SOME NOTES ON THE CITRUS ROOT WEEVIL

D. O. WOLFENBARGER
Sub-Tropical Experiment Station, Homestead, Florida

Extensive root injuries were found during a tree replacement program in a commercial Tahiti lime grove. Many burrows and excavations in the roots appeared to be wounds caused by insect feeding. Further observations disclosed larvae, pupae, and tender adults of the citrus root weevil, *Pachnaeus litus* (Germar), in the soil about the tree roots. Four larvae, three pupae, and two immature adult forms were taken from the soil among the roots of one tree. Much root injury was also observed on this tree. Examinations of roots from orange and lime trees in other groves indicated that such root injuries were very common.

Adults were numerous in one orange grove and were feeding on the fruit and bloom so abundantly that an important portion of the fruit was destroyed. Commercial grove caretakers reported that the citrus root weevil was worse than they had ever observed. In view of the damage caused by this insect, a study was made of the literature pertaining to it. In addition, a reconsideration of the importance of the species appeared necessary. Much of the information presented here was gleaned from the literature as indicated.

Beetles collected from near Cayamas, Cuba, in 1824 were named *Cyphus litus* by Germar in 1825, according to Schwarz and Barber (1922). Horn placed the species in the genus *Pachnaeus*, according to Schwarz and Barber (1922), but confused *litus* and *opalus*. The synonym of *litus*, therefore, is *opalus*. *P. opalus* (Olivier) was accepted as a valid species by Schwarz and Barber (1922), with *P. distans* Horn as a synonym.

REFERENCES.—*Pachnaeus litus* (Germar) is known as the citrus root weevil in the United States and as the picudo verde-azul in Cuba and Puerto Rico. *P. litus* ranges from south Florida through the Keys, Cuba, and Jamaica and, according to Wolcott (1933), is a widespread pest in the West Indies. It was listed as a pest of economic importance in Florida by Mozzette (1923) and by Watson (1918, 1939). It was reported a citrus pest by Gowdey (1923) in Jamaica. More reports concerning the species have come from Cuba, however, than from other

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areas. They are listed as follows: Bruner (1934, 1935), Bruner et al (1945), Bruner and Scaramuzza (1936), Cook and Horne (1908), Perdomo (1940), and de Zayas (1947).

Citrus plants appear to be the principal hosts of the citrus root weevil. Beans (Bruner (1935)), strawberries (Watson (1939)), and tobacco (Bruner and Scaramuzza (1936)), were also reported infested. The weevil has been observed feeding on avocado leaves. Beetles are taken occasionally from trees in a large avocado grove during a sampling procedure for the Heilipus squamosus beetle. Although beetles were observed to feed on fruit of the orange and grapefruit, none has been observed to feed on lime fruit; neither has any feeding wound been observed on lime fruit. Although Watson (1918) recognized the importance of the adults, he believed the larvae were more injurious.

Many life history details were reported by Cook and Horne (1908) and Bruner (1934). From their reports the life history is given very briefly as follows: Mature beetles begin emerging in April, reach a peak of abundance in May, become fewer during mid-summer, and by December have disappeared. Eggs are laid in groups, between two leaves or between a fold of the same leaf, and hatch in about a week. Newly hatched larvae drop to the ground, burrow beneath the surface, and begin feeding on the roots. Feeding seems to be superficial on the larger roots, but deeper wounds on the smaller roots and absence of certain small roots, suggest that entire roots are occasionally consumed. About ten months appear to be spent by the larvae in the soil.

Populations of the beetles vary extremely from year to year. Authors' writings emphasize this as a characteristic of the species. Explanations for it, however, were not found.

Watson (1918) early recommended lead arsenate for control of the beetle. He later (1932) recommended a fluosilicate. Bruner (1934) and de Zayas (1947) recommended collection of beetles. This is easily accomplished by jarring the trees. The beetles feign death in response to the jarring and fall to the canvas or other material on the ground used for the collection. Bruner (1934) believed the adult stage offered the best opportunity for combating the pest.

**Experimental Control.**—A test was conducted in the spring of 1951 to study control of beetles feeding in an orange grove. About one-half of the trees were sprayed with cryolite, the trees
in two rows were left unsprayed, and the remainder were sprayed with parathion. The sprays were applied with a power sprayer. Cryolite (synthetic) was used at six pounds per 100 gallons of water and parathion (15 percent wettable powder) was used at one pound per 100 gallons of water. Beetle populations were determined one and three days after the treatments. This was done by shaking the beetles from each of five trees onto a parachute silk spread under the trees. Five trees of each treatment were shaken and the collections of beetles were recorded for each day's count. A tabular presentation of the data, giving the average number of beetles per tree, is given as follows:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>One day</th>
<th>Three days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cryolite</td>
<td>5.6</td>
<td>3.8</td>
</tr>
<tr>
<td>Parathion</td>
<td>5.8</td>
<td>5.4</td>
</tr>
<tr>
<td>Check</td>
<td>7.6</td>
<td>8.2</td>
</tr>
</tbody>
</table>

Cryolite gave slightly more reduction than parathion. The differences between treatments are just short of statistical significance. Observations a week after treatment showed that the spray treatments had not given satisfactory beetle reductions. Improved control is needed to provide more satisfactory protection from the citrus root weevil.

**LITERATURE CITED**


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