K-STATE
Kansas State University

# FIELD 202A Y


**Southwest Research–Extension Center**

## Report of Progress
## 895

*Kansas State University*
*Agricultural Experiment Station*
*and Cooperative Extension Service*

Southwest Research-Extension Center

# EFFICACY OF REGENT AND COUNTER FOR CORN ROOTWORM AND SOUTHWESTERN CORN BORER SUPPRESSION

*by*

***Larry Buschman, Phil Sloderbeck, and John Wooden***

SUMMARY

This trial was conducted to evaluate planting time applications of Regent 4SC and Counter 20CR against corn rootworm and southwestern corn borer larvae. Both insecticides provided protection against corn rootworm injury. The Regent plots also had lower southwestern corn borer infestations, but most of the differences were not statistically significant. This suggests that the Regent treatment reduced corn rootworm damage significantly and provided some first- and second-generation southwestern corn borer suppression.

## PROCEDURES

In 2001 two trials were installed in two different fields at the Southwest Research-Extension Center near Garden City, KS. At the Finnup, field 'Pioneer 3162IR' was planted 9 May with a John Deer MaxEmerge 6 row planter, with plots 6 rows wide (total of 15 ft) and 50 ft long with 10-ft alleys. The plot design was a randomized block design with 4 replicates. Counter 20G was applied with planter mounted granular applicator boxes at 6 oz per 1000 ft. A 7-inch bander was mounted before the press-wheel to apply the insecticide in a "T-Band". Regent 4SC was mixed with water and applied at 3 gal of solution per acre at 14 psi through a micotube directed into the seed furrow. Corn rootworm damage was evaluated on 12 July by digging four corn plants from each plot and rating them using the new Iowa State 0 to 3 linear root damage scale. These ratings were then converted to the older Iowa 1 to 6 scale for comparison with data from previous evaluations.

At the Holcomb field Pioneer '31A12' was planted 12 May with a Kinze Model 3100 4-row planter. The plots were 8 rows wide (total of 20 ft) and 138 ft long with 20-ft alleys. However, only the two center rows of each 4-row pass were left untreated in the check plots. The plot design was a randomized block design with 4 replicates. Counter 20G was applied with planter mounted granular applicator boxes at 6 oz per 1000 ft. A 7-inch bander was mounted before the press-wheel to apply the insecticide in a "T-Band". Regent 80WG was mixed with water and applied at 3.3 gal of solution per acre at 14 psi through a micotube directed into the seed furrow. Up to July 11, these plots were irrigated by sub-surface drip on 20, 22, and 27 June and 2 July (0.4, 0.31, 0.12 and 1.00 inches per acre)

Corn rootworm damage was evaluated by digging four corn plants from each plot on 11 July (Holcomb) and 12 July (Finnup) and rated using the Iowa State 0 to 3 linear root damage scale. These ratings were also converted to the older Iowa 1 to 6 scale so the data can be compared with previous data.

At the Finnup trial, 10 plants in each plot were manually infested with an average of 10 SWCB neonate larvae per plant on 27 June. First generation infestation was evaluated using a modified Guthrie rating (0-9 scale) for 10 infested plants per plot on 17 July. Five infested plants per plot were then dissected on 1 August to record the 1st generation corn borer observations. Second generation SWCB infestation resulted from free flying feral moths and moths emerging from the manually infested first generation. On 18 September we dissected 10 plants per plot (not infested with 1st generation neonates) to make observations on 2nd generation corn borers. Grain yield was not determined because the plant stand was variable and the insect pressure was too light to affect yields.

## RESULTS AND DISCUSSION

Corn rootworm pressure in the untreated check averaged 0.30 and 0.25 on the Iowa State 0 – 3 scale and 3.1 and 2.7 on the Iowa 1 to 6 root damage scale for the Holcomb and Finnup locations, respectively (Table 1). Both Regent and Counter treatments had lower corn rootworm injury than the untreated check,

but when the data from the two sites were analyzed separately the difference was significant only for the Iowa 1 to 6 ratings at Holcomb (Table 1). When the two trials were combined the root ratings for the Regent and Counter treatments were significantly lower than those for the untreated check for both rating systems (Table 1).

The artificial infestation of first generation SWCB resulted in modified Guthrie ratings that averaged 6.9 on the 0 to 9 scale on infested plants in the untreated check (Table 2). There were 1.6 larvae per plant and 12.1 cm (4.8 in.) of tunneling per plant. However, there were no significant differences in 1st generation observations among the treatments. Second generation SWCB resulted in 0.23 larvae per plant and 26.0 cm (10.2 in.) of tunneling per plant in the untreated plots. Regent-treated plots had significantly lower southwestern corn borer tunneling relative to the untreated check and Counter-treated plots (Table 2).

**Table 1. Efficacy of Regent and Counter for reducing western corn rootworm damage on corn in SW Kansas, Garden City, KS, 2000.**

| | | Holcomb | | Finnup | | Combined | |
|---|---|---|---|---|---|---|---|
| Treatment | Rate | Root Rating 0-3 scale | Root Rating 1-6 scale | Root Rating 0-3 scale | Root Rating 1-6 scale | Root Rating 0-3 scale | Root Rating 1-6 scale |
| Untreated | — | 0.304 | 3.1 a | 0.245 | 2.7 | 0.275 a | 2.9 a |
| Counter 20CR | 1.3 lb ai/a | 0.094 | 2.2 b | 0.146 | 2.3 | 0.120 b | 2.2 b |
| Regent 4SC | 0.13 lb ai/a | 0.105 | 2.5 b | 0.083 | 2.2 | 0.094 b | 2.4 b |
| F-Test Prob. | | 0.1875 | 0.0364 | 0.2039 | 0.2334 | 0.0456 | 0.0095 |
| LSD value at p=0.05 | | — | 0.628 | — | — | 0.1502 | 0.4041 |

Means within a column followed by the same letter do not differ significantly (LSD, P=0.05)

**Table 2. Efficacy of Regent and Counter for controlling southwestern corn borer larvae, Garden City, KS, 2000.**

| | | First Generation SWCB | | | | Second Generation | | |
|---|---|---|---|---|---|---|---|---|
| Treatment | Rate | Modified Guthrie Rating 0-9 | SWCB Per plant | SWCB Tunnels Per plant | SWCB Tunneling Cm/plant Per plant | SWCB Per plant | SWCB Tunnels plant | SWCB Tunneling Cm/plant |
| Untreated | — | 6.9 | 1.6 | 2.0 | 12.1 | 0.23 | 0.40 | 26.0 ab |
| Counter 20CR | 1.3 lb ai/a | 6.2 | 1.2 | 1.6 | 9.5 | 0.15 | 0.40 | 32.3 a |
| Regent 4SC | 0.13 lb ai/a | 5.8 | 0.9 | 1.5 | 8.6 | 0.00 | 0.15 | 4.5 b |
| F-Test Prob. | | 0.4228 | 0.1995 | 0.4168 | 0.4461 | 0.2007 | 0.1914 | 0.0535 |
| LSD value at p=0.05 | | — | — | — | — | — | — | 22.613 |

Means within a column followed by the same letter do not differ significantly (LSD, P=0.05).

Kansas State University Agricultural Experiment Station and Cooperative Extension Service, Manhattan 66506

SRP 895 June 2002