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Soybean Pest Control Study

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Abstract
The project was designed to study the effect of controlling insect and disease pests in soybeans. During any given crop season, there are often one or more pest problems that arise in soybean fields, potentially causing yield loss. This yield loss may be prevented by timely application of crop protectants that control pests. The study was designed to determine any yield effect caused by controlling soybean pests with the use of certain crop protectants.

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Introduction

The project was designed to study the effect of controlling insect and disease pests in soybeans. During any given crop season, there are often one or more pest problems that arise in soybean fields, potentially causing yield loss. This yield loss may be prevented by timely application of crop protectants that control pests. The study was designed to determine any yield effect caused by controlling soybean pests with the use of certain crop protectants.

Materials and Methods

The first year of the study at the Southeast Research and Demonstration Farm was in 2010. The study was planted in ground that was corn the previous year. A John Deere 7000 planter was set to plant 160,000 seeds per acre (spa) in 30-in. rows. Attachments included Yetter bubble-type coulter blades and Martin residue managers. Phosphorus and potassium levels were determined to be adequate, so none were applied. The soil pH was determined to be within an acceptable range, so no lime was applied. Soybean cyst nematode (SCN) levels tested low in the fall of 2008; nonetheless, an SCN-resistant soybean variety was planted in the study for 2010.

There were six treatments in the study. Each treatment was randomized and replicated four times. The treatments were 1) a check where no insecticides or fungicides were applied, 2) Headline fungicide applied at 6.0 ounces/acre at the R3 stage, 3) Baythroid XL insecticide applied at 2.8 ounces/acre when soybean aphids reached threshold, 4) Baythroid XL applied at 2.8 ounces/acre when bean leaf beetles reached threshold, 5) insecticides and/or fungicides applied in treatments 2, 3, and 4 simultaneously applied, and 6) Baythroid XL applied at 2.8 ounces/acre using low pressure with spray tips that create large droplets. Treatment 6 was designed to represent what might occur if an insecticide were tank mixed with the last herbicide application. The application in treatment 6 is not recommended by Iowa State University (ISU) but is sometimes used by producers looking to eliminate a pass across the field.

Results and Discussion

Aphid and bean leaf beetle numbers were minor problems in 2010, but other insects were present early. Because of this, treatments were adjusted. The two insects that were present early were leaftiers and green clover worms. Thresholds are not well established for these insects, but a 20 percent defoliation threshold was adopted for the study. Then, if either insect pest reached this threshold, the problematic insect would be substituted for either the aphid or bean leaf beetle treatment, depending on which of these insects were determined to be less problematic. However, none of the pest insect numbers reached the thresholds; therefore, none of the insecticide treatments were applied to treatments 3, 4, or 5. Consequently, this study ended up with three checks (treatments 1, 3, and 4) and two Headline treatments (treatments 2 and 5), and the study contained only limited information on yield effects caused by pest insects or their control.

Soybean yields numerically increased as a result of the Headline application for treatments 2 and 5 as compared with the checks shown in Figure 1. However, there was no yield response, either positive or negative,

to the insecticide applied in treatment 6. Crop consultants who recommend against applying an insecticide with the last herbicide pass suggest that if an insecticide is added to an herbicide application, especially before pest insects reach threshold, beneficial insects may be killed along with the pest insect. However, the pest insects might not be controlled well with the lower pressures and larger droplet sizes used for herbicide applications. This situation is believed to allow the pest insect to subsequently increase unchecked due to the loss of predator insects, potentially creating an even worse pest problem. However, in 2010 there were few pest insects throughout the year, possibly preventing these pest insects from increasing as a result of the early insecticide application of treatment 6. This research project will continue in the future to try to resolve these and other pest issues observed in soybeans.

Acknowledgements

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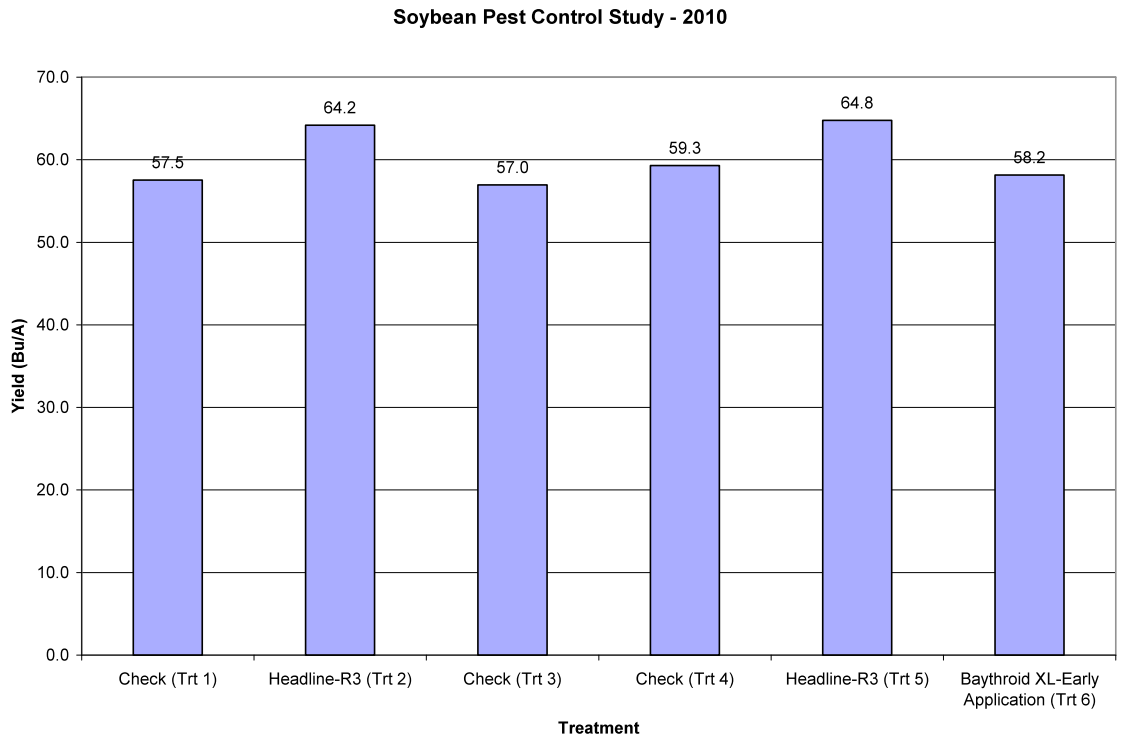

Figure 1. **Soybean grain yield as influenced by pesticide applications, Southeast Research and Demonstration Farm 2010.**