

Kansas Soybean Commission Annual Report of Progress
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Project Title: "Biology and Management of the Soybean Stem Borer in Kansas"

Amount of Funding: \$26,901

Progress Report: March 1, 2005 – Feb. 28, 2006

Projected Completion Date: Feb. 28, 2006

Accomplishments since last report:

Objective 1: Evaluate the efficacy of feeding and oviposition scars to detect differences in host plant resistance in soybean varieties. Soybean resistance to *Dectes* stem borers was evaluated in the greenhouse by covering the plants with a cage and introducing *Dectes* beetles. There were significant differences among the lines in the numbers of feeding scars and oviposition scars, but few surviving larvae were found when plants were dissected. We were successful in getting the beetles to emerge from soybean stubble earlier than they emerged in the field (which allows these trials to be down before the field trials), but the timing of the beetle emergence could have been better synchronized with the growth of the plants. In the field we planted 6 commercially available Kansas-adapted varieties in replicated 4 row plots at Garden City and Hutchinson. Severe hail damage and very light *Dectes* infestations caused these trials to be abandoned. At Scandia we hand-planted 6 commercial varieties and 9 accessions from the soybean germplasm plant introduction (PI) gene bank. We installed 10 X 14 ft field cages over the planted soybeans and introduced 550 *Dectes* beetles to insure the plants were heavily infested. We evaluated the plants for feeding scars, oviposition scars and live larvae. There were 4- to 11-fold differences among the entries suggesting there may be resistance. A poster summarizing this work was displayed at the 2006 Soybean Expo meeting held in Topeka.

Objective 2: Evaluate the efficacy of KSC sponsored KSU produced genetically engineered soybeans containing chitinases in reducing soybean stem borer feeding, oviposition and infestation. We were able to expose the chitinase-producing transgenic soybeans to *Dectes* stem borers in the greenhouse. Data on beetle feeding and egg scarring were inconclusive. We believe this work needs to be repeated.

Objective 3: Evaluate the efficacy of systemic insecticides on soybean stem borers when applied to plants when first-instar larvae begin feeding in the plants. The 2005 insecticide efficacy evaluation plots were established and treated with 6 soil-applied and 7 foliarly-applied systemic insecticides. The *Dectes* beetle populations were high, however, the hail-damaged plants were delayed and were only exposed to the tail end of the flight. The infestation rate only reached 25 %. Of the insecticides tested, only foliar applications and the 20 July soil application of fipronil (Regent) significantly reduced *Dectes* stem borer infestations. The late application of fipronil appeared to kill larvae after they had started tunneling in the stem. The plant stand and the insect infestation were variable because of the hail damage, so grain yields were not collected. The 2004 insecticide work was reported in the Southwest Research-Extension Center Field Day Report for 2005 and the 2005 work will be reported in the 2006 Report. This work was also featured in a Poster presented at the National Meeting of the Entomological Society of America.

Objective 4: Study the impact of stubble management practices on stem borer over-wintering success. Based on findings previously reported, work on this objective has been discontinued.

Objective 5: Expand web pages associated with soybean insect pests. We continued to develop our soybean insect web pages at: <http://www.entomology.ksu.edu/DesktopDefault.aspx?tabindex=183&tabid=403>.