



Keeping
Up With
Research

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Pale Western Cutworm Control on Wheat

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The pale western cutworm (*Agrotis orthogonia* Morr.) is a pest of considerable importance on wheat and other cereal crops throughout most of the Great Plains region of the United States. It was virtually unknown before 1911 and apparently did not become a pest until the cultivation of range lands and the growing of grain crops became widespread in the prairies. In Kansas, a severe outbreak developed in 1936 and since that time outbreaks have occurred at various intervals. It is a sporadic pest that occurs in large numbers when conditions are favorable.

Generally, pale western cutworm infestations are limited to the extreme western tier of counties in Kansas. It is a typical dryland cutworm, preferring semi-arid areas. All larval stages are subterranean in habit, feeding on the plant below the soil surface. As cutworms mature, they move along drill rows, cutting off tillers at or just above the crown. The greatest amount of damage occurs from April through June. Even when total damage is comparatively slight on a state-wide basis, the pale western cutworm may be highly important to an individual grower whose crops are threatened.

The pale western cutworm is a univoltine species, having but one generation annually. Eggs are deposited in the soil during late September and early Octo-

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ber. They hatch the following spring (February) and reach their full growth in late May and early June. At this time they form earthen cells, shrivel up and remain dormant for the summer. In early August they transform into the pupal stage and emerge as adult moths in late September or early October. After mating, females begin depositing eggs in the soil, thus completing the life cycle.

Natural enemies (predators, parasites, diseases) are known to attack cutworm larvae, but they appear to be of little value in Kansas. Consequently, growers must rely on chemical control to prevent economic crop losses. A test was conducted in western Kansas to evaluate several insecticides for pale western cutworm control on wheat.

Procedure

Four insecticides were applied to Eagle wheat in a randomized complete block design with three replications. Each plot was 33 ft. x 33 ft. (1/40 acre). Insecticides were applied May 9, 1980, at the rate of 15.5 gallons total spray per acre. Posttreatment larval counts were made 3 and 7 days following application by examining four 1-ft² samples in each plot.

Plots were harvested and yields calculated in bushels per acre.

Results

All insecticides at indicated rates (Table 1) significantly reduced cutworms at 3 days posttreatment. Plots treated with Ambush at 0.20 lb a.i./acre had the fewest cutworms, but it was not significantly better than the other insecticidal treatments. Seven days after treatment, all treated plots had significantly fewer cutworms than the untreated check. No larvae were found in plots treated with Ambush at 0.20 lb a.i./acre. The other insecticides were less effective, but not significantly so. Insecticidal treatments gave slight numerical increases in grain yields over the untreated check, but differences were not significant. Yields varied from 41.5 bu/acre for the check plot to 48.7 bu/acre for the 0.10 lb Pounce plots. Low cutworm numbers probably were influential in preventing greater yield differences. No apparent phytotoxicity was observed as a result of any of the chemical treatments.

Table 1. *Evaluation of insecticides applied to wheat for pale western cutworm control and grain yields.*

| Treatment & Formulation | Dosage (lb a.i./acre) | No. of cutworms per square foot after | | Yields (bu/acre)** |
|-------------------------|-----------------------|---------------------------------------|---------|--------------------|
| | | 3 days* | 7 days* | |
| Ambush, 2 E | 0.20 | 0.17 a | 0.00 a | 46.0 |
| Ambush, 2 E | 0.10 | 0.25 a | 0.17 a | 42.6 |
| Pounce, 3.2 E | 0.10 | 0.25 a | 0.17 a | 48.7 |
| Pounce, 3.2 E | 0.05 | 0.42 a | 0.33 a | 42.5 |
| Lorsban, 4 E | 0.50 | 0.50 a | 0.25 a | 43.1 |
| Endrin, 1.6 E | 0.20 | 0.58 a | 0.33 a | 43.9 |
| Untreated | 0.00 | 1.50 b | 1.58 a | 40.7 |

*Any means in the same column followed by the same small letter are not significantly different at the 5% level (Duncan's multiple range test).

**Non-significant at the 5% level.

New Controls Approved

Until recently, endrin was the only insecticide registered for pale western cutworm control. In 1983, however, the Environmental Protection Agency (EPA) granted a specific exemption under the provisions of SECTION 18 (FIFRA) for the use of permethrin (Ambush and Pounce) and chlorpyrifos (Lorsban) to control pale western cutworm on wheat in Kansas. All applicable directions, precautions and restrictions on the EPA-registered product label must be followed. The specific exemption for permethrin and chlorpyrifos use on wheat expires June 1, 1983.

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