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## Attempts at Controlling the Greenbug by the Importation and Release of Lady Beetles in Oklahoma<sup>1</sup>

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Early in 1951 it became evident that there was going to be a serious widespread infestation of the greenbug, *Toxoptera graminum* (Rond.) in Oklahoma's wheat crop. The enormous damage caused by this pest the before was altogether too fresh in the minds of farmers. Spraying parathion in 1950 had been very successful, but because of the

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serious drought in the spring of 1951, it was believed by many that the increase in yield by chemical means would not pay for the cost of the treatment. Then, too, the extremely poisonous nature of parathion deterred many from its use. And, as always, the possibility of a cure-all such as "bug-eat-bug" was very appealing.

As a result, a small group of farmers decided to import and release lady beetles, the idea being that these beneficial insects would immediately start to feed on the greenbugs and would destroy so many that heavily infested wheat fields would recover. The wide publicity given to the first shipment caused many other farmers to decide on this method of control, and in a short time, the originators of the idea found themselves in the business of importing and selling lady beetles for greenbug control in a big way. The beetles were collected while hibernating in massed colonies in the mountains of Arizona. They were sacked—one gallon to a sack—flown to Amarillo, Texas, and trucked from there to Oklahoma.

The species proved to be *Hippodamia convergens* Guer., a very common predator of aphids in Oklahoma. Also, so far as could be determined, it was the only species used.

A review of the literature revealed that this method of control had been tried in California on several crops, and a report dated in 1924 (1) stated that the method was of little value. The method was attempted again in Washington on fruits from 1943-46 (2), despite the fact that it was shown to be unjustified twenty years previously.

#### FIELD OBSERVATIONS

Four gallons, or an estimated 240,000 adults, were released on March 15 and 16 in a 40-acre wheat field near Altus, Oklahoma. This field was in very poor condition and was being severely injured by both brown wheat mites and greenbugs. The beetles had been packed in excelsior, and as it was cool they made no attempt to fly when they were released. It was subsequently noted that more larvae of the lady beetle were found near the release points than in other parts of the field. However, other fields where the beetles had been released were examined afterward, and very few were found. This was due in part to the very poor condition of the wheat and resultant reduction of the greenbug population. In one case, more lady beetles were found in the wheat field just across a road than in the field where the beetles had been released.

Ten counting stations were scattered throughout the Altus field. Each station consisted of one linear foot of row. Weekly counts were then made to determine whether or not biological control was being obtained. There was a marked increase in the greenbug population the first week and a slight reduction the second week. The next counts showed a further decrease in the greenbug population. On the other hand, brown mites continued to damage the wheat and drought persisted. It is believed greenbugs left the field because of poor food conditions. Very few lady beetle larvae and pupae were found. A small wheat field nearby, which was planted later, was severely damaged by greenbugs. It was found that lady beetle larvae were very numerous, but had not prevented severe damage to the wheat in this field. Just across the field were about 40 acres of spinach which was very heavily infested with aphids. There were great numbers of lady beetle larvae in this field, but they had failed to prevent serious infestation of the spinach with aphids.

#### LABORATORY TESTS

Adults and larvae of the lady beetle were confined in small cages with lettuce plants heavily infested with 4-day old greenbugs. At temperatures of 71° to 80° F. the beetles ate an average of approximately 20 greenbugs per day and the larvae 20 per day. At 50° F., the normal outdoor temper-

ture at that time, the corresponding figures were 20 to 15 per day. Final results showed that the daily consumption ranged from 13 to 33 greenbugs per day, depending upon temperatures and concentration of greenbugs.

#### CONCLUSIONS

The lady beetle, *Hippodamia convergens*, is not effective control for the greenbug, *Toxoptera graminum* in Oklahoma. At the low temperatures which occur when greenbugs are most numerous, these beetles do not consume as many aphids as they do later in the season at higher temperatures. Since this species occurs abundantly in the State there is some question about the advisability of importing the beetles. At an average rate of consumption at favorable temperatures, it would require one lady beetle per linear foot of row (or approximately one gallon of beetles per acre) to prevent greenbug increase in a moderately infested field. Since the cost of lady beetles in Oklahoma in 1951 was from \$15 to \$20 per gallon, it would be much greater than the cost of control with parathion spray. Another important reason for the lack of success is the dispersal habits of these beetles. Comparatively few remain in the fields where they are liberated. They do not attack and feed on brown mites which may also infest the wheat along with greenbugs.

#### LITERATURE CITED

1. DAVIDSON, W. M. 1924. Observations and experiments on the dispersion of the convergent lady beetle (*Hippodamia convergens* Guerin) in California. Trans. Am. Ent. Soc. 50: 163-175.
  2. HATCH, M. H. and C. TANASKE. 1948. The liberation of *Hippodamia convergens* in the Yakima Valley of Washington, 1943 to 1946. Journ. Econ. Ent. 11(6): 993.
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