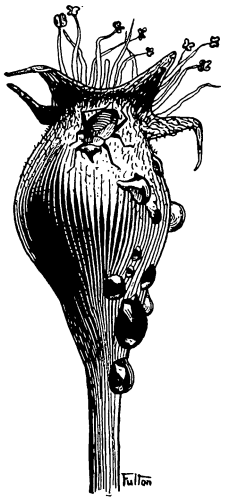
POPULAR EDITION.

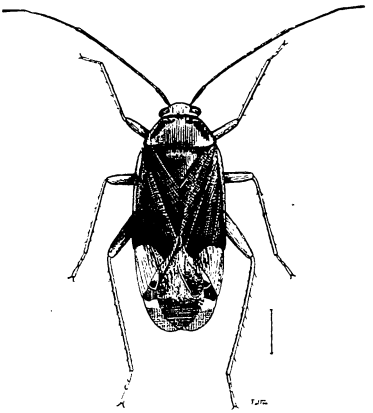
BULLETIN No. 368. NOVEMBER, 1913.

New York Agricultural Experiment Station.

GENEVA, N. Y.



YOUNG PEAR WITH SAP EXUDING FROM PUNCTURES.



FALSE TARNISHED PLANT-BUG: ADULT.

A PEAR-DEFORMING PLANT-BUG.

SUMMARIZED BY

F. H. HALL

FROM BULLETIN BY

P. J. PARROTT AND H. E. HODGKISS.

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‡Riverhead, N. Y. § Connected with Grape Culture Investigations. **Connected with Hop Culture Investigations; absent on leave.

POPULAR EDITION *

OF

BULLETIN No. 368.

A PEAR-DEFORMING PLANT-BUG

F. H. HALL.

What deforms pears?

Several insects may attack pear fruits in such a way as to deform them. Curculios may pierce them in laying their eggs, casebearers may chew minute holes through the skin, or green fruitworms may destroy considerable areas of both skin and flesh — each species causing an easily recognizable deformity of the fruit. The recent abundance of dropped or deformed pears in many western New York pear orchards, however, is due to a comparatively unknown small insect, the false tarnished plant-bug.

Work of plant-bug.

These little pests, about an eighth of an inch long in their most destructive stages, pierce the tender pear stems and the young pears before they are a half inch in diameter, suck out the juices, and cause the fruits to drop if the punctures are early or numerous, or deform the injured pears if they still remain on the trees. The injury is a characteristic one — quite different from those produced by other insects. From the minute orifices left by the punctures drops of sap first exude and may hang for some time, but when these disappear the work of the insects shows as small blackish spots or points. As the pears grow, the outer layer of the skin about these spots becomes ruptured, and a light-yellow, mealy-appearing growth of the inner layers of the skin protrudes, making a more or less triangular, granular spot; or when two or more spots run together a patch or crack lined and bordered with corky tissue. The yellowish, protruding growth at first makes a marked contrast with the smooth green skin of the little pear; and later the cessation of growth at these points causes depressions and marked general deformity of the fruit. In the flesh beneath, also, hard, gritty granulations are produced, through which it is difficult to cut with a knife.

The insect and its history.

The insect causing this trouble is a species very closely allied to the common tarnished plant-bug, so abundant during hot, dry summers on weeds and succulent plants about the farm and garden, where it often does considerable harm by checking and dwarfing new growth and tender buds.

* This is a brief review of Bulletin No. 368 of this Station on The False Tarnished Plant-Bug as a Pear Pest, by P. J. Parrott and H. E. Hodgkiss.

Injury to pears, similar to, if not identical with, that common during the past half dozen years in orchards near Lockport, Fairport, Albion, and elsewhere, has been noticed occasionally since 1884, and sometimes ascribed to other insects, sometimes to the common tarnished plant-bug, and, in a few instances, to this less known species, the false tarnished plant-bug, *Lygus invitus*. Studies by the Station entomologists, beginning in 1908, seem to prove quite conclusively that the false tarnished plant-bug is the guilty insect, since it is usually the most common species present in orchards where injury of this kind is severe; the tiny insects have been watched in the open at their pear-puncturing work; and in observation cages where they were the only insects present, the fruits have developed the characteristic injury.

Study of the little pests has been very difficult, however, and their whole life history has not yet been traced. They are very shy and very active in the orchards, disappearing from sight at the first alarm, and in the breeding cages they are very sensitive, living only a comparatively short time, though provided with an ample supply of their food plants.

The original host of this species is supposed to be the wild grape since the insects are frequently found on these plants and have been reported as feeding on the blossom clusters and young fruits of cultivated grapes, where they sometimes do considerable harm. They are also said to feed on peach and have been found to attack the young fruits in the observation cages, though not found by Station investigators on peaches in the open, in the Station orchards or elsewhere.

They appear upon the pear, as tiny nymphs of the first stage, at blossoming time, and during the first two of their five immature forms they feed mostly on the tender, unfolding leaves. They are then very active, yellowish or light green, " spidery " little creatures, moving repeatedly from one spot to another and puncturing the tissues of leaves at many places. The injured leaves later become quite ragged through the dropping out of areas about the punctures. In the last three stages the nymphs feed more largely on the young pears and their stems and move about somewhat less freely. A favorite place seems to be in the sheltered areas within the pear cluster while the little fruits are still upright and close together. In their later stages the nymphs become somewhat darker and develop " wing-pads," so that when they change to adults they are yellowish brown or dark brown in color and have two pairs of wings, the outer pair thickened at the base to serve as wing covers.

It takes a month or more for the insects to pass through the five " nymphal instars " or immature stages, so they are found on the pear trees in one of these forms through May and the first week or ten days in June, while the adults remain about a month longer in the orchards but finally disappear during late July.

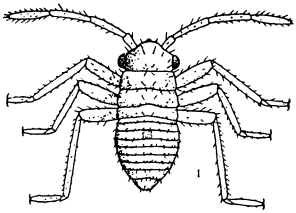

FIG. 2.—FIRST STAGE NYMPH.

FIG. 1.—EGG.

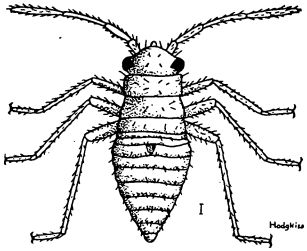

FIG. 3.—SECOND STAGE NYMPH.

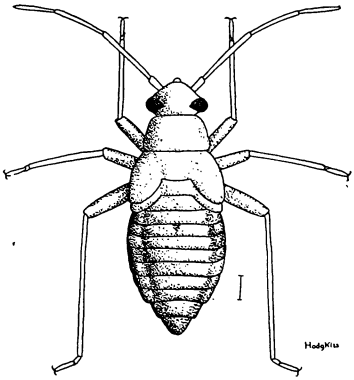

FIG. 5.—FOURTH STAGE NYMPH.

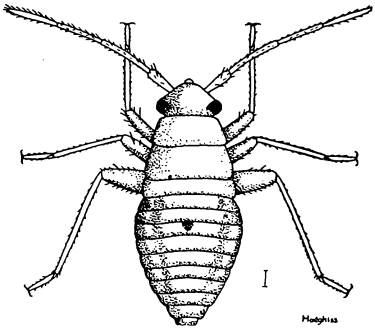

FIG. 4.—THIRD STAGE NYMPH.

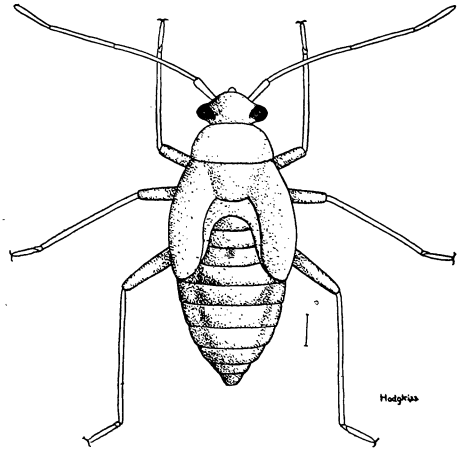

FIG. 6.—FIFTH STAGE NYMPH.

PLATE I.—EGG AND NYMPHAL STAGES OF FALSE TARNISHED PLANT-BUG

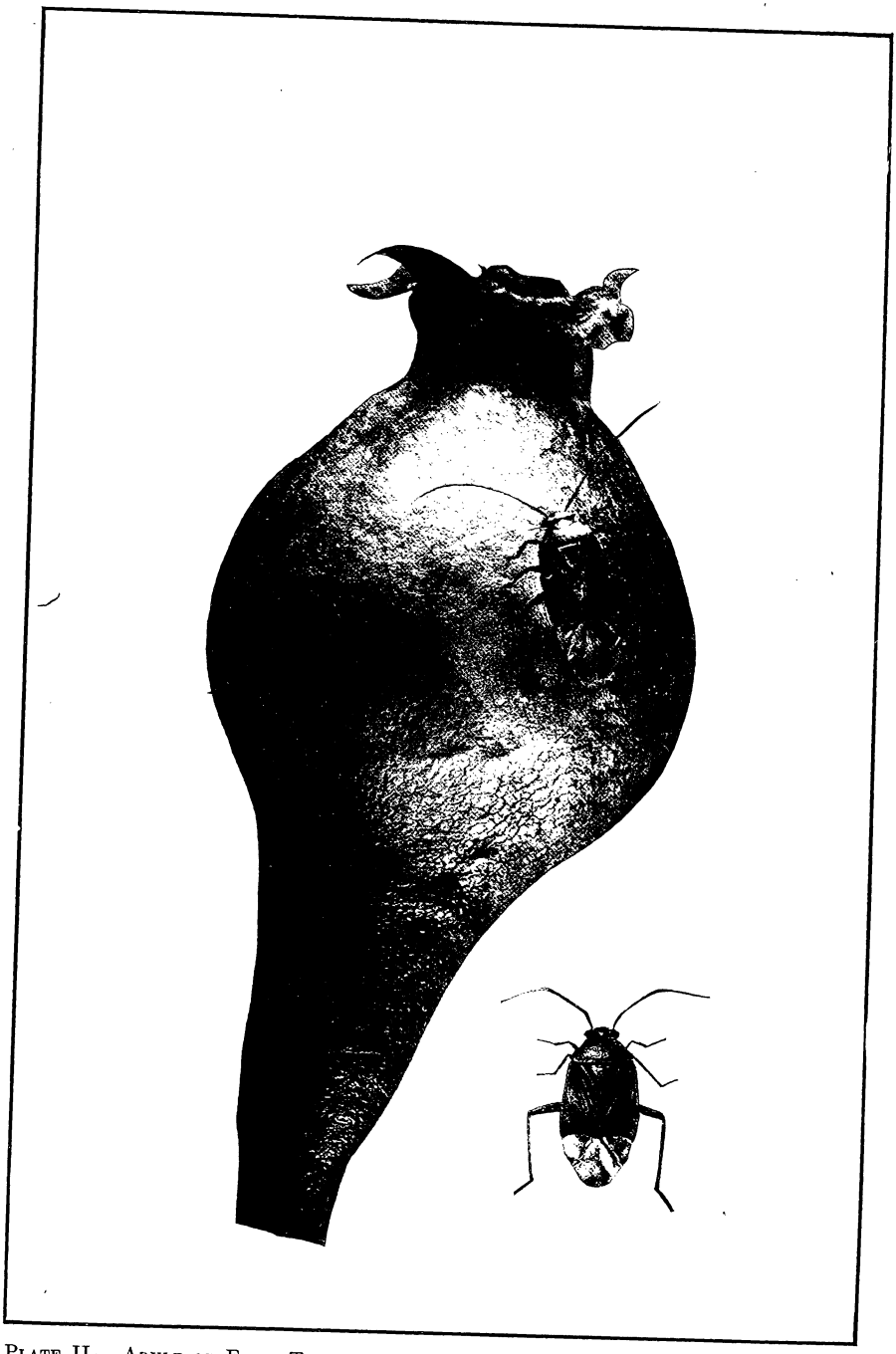

PLATE II.— ADULT OF FALSE TARNISHED PLANT-BUG ON PEAR; OF TARNISHED PLANT-BUG, BELOW.

Damage and its prevention.

The false tarnished plant-bug seems to be widely distributed in western New York but it is only in scattered orchards that it does much harm. Where thoroughly established, though, it is a serious pest. In one large pear plantation near Lockport in 1908 it was estimated that only one pear in four escaped attack, and that 75 per ct. of those attacked would prove unmarketable at maturity. The worst injured young pears were picked off as soon as possible after the attack of the insects had ended, in which thinning it was estimated that the harvest was reduced at least 500 bushels. Several other orchards suffered similarly, though less severely. All the leading commercial varieties of pears are attacked; some sorts that have been injured severely in the same or different orchards being Bartlett, Angouleme, Clairgeau, Seckel and Kieffer.

It is believed that in some cases the attack has come from insects feeding and breeding in bushy woodlands adjoining the orchards, or from weedy and shrubby roadsides, ditches and fences; but in at least one case where the injury has been very severe the orchard and its surroundings are very well kept and free from rubbish of any kind. It is probable that when the insect becomes well established in an orchard it can maintain itself there, no matter how clean the cultivation; but when the invasion is only slight, cleaning up waste land, weedy spots, growths of wild grape and sumac along borders or ditches and the maintenance of clean culture will aid in controlling the pest and may get rid of it.

The main protective resource, however, must be spraying. The grower who has any fear of attack by this insect should examine his trees carefully, commencing with the dropping of the petals, and if the young nymphs are found should spray immediately. Ordinarily, one application, made just after the blossoming period, should control the bugs efficiently. Treatment should not be delayed until injuries commence to show on the young fruits. In the Station's spraying tests, tobacco extract (40 per ct. nicotine (Black Leaf 40), using three-fourths of a pint of the extract to one hundred gallons of water to which are added three pounds of soap) has given the most satisfactory results of the various mixtures which have been tried. In applying the spray the trees should be drenched, special pains being taken to wet both surfaces of the leaves. Some growers have combined the nicotine extract with dilute lime-sulphur containing arsenate of lead as applied for codling moth with equally satisfactory results on both insects and foliage and by this means avoided the necessity of an extra spraying. But as there is danger of burning pear foliage by drenching the trees with lime-sulphur, we would advise, as a general recommendation, a special treatment with nicotine and soap to combat this pest.

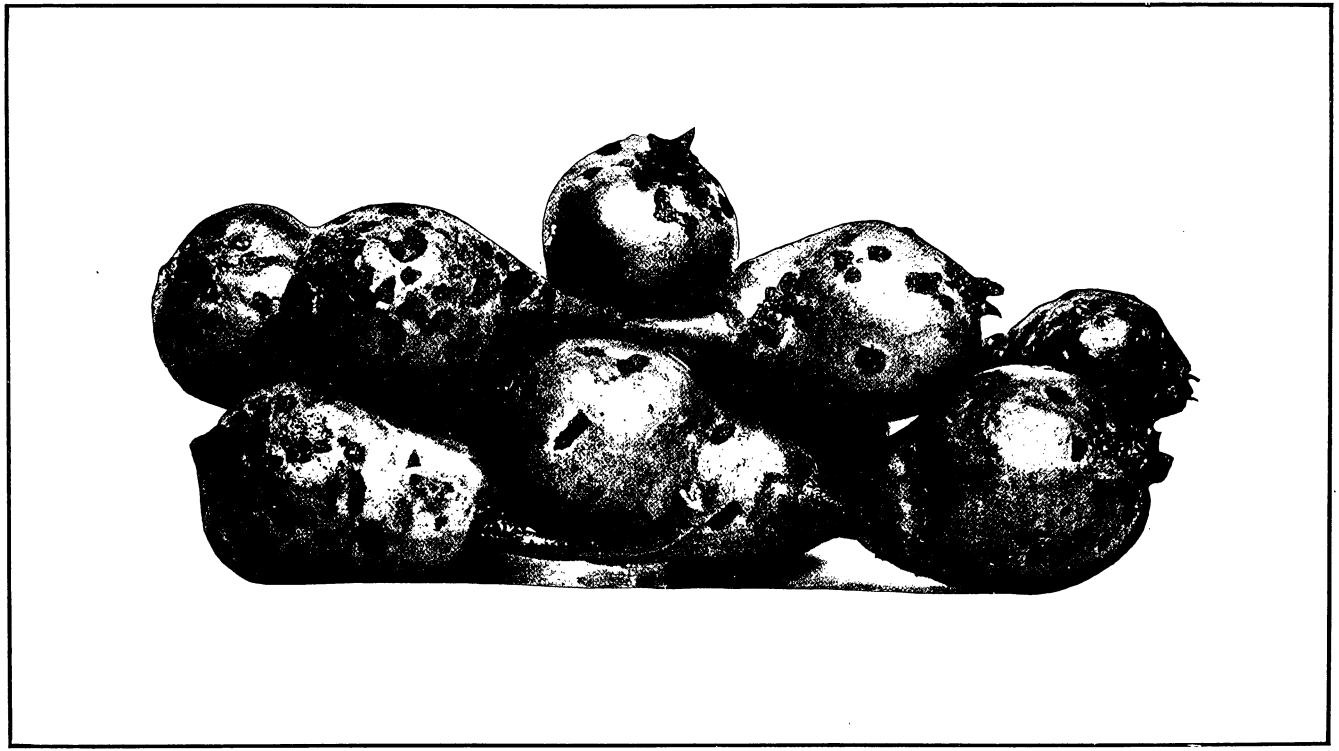

PLATE III.— COLLECTION OF FRUITS INJURED BY FALSE TARNISHED PLANT-BUG.