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# Effect of Bean Leaf Beetle Management on Soybean Yield and on Incidence of Bean Pod Mottle Virus in Eastern Iowa

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**Abstract**
The bean leaf beetle (BLB) is a long-time pest of soybeans and other beans; but until 2000, it seldom reached levels that warranted treatment on a large scale. Recently however, the BLB also has been identified as the transmission source of a disease called "bean pod mottle virus" (BPMV), which can cause yield reduction of benas as well as discoloring of soybeans that results in dockage at market. During the winter of 2000–2001, high overwintering BLB populations due to an extensive insulating snow cover suggested that BLB populations would be quite high during the 2001 growing season. While research by Dr. Larry Pedigo, professor of entomology, and others has been done to establish developmental stage thresholds for BLB management in soybeans, the addition of BPMV to the overall equation indicated the need for additional research to determine timing, effectiveness, and economics of spraying to prevent the introduction of BPMV into the plants.

**Keywords**
Entomology

**Disciplines**
Agricultural Science | Agriculture | Entomology

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## Introduction

The bean leaf beetle (BLB) is a long-time pest of soybeans and other beans; but until 2000, it seldom reached levels that warranted treatment on a large scale. Recently however, the BLB also has been identified as the transmission source of a disease called "bean pod mottle virus" (BPMV), which can cause yield reduction of benas as well as discoloring of soybeans that results in dockage at market. During the winter of 2000–2001, high overwintering BLB populations due to an extensive insulating snow cover suggested that BLB populations would be quite high during the 2001 growing season. While research by Dr. Larry Pedigo, professor of entomology, and others has been done to establish developmental stage thresholds for BLB management in soybeans, the addition of BPMV to the overall equation indicated the need for additional research to determine timing, effectiveness, and economics of spraying to prevent the introduction of BPMV into the plants.

## Materials and Methods

The experimental layout was a randomized complete block design with four replicates of three treatments—early season treatment, early season treatment followed by a mid-season treatment, and check. The plots were planted April 18, 2001, to Cargill B324RR at 178,000 seeds/acre, 85% germination, in 30-inch rows. On May 3, the day after BLBs were first observed in the plots, early season treatment of Warrior T at 1.92 ounces in 23 gallons of water/acre was applied. The mid-season treatment applied on July 7, also was Warrior T at 1.92 ounces in 23 gallons of water/acre. BLBs were counted in three feet of row in the center of each plot on a weekly basis beginning on May 3 and ending September 6. Leaf samples were collected on September 20 to be analyzed for the presence of BPMV. The plots were machine harvested on September 26, and samples were collected from each plot.

## Results and Discussion

Summarized in Table 1 and Figure 1 are the results of the 2001 study. Because BLBs are attracted to the earliest emerging soybeans, it was hoped that the early planting would attract large numbers of BLB to the plots. However, BLB pressure was unexpectedly low throughout the season, and there was no response of the BLB to the July 7 insecticide treatment (which should not have happened; there is no legitimate explanation for it). Figure 1 shows the average number in each treatment, throughout the season, of BLB per three feet of row.

There were no significant differences in yield among any of the treatments at the 95% level of statistical confidence. However, the difference in yield between the check and the treatment involving the early-season spray followed by the mid-season spray was significantly different at the 90% level of statistical confidence. But the difference of 3.325 bushels of soybeans would not have paid for the expense of the two applications of insecticide.

None of the samples contained discolored seeds. Results of the leaf tissue tests for BPMV were not available at the time this was written. It would be interesting to know what the yield, disease incidence, and seed discoloration results would have been had BLB populations achieved the anticipated levels.

**Acknowledgments**

We would like to thank Syngenta for the insecticide used in this study and Matt Hunt for his time and labor during planting, growing, and harvesting.

**Table 1. Effect of bean leaf beetle mamagement on soybean yield in 2001 at the Southeast Farm, Crawfordsville, Iowa.**

| Treatment | Yield |
|---|---|
| May 3 spray only | 43.750 |
| May 3 spray followed by July 7 spray | 45.900[a] |
| Check | 42.575 |
| LSD (P=0.05) | NS* |

* Differences in yield means were not statistically significant.

[a] While this treatment was not statistically better than the check at P=0.05, it was statistically better than the check at P=0.10.

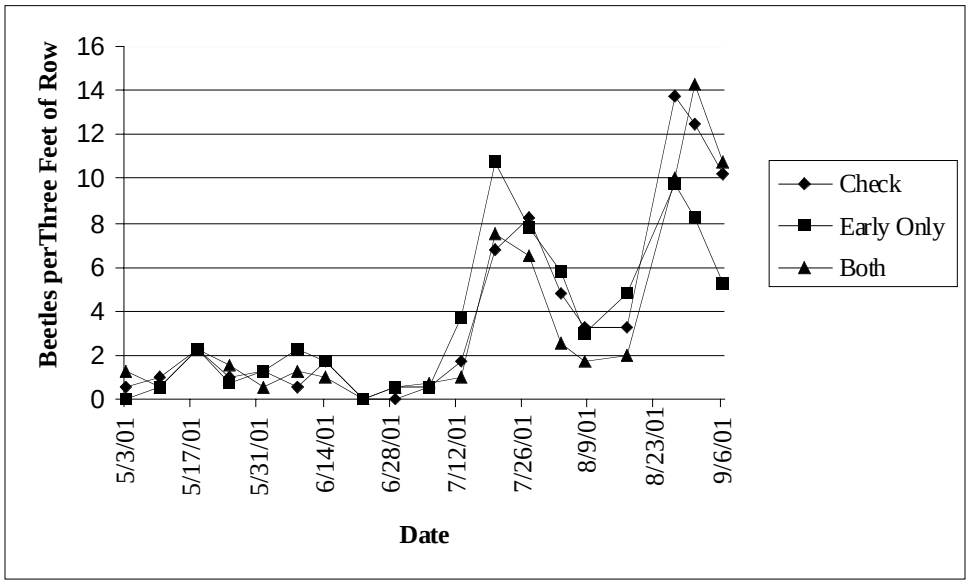


**Figure 1. Effect of bean leaf beetle management on bean leaf beetle populations in 2001 at Southeast Farm, Crawfordsville, IA.**