KANSAS SOYBEAN COMMISSION
Investigations of the Soybean Stem Borer in Kansas

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JUSTIFICATION: The soybean stem borer has caused severe lodging problems to soybean in Kansas. Infestations have been reported since 1985 in South Central Kansas, however problems are spreading into Southwest and North Central Kansas. Growers and consultants are reporting significant harvesting problems because of lodged plants. Until this study, there was no research database on this insect in Kansas.

PROJECT OBJECTIVES:
1. Investigate the seasonal occurrence of the soybean stem borer (SBSB) in Kansas.
2. Evaluate varieties and cropping history to assess factors that may predispose fields to be heavily infested with soybean stem borer.
3. Test the efficacy of various insecticides for reducing damage from the soybean stem borer.

RESULTS: Objective 1. Data from 2001 is currently being combined with the data from 1999 and 2000 to develop a better understanding of the life cycle of the soybean stem borer under Kansas field conditions. In Republic County the beetles normally begin to appear about the 20th of June and peak adult numbers (based on sweep samples) occurred about the middle of July, but some adults were still being found in early September. In 2001, 76 percent of the beetles in the samples were collected in the three samples between July 2nd and July 16th. Leaf death peaked on August 20th when up to 49% of the plants were showing signs of premature leaf loss. Infestations at the end of the season ranged from 18 to 80 percent. This type of information will be very important in trying to pick the best time to treat for soybean stem borer adults as treatments will need to be made after a significant percentage of the adults have emerged, but before the eggs are laid in the leaf petioles. A poster based on this research was presented at the National ESA meeting in December of 2001 and is on the www at:
http://www.oznet.ksu.edu/entomology/extension/insectinfo/sbsb/esa poster 2001c.pdf

Objective 2. Data gathered in 2001 indicated that while small differences in the percent of plants infested and lodging levels could occasionally be detected among varieties, relationships among the varieties varied greatly between locations. This may be an indication that other factors such as stem diameter, plant vigor or growing conditions may influence the amount of infestation and lodging. Thus, no evidence of true resistance to the soybean stem borer appears to be present in varieties commonly grown in Kansas.

Objective 3. Insecticide bioassays were conducted on lambda-cyhalothrin (Warrior), permethrin (Pounce and Ambush) and carbaryl (Sevin). Our trials showed that lambda-cyhalothrin and permethrin were 153 and 26 fold more toxic than carbaryl, respectively. A poster with these data was presented at the North Central Branch Meeting of the ESA in March of 2002 and is on the www at:
http://www.oznet.ksu.edu/entomology/extension/insectinfo/sbsb/esancb02.pdf
In addition, a field study was conducted to evaluate the effects of lambda-cyhalothrin (Warrior) against soybean stem borer adults. Strips were treated by aerial application in three soybean fields in South Central Kansas. Significant reductions in beetle numbers were observed for 10 to 14 days after application, however even with two applications 14 days apart there was still significant SBSB infestation in the treated plots. Thus, further study is needed to determine if adult control can be used as an economically effective management option.

SIGNIFICANCE: Harvest losses from the soybean stem borer can be severe. While growers can often avoid loses through timely harvest this is not always possible. Expanding the list of management options could greatly reduce the impact of this pest. The information obtained on the seasonal history of this pest will be very useful in helping producers making management decisions regarding this pest and initial success in controlling adult beetles will encourage further research in this area. Acknowledgment of funding provided by the Kansas Soybean Commission was listed on all websites, newsletters, posters, radio interviews, and email messages highlighting Kansas stem borer research summaries, including: http://www.oznet.ksu.edu/entomology/extension/Current/soybstbr.html. More detail

on the data in this report should soon be available in a thesis being completed by Michelle Kaczmarck.