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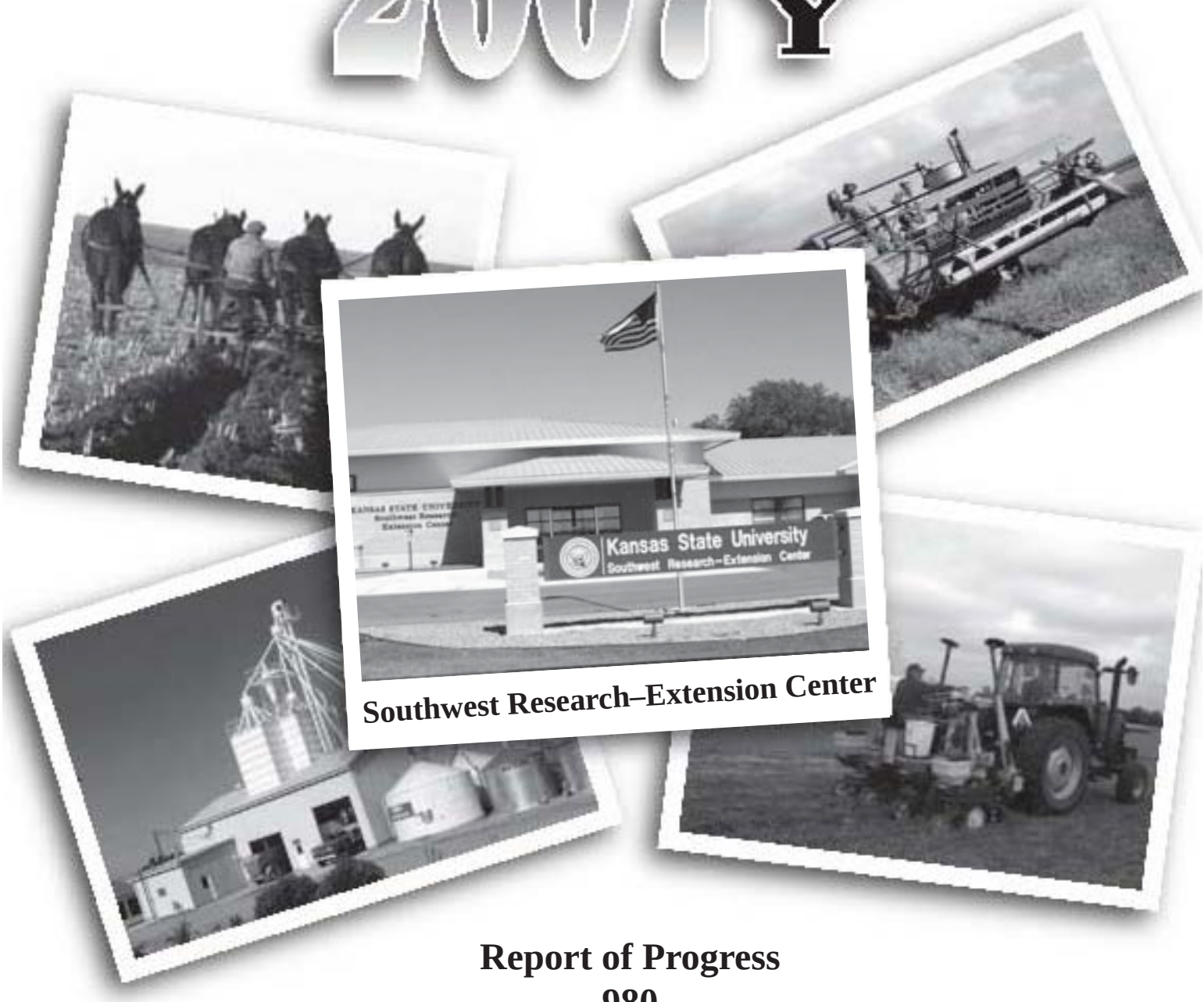

Southwest Research–Extension Center

Report of Progress 980

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

Southwest Research-Extension Center

EFFICACY OF FIPRONIL APPLIED AS A FOLIAR TREATMENT ON SIX COMMERCIAL SOYBEAN VARIETIES TO CONTROL DECTES STEM BORERS IN SOYBEAN, SCANDIA, KS, 2006

by

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SUMMARY

We tested a foliar fipronil insecticide treatment applied to six soybean varieties to determine effectiveness in reducing Dectes stem borers (Dectes texanus) in soybean. The foliar application of fipronil significantly reduced Dectes stem borer infestations between 76% and 88%. However, these treatments increased yield only 2.9%, and this was not statistically significant. Dectes stem borer infestation averaged 55% infested plants.

PROCEDURES

Seed of six commercial soybean varieties in maturity groups II through to IV was machine-planted at 16 seed per row-foot on May 17, 2005, at the irrigation experiment field near Scandia,. The plots were four rows wide and 20 feet long. There was a 3-foot-wide alley at each end of the plot. The design was a randomized block experiment with three replications. There was a treated and untreated plot of each variety in each replication. The foliar treatment of fipronil was applied July 18 during the beetle flight. This treatment targeted the first two instars developing inside the plants. The foliar treatment was applied with a backpack sprayer, using a hand-held boom with two nozzles (Conejet TXVS 6) directed at a single row. The nozzles were held 6-8 inches from the plants to maximize coverage of the upper canopy. The sprayer was calibrated to deliver 20 gal/acre (8.0 sec per 20 ft row at 30 psi). A chronometer was used to measure the time spent on each row to help maintain appropriate speed. The experiment was analyzed as a two-factor experiment with six levels of variety and two levels of treatment.

Dectes stem borer infestations were recorded at the end of the season (September 22) by dissecting five consecutive plants from each of the four rows in each plot for a total of 20 plants. The plants were dissected to record entry nodes, upper stem tunneling, tunneling that reached the base of the plant, and presence of live Dectes larvae. Grain yield data was collected by machine harvesting the plots October 12 and converted to bushels per acre based on 12% moisture.

RESULTS AND DISCUSSION

Dectes stem borer infested 55% of plants in 2006. This was similar to the infestation of 2004, when we were able to show yield responses with fipronil treatment. In this 2006 trial, the fipronil treatment significantly reduced Dectes stem borer infestations (81%, 78%, 82% and 88% for entry nodes, stem tunneling, base tunneling and live larvae, respectively; Table 1). However, the fipronil treatment only increased grain yield 2.9%, and this was not a significant increase. There were some significant differences in Dectes infestation across the different varieties, but there was no significant yield difference across the varieties. This was surprising because there was such a wide difference in maturity across the varieties. The 2006 results suggest there was no physiological yield loss associated with Dectes stem borer infestations. We were not able to show differences in tolerance of the different varieties to Dectes stem borer infestations.

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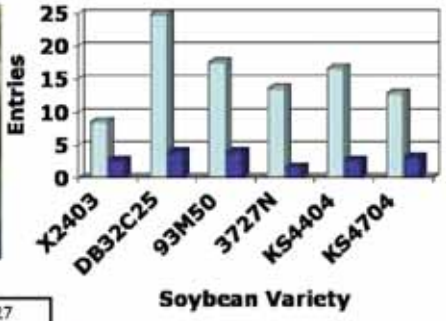
Dectes Stem Borer
Entry Nodes per 20 Plants



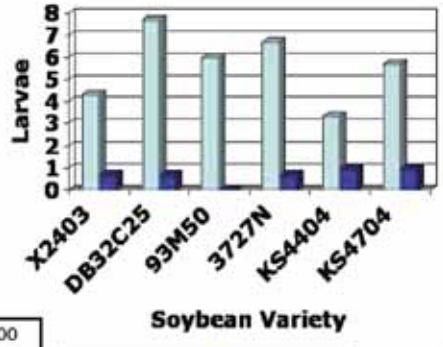
Variety P=0.0027

Treatment P=>0.0001

UnSprayed Sprayed

81% Control

Dectes Stem Borer
Larvae per 20 Plants



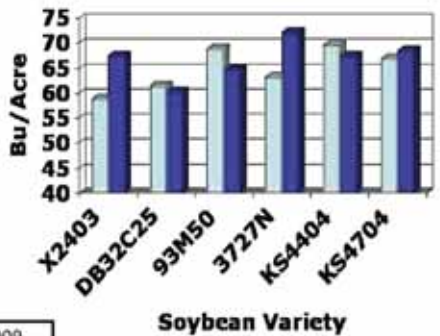
Variety P=<0.5000

Treatment P=>0.0001

UnSprayed Sprayed

88% Control

Grain Yield Bu/Acre
Sprayed and Unsprayed Soybean Varieties



Variety P= 0.3909

Treatment P=<0.5000

UnSprayed Sprayed

2.9% Increase

Table 1. F-test Probability values for the ANOVA tests of the two main effects, variety and insecticide treatment. Fipronil treatments were applied as foliar treatments. Irrigation Experiment Field, Scandia, Kansas, 2006.

	Soybean Maturity Group	Entry Nodes /20 plants	Stem Tunneling /20 plants	Base Tunneling /20 plants	Live Larvae /20 plants	Grain Yield Bu/Acre
ANOVA F-Test Probability						
Replication		**0.001**	**0.0191**	0.0669	0.0566	**0.0383**
Variety		**0.0027**	0.3505	**0.0087**	<0.5000	0.3909
Insecticide		**>0.0001**	**>0.0001**	**>0.0001**	**>0.0001**	<0.5000
V x I Interaction		**0.0175**	<0.5000	**0.0465**	<0.5000	<0.5000
Variety Means—Untreated						
Nex2403K2RR	Mid II	8.7	7.3	4.7	4.3	58.9
Dyna-GroDB32C25	Early III	25.0	12.7	2.3	7.7	61.4
Pioneer 93M50	Mid III	17.7	13.3	2.0	6.0	69.0
Ohlde 3727NRS	Late III	13.7	10.3	8.0	6.7	63.2
KS4404RR	Early IV	16.7	12.0	6.0	3.3	69.7
KS4704RR	Mid IV	13.0	9.7	5.3	5.7	66.9
Mean		15.8	10.9	4.7	5.6	64.85
Variety Means—Fipronil—Treated						
Nex2403K2RR	Mid II	2.7	2.7	1.0	0.7	67.5
Dyna-GroDB32C25	Early III	4.0	3.0	1.0	0.7	61.4
Pioneer 93M50	Mid III	4.0	3.0	0.0	0.0	69.0
Ohlde 3727NRS	Late III	1.7	1.0	1.0	0.7	63.2
KS4404RR	Early IV	2.7	2.7	1.0	1.0	69.7
KS4704RR	Mid IV	3.3	2.3	1.0	1.0	66.9
Mean		3.06	2.5	0.8	0.7	66.76

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