INSECTS IN SOIL

During the past year, several shipments of plants arrived containing soil about the roots in violation of Quarantine 37 which provides that such plants shall be "free from sand, soil, or earth." Four such shipments were found to contain injurious insects. Larvae of a species of Agriotes were contained in soil surrounding the roots of a Sunstar rose from Ireland, and what appears to be an injurious curculionid larva was found in soil around a Japanese iris from France and soil around Stilbe roots from Holland. Evergreen shrubs from Holland were found to contain the European Earwig (*Forficula auricularia* L.), and herbaceous ornamental plants from the same country contained in the soil surrounding the roots, *Otiorhyncus sulcatus* Fab.

Perhaps the most important soil interception was the finding of *Leucotermes tenuis* Hagen in soil around plants arriving from Brazil. This termite is considered the most destructive species in the world, and has been found in Santo Domingo, the Bahama Islands and Brazil. It is reported that this termite was introduced into the island of Saint Helena and was so destructive at Jamestown, the capitol, that new buildings had to be erected.

THE EUROPEAN RED MITE (*Paratetranychus pilosus* Can. & Fanz.) IN CONNECTICUT

By PHILIP GARMAN, Ph.D.

A mite which seems to be *P. pilosus* Can. & Fanz. appeared last summer in destructive numbers in Connecticut orchards. It was noticed on leaves brought from the field at Milford April 25, by M. P. Zappe, but the first signs of injury were noted by Doctor Britton at Milford about July 2. At this time several trees in an orchard showed a premature rusty appearance, and the leaves were found to be inhabited by many mites. Later a much larger orchard was reported to be infested, and during the summer it was found in four additional localities.

DIFFERENCE FROM OTHER ECONOMIC SPECIES

As the name above suggests, the mite is usually red in color, thus contrasting with the ordinary *T. bimaculatus* which is more often greenish or yellowish. The setae of the dorsum are large, arise from tuber-

cles and are pilose. The egg is usually more or less flattened above and striate, being thus different from the glistening spherical egg of *T. bimaculatus*. There may also be seen a short erect column arising from the upper surface which is usually about equal in length to the diameter of the egg. The tarsi are provided with long hook-like claws, which are lacking in *bimaculatus*. Other microscopical features are also shown in Fig. 7, 1-10.

The mite is still more unlike the clover mite, *Bryobia pratensis*, since the latter is much larger, dark bluish or purple in color when adult and is provided with a number of plates around the margin of the body. The egg of the clover mite is also larger than the red mite, being .19 mm. in diameter instead of .15; and does not possess the central stalk.

OCCURRENCE IN CONNECTICUT AND ELSEWHERE

This is the first record of the appearance of the mite in Connecticut but it was noticed in Pennsylvania in 1919,¹ by Caesar² in Ontario in 1915, and has been studied extensively in Sweden by Trägårdh³ in 1915. It was originally described from Italy in 1877-8 and probably has a much wider distribution than indicated here.

In Connecticut it has been found in New Haven, North Haven, Branford, Milford, Meriden, Middletown, Greenwich and Danbury.

COMMON NAMES USED FOR THE MITE

Trägårdh calls it the fruit-tree spinning mite, Caesar the European plum mite, while in Italy it is known as the rose mite. The name used in this paper is merely a descriptive title and should not be followed unless passed upon by the nomenclature committee of this society.

NATURE OF INJURY TO HOST

Thus far it has been taken in Connecticut on apple, cherry and rose, but has not been collected from plum. On apple the most noticeable effect of the infestation is a browning of the foliage, but some trees assume a dull leaden appearance. Late in summer the trees lose a good many leaves, and the size of the fruit appears to be affected. Thus

¹Journ. Ec. Ent., 12: 407-8: 1919.

²Can. Ent., xlvii: 57-58: 1915.

³Rev. Appl. Ent., IIIA: 254: 1915 (Abstract).

in several selected Baldwin trees, 19-24% of the fruit was $2\frac{1}{4}$ inches in diameter (the remaining 76-81% being smaller) while in uninjured trees of the same age in the same neighborhood, 44-60% of the fruit attained this size. One tree observed the latter part of September had hardly any fruit fit to sell.

Figure 7. Structures of European red mite *Paratetranychus pilosus* Can. and Fanz. and common red spider *Tetranychus bimaculatus* Harvey.

1. *Paratetranychus pilosus*, seta of dorsum 846 times enlarged; 2, egg, 14 times enlarged; 3, collar trachea and mandibular plate, 714 times enlarged; 4, tarsus of first pair of legs of female, 921 times enlarged; 5, penis, 1400 times enlarged.

6. *Tetranychus bimaculatus*, seta of dorsum, 846 times enlarged; 7, egg, 14 times enlarged; 8, collar trachea and mandibular plate, 714 times enlarged; 9, tarsus of first pair of legs of female, 921 times enlarged; 10, penis, 1400 times enlarged.

Baldwins are more easily injured than other varieties, but some browning was noted on McIntosh, Hurlburt and Ben Davis. Greening is resistant and although infested did not show the effects of the infestation.

HOW LONG HAS IT BEEN IN CONNECTICUT?

In order to become so widely distributed, the pest must have been present in the State for some time. Mites reared from eggs obtained in 1919 appear to be the same species as those obtained later. In looking over our slide collection, a single slide was found containing mites from apple leaves, collected by Mr. Zappe at Clintonville, a point near

New Haven. This slide, made in 1917, contains the same species. It has therefore been present in the State for three years and possibly longer.

MEANS OF DISPERSAL

Apples examined in the field frequently showed an abundance of small red eggs placed well within the calyx cavity. Probably they are thus carried from place to place on the fruit, and under favorable circumstances may hatch and regain a host. There is also considerable local distribution by winds.

POSSIBILITIES OF CONTROL

Our limited experience in controlling this mite under Connecticut conditions indicates that possibly the commercial lime sulphur (1-9¹) applied as a late dormant spray may prove effective. Certainly none of the summer treatments applied July 28, in one orchard where four different combinations were used, gave results that would warrant such treatment by the grower. In this laboratory, laundry soap, 4 lbs. in 50 gals. of water, killed nearly all of the mites with which it came in contact; but before we understand how to control this pest much more work must be done, especially in the line of field tests and observations under local conditions.

Blister Beetle Injury to Peaches. Blister beetles, identified as *Pomphopoea aenea* Say, caused considerable injury in a peach orchard at Marshallville, Georgia on March 10th. The trees were in full bloom on that date and the beetles attacked the blossoms, eating through the calyx and then devouring the pistil. Very often the young foliage just putting out was eaten. An army of these beetles had destroyed all blossoms on about fifty trees in a 4000-tree orchard before they were observed. Hand picking was advised immediately and with the assistance of an application of arsenate of lead, and early morning jarring the outbreak was checked within twelve hours.

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¹Since writing the above it has been found that miscible oils like scalecide are very effective ovicides.