of foliage in city parks and streets and has made it necessary for many cities and villages to adopt vigorous repressive measures. The attacks of the insect on fruit trees have attracted attention less frequently, though some of the caterpillars are found in many orchards every year. In 1895 quite a serious outbreak occurred in Ontario and Yates counties in this State; but since that time the numbers of the caterpillars have remained about normal until 1908, when they increased alarmingly over quite an area in western New York, particularly in the sections about Lockport, Ransomville and Middleport in Niagara County. Considerable damage was done to the leaves but more attention was attracted to the injury to fruit caused by the young caterpillars. The attack was usually upon the cheek of an apple or pear, the skin only being eaten in some cases though usually a cavity of considerable depth was made.

**Spraying not  
immediately  
effective.**

Attempts were made to control the caterpillars by spraying with poison in bordeaux mixture, but the damage appeared to increase for as much as a week after the application of poison had been made. Injury was also quite common

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\* This is a brief review of Bulletin No. 312 of this Station, on The Tussock Moth in Orchards, by W. J. Schoene. Anyone specially interested in the detailed account of the investigations will be furnished, on application with a copy of the original bulletin. Names of those who so request will be placed on the Station mailing list to receive future bulletins, popular or complete as desired.

in orchards that had previously been sprayed for codling moth. These facts led many orchardists to believe the tussock-moth caterpillars immune to poison. However, the failure to kill them is not due to any peculiar resistance to poison; but to the fact that the insects feed, after the first, within the apple and on the lower sides of leaves in the interior of the trees where only most thorough spraying will reach them. As long as the caterpillars continued to feed in the protected spots they escaped death; but as they changed feeding grounds with their increasing size they took the poison and gradually died off.

The extent of the injury varied greatly with individual trees, ranging from wounds on possibly 5 per ct. of the fruits to partial or almost complete destruction of 85 per ct. This variation is quite readily explained by the wingless condition of the female moth and the consequent limitation of broods in successive years to rather narrow limits.

**The  
life  
stages.**

The caterpillars, especially in the last two or three of their four or five molts, are strikingly marked and, if we could forget their association with crop destruction, even beautiful caterpillars. The heads and two small tubercles on the back are bright red, a long horn-like pencil of black hairs projects forward from each side of the head and a similar pencil back and upward from the rear of the body, four very prominent brush-like tufts of thickly crowded white hairs are borne upon the back, in line, behind the head, while the remainder of the back is decorated with a broad, velvety deep black stripe.

These caterpillars are hatched in late May from eggs laid the preceding summer in conspicuous masses on the cocoons from which the mature females have emerged. From 100 to 500 eggs make up each mass, held together by a white foam-like substance which makes the mass quite conspicuous. Collection and destruction of these masses is one of the most effective methods of checking the increase of the insect.

The caterpillars are very small and inconspicuous at first and feed in protected places, on the undersides of the leaves and on interior leaves, as already mentioned, so they may long escape



1



5



2



3



4

SOME LIFE STAGES OF THE TUSSOCK MOTH.

1, Mature Male; 2 and 5, Parasitized Cocoons; 3 and 4, Adult Females, Egg Masses and Cocoons.

attention though present in considerable numbers. The females molt four times and the males five, and in from twenty-five to thirty or more days spin very thin cocoons, from which the perfect insects emerge in ten to fifteen days.

The male moth is rather attractive, with prominent feather-like antennae, or "feelers," large legs and large, broad wings, brown in color with delicate gray markings. The female is a wingless, whitish-gray grub-like insect with a sack-like abdomen. The legs and antennae are slender, quite unlike those of the male.

**Natural  
repressive  
agents.**

Natural enemies usually keep the tussock moth in check. Many kinds of birds feed upon both caterpillars and mature females and have usually held the insect to normal numbers except in cities where destruction of birds and unfavorable conditions for them have left the insects to increase unhindered except by parasitic foes. Fortunately there are several of these, the most effective being two species of wasp-like flies. Flies of other species are found less frequently. The vast debt fruit growers owe to such parasitic friends is shown by the fact that in some localities where the caterpillars have done much damage 95 per ct. of the cocoons examined were found to contain eggs of some other insect which would ultimately destroy the host. If the cocoons are collected, which is one repressive measure, they should not be destroyed, which would also kill the helpful parasites, but should be placed in a box or barrel covered with wire netting through which the moths can not escape but the parasites can.

**Man's  
modes  
of repression.**

The tussock moth spreads largely by migration of the caterpillars, so that banding unaffected trees is an admirable preventive measure. Sticky fly paper may be used for this purpose, or a band of raw cotton tightly fastened about the tree by a string at the middle of the band leaving the cotton loose both above and below the string. The loose fibres thus entangle and stop the larvae. Banding may also be used even where trees have been attacked; for the caterpillars drop to the end of a thread when the tree or branch is smartly jarred. They

can then be caught in a curculio catcher or on sheets and destroyed; and the bands will prevent the coming of a new supply.

The egg masses are very conspicuous as they are usually placed on the old cocoons, and form white clusters an inch to an inch and a half long. They usually are found on the trunks and larger branches of the trees and can be easily scraped off with a hoe or similar sharp tool. They should be burned. The smaller branches should also be examined and especially any peculiar looking bunches of dry leaves; for the cocoon is frequently attached to several leaves. This work may be done any time in winter or spring before the first of May. In the southern part of the State, particularly on Long Island, a summer collection of egg masses should also be made, as the insect here has two broods a year.

But the main reliance, in orchards, should be placed on spraying with bordeaux and poison. This is a treatment which should be made anyway, for scab and codling moth; and to control the tussock moth requires only more thorough work, giving attention to the undersides of the leaves, the growing fruits and to foliage in the interior of the trees, particularly on water sprouts. In cities, on shade trees natural enemies, banding, and collecting cocoons and egg masses must be depended on by the private individual; though it may often be necessary to employ sprays. To do this effectually requires powerful machinery and experienced help, which the city may best provide.

## NOTICE TO GRAPE GROWERS.

The Station is about to publish, as Bulletin No. 315, a tabulated description of the leading varieties of grapes, with a discussion of the grape-growing districts of the State and other features of grape culture and grape breeding. This bulletin is based upon information collected in preparing "The Grapes of New York," and is designed to furnish a summary of that work for those to whom the limited edition makes it impossible to send the "Grapes". This bulletin will be ready for mailing about May 1st, 1909, and will be sent free **on request**; but will not be regularly distributed since it would not interest those engaged in dairying, general farming or other branches of fruit growing.