



8 August 2013

Jennifer Reed-Harry
PA Soybean Board
2215 Forest Hills Drive Suite 40
Harrisburg, PA 17112

Jennifer:

The following is my final report for the project “**Developing a slug management program for soybeans based on slug feeding preferences,**” which the Soybean Board was generous enough to fund from 2013 to 2013.

The two goals of this project were to determine: 1) feeding preferences for slugs among soybeans, various cover crop species, and common weed species; and 2) the utility of an inter-row crop for limiting slug damage to soybeans.

Our lab-based feeding experiments revealed that gray garden slugs, the dominant slug species in our Pennsylvania crop fields, strongly prefer feeding upon both soybeans and corn over lambsquarters, Italian ryegrass, daikon radish, and crimson clover. We did not compare soybeans and corn directly because this contrast is not relevant for management options. We tested feeding preferences of slugs for various cover crop species to determine if cover crops could be used as slug management tools. While slugs preferred corn and soybeans over a suite of cover crop species and one weed species, their preference appeared strongest when compared to crimson clover—*slugs consistently avoided crimson clover in our lab feeding assays*. These results are interesting because previous field research that we conducted indicated that corn grown following a crimson clover cover crop receives significantly less damage than corn grown following daikon radish or Italian ryegrass; thus, while radish and ryegrass were also not chosen by slugs in our lab assays they appear to have a different influence on slugs than crimson clover—slugs will feed on these other species, but tend to prefer grain crops when given a choice. Our lab data from the recently expired project suggests that crimson clover may be repellent somehow, which would explain why slugs did not feed upon it and why we saw the least amount of damage in corn following crimson clover. We hypothesize that crimson clover-planted fields harbor smaller populations of slugs, and now need to test this hypothesis in a field experiment. Fortunately, some of the data collected with this project, as well as previous projects funded by the Pennsylvania Soybean Promotion Board, provided a strong base of preliminary data for a grant we just received from the USDA Northeast IPM Center to test the slug-management potential of crimson clover.

The recently funded IPM project was also partially based on the second object of our recently expired Soybean Board project. As stated above, this objective was to “test the utility of an inter-row crop for limiting slug damage to soybeans.” For this objective we conducted a field experiment at our Centre County research farm where we established in a single pass with the planter soybeans on 30” spacing and a row of cereal rye between the soybeans; this latter row was established by putting rye seed in the fertilizer boxes of our planter (this approach was somewhat inelegant because it established a thicker row of rye than was necessary, but it worked). As mentioned above, our previous feeding preference studies revealed that gray garden slugs preferred to eat cereal rye over soybeans. This finding was confirmed in our field experiment where we saw virtually no slug damage in soybean plots planted with cereal rye between the rows, whereas we found slug damage to soybeans in plots without the cereal rye. Unfortunately, slug pressure was low during our experiment in 2012, but we found good support for the concept that cereal rye may be able to decrease slug feeding on soybeans. Of course, a benefit to using rye as a control option is that once the threat of slug damage is passed (i.e., the beans are large enough), the cereal rye could be killed with a post-emergence application of glyphosate in herbicide-tolerant soybean fields.

Now with our USDA NE-IPM grant, we can test the potential of this slug-management option in more detail. The progress we have made so far is attributable to the funding we have received from the Pennsylvania Soybean Promotion Boards.

Thank you very much for your generous support. If you need further details, please let me know.

Best regards,

A handwritten signature in black ink that reads "John Tooker". The signature is written in a cursive, flowing style.

John Tooker

Assistant Professor & Extension Specialist