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How Well Does Slug Bait Work?

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No-till farmers in the Shenandoah Valley of Virginia often struggle with slug damage in corn and soybean fields. Surface residue (which is a benefit of no-till farming) offers a favorable habitat for slugs. Slugs feed on seedling corn and soybean; often resulting in significant stand loss and /or slowing crop development. One management option available to farmers is the use of Deadline Slug Bait (a mini-pellet impregnated with 4% Metaldehyde). The bait must be spread in the field and consumed by the slugs to be effective. During 2008 and 2009 slug bait was applied in thirteen different corn and soybean fields in the Shenandoah Valley to evaluate its effectiveness.

All of the fields (except one) showed signs of significant slug feeding prior to bait application. The areas selected for the plots also had uniform stands and uniform soils. After problematic fields were identified, slug bait was applied as soon as weather permitted. The plots were arranged in a replicated strip plot design with each treatment (bait versus no bait) replicated four times in each field. All of the plots were at least 150 feet long. Slug bait was applied using a push type spreader or using a spreader mounted to a four wheeler. The goal was to apply 10 pounds of bait per acre. The actual rate was about 20 pounds per acre when using the push type spreader and 10 pounds per acre with the four wheeler. For the 2008 and 2009 crop season the Deadline Slug Bait (when applied at 10 pounds per acre) cost $22 per acre. Stand counts to evaluate population were taken when the corn was at least knee high. Yield data was collected on all of the plots (except the Dirting plot) by harvesting the entire plot length using the farmer's combine and a weigh wagon. Yield on the Dirting corn plots was collected by hand harvesting two twenty-foot long rows.

Most of the plots were revisited several times within the two weeks after slug bait application to observe the treatments. In almost every corn plot there was obviously less (or no) slug feeding where the bait was applied versus were no bait was applied within a week of slug bait application. In most situations where slug bait was applied, evidence of slug feeding on plants began again about three weeks after bait application. We presumed that rainfall dissolved the bait and additional slugs hatched. Although no direct measurements were taken, it appeared that a rainfall event of 0.1 to 0.2 inches had a minimal effect dissolving the bait. However, a rain of 0.5 inches or more appeared to dissolve 80 percent of the bait or more. It was difficult to notice feeding patterns in the soybean plots.

Plant population and yield response data are shown in Tables 1and 2. Statistical analysis of the individual plots indicates that both population and yield was only significantly different at three out of ten sites. This means we can only be 90% certain (LSD = 0.1) that the application of slug bait resulted in a yield response in three out of ten plots. However, in nine out of ten plots there was a slight numerical population and yield response. Some would argue that "surely a numerical yield and population response in 9 out of 10 plots warrants attention." Further study and a greater number of experiments will be necessary to draw final conclusions.

Based on these data, we conclude the following:

- Additional work to further evaluate the benefit of slug bait is warranted to understand when an application will provide an economical response. This is more of a vote in favor of slug bait than against slug bait. In many cases, after installing 13 test plots to evaluate a product the conclusion is *"the product does not work go find an alternative."* In this case the product appears to work (i.e. provide some control of slugs) but we are not sure it works well enough to be economical. The median yield response in the six corn for grain plots and the three soybean plots was 3.2 and 2.6 bushels per acre respectively. Even if we assume that farmers can get this type of response consistently, the cost of the bait exceeds the value of 3.2 or 2.6 bushels per acre of corn and soybeans respectively.
- It is not clear that slug bait will consistently prevent slug damage in soybean. This is primarily due to the fact that the growing point of soybean is above ground when the plants emerge from the ground. In many cases the first visible symptoms of slug feeding in soybean shows plants that will not recover. There is not adequate time to see visible slug pressure in soybean and subsequently apply slug bait to emerging soybean before the slugs kill some plants. If there is a way to predict fields with significant slug pressure prior to soybean emergence then slug bait might work well on soybean.

Table 1: Plant Population and Yield Response to Slug Bait in Corn*

	Population	LSD = 0.10	Yield	LSD = 0.10
B-Mont Corn 2009	2,275	NS	2.4 Bu/A	NS
Dirting Corn 2009	1,100	NS	1.2 T/A	NS
Fleming Corn 2009 **	1,584			
Shillingburg Corn 2009	1,250	NS		
B-Mont Corn 2008	6,188		19 Bu/A	NS
Vann Corn 2008	2,688		4 Bu/A	NS
Grandview Corn 2008	1,250	NS		
Reeves 1 Corn 2009			51 Bu/A	
Reeves 2 Corn 2009			-18 Bu/A	NS
Myers Corn 2009			1.7 Bu/A	NS

* Example: A population response of 2,275 plants per acre was an average plant population of 30,000 plants/acre where bait was applied versus 27,725 where no bait was applied (30,000 – 27,725 = 2,275).
** The Fleming field had historical slug pressure and bait was applied within a few days of corn emergence. There was minimal visible signs of slug pressure prior to bait application. The soils were too un-uniform to collect yield data.

Table 2: Plant Population and Yield Response to Slug Bait in Soybean*

	Population	LSD = 0.10	Yield	LSD = 0.10
B-Mont Soy 2009	3,000	NS	2.7 Bu/A	
B-Mont Soy 2009	-1,607	NS	2.6 Bu/A	
Wisman Soy 2009	26,384	NS	1.6 Bu/A	NS

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