Final 2014 Delaware Soybean Board Report

Title: Management of Slugs in Delaware Soybean Fields

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Objectives:

1. Document the economic loss of slugs in Delaware no-till soybean fields.

2. Evaluate the effectiveness of alternative chemistries for slug management in soybeans.

(I) Document the economic loss of slugs in Delaware no-till soybean fields- Grower Surveys

Determining the economic losses associated with slug infestations can be challenging because in many situations, soybeans are capable of compensating for stand reductions and can tolerate a considerable amount of foliar feeding. As a result, there is not much information documenting economic losses associated with slug infestations on soybeans in Delaware. In many situations, the slug infestation goes unnoticed until significant stand reductions have occurred. When slug infestations are severe, it is not uncommon for plant populations to be reduced to levels that require the field to be replanted. Aside from the costs associated with replanting (i.e. seed, labor, fuel, etc.), there may also be additional economic losses due to a later planting date and reduced yield potential. Documenting the economic loss of slugs in Delaware no-till soybeans is important because it is required to pursue an emergency use label (Sect 18) as well as future labeling of chemistry to control slugs in soybeans.

Field Survey Results- 2013

In 2013, we sampled 13 no-till soybean fields across the state before planting with a history of slug problems. Each field was sampled using shingle trapping methods prior to planting by placing five 1 ft^2 shingle traps in each field and monitoring the traps weekly until planting to determine slug population composition and density estimates. At each of the sampling locations, we also searched under the crop residue, recording the total number of slugs by species and the presence of slug eggs. After planting, we monitored 28 soybean fields for slug feeding damage by taking stand counts in 10 random locations in each field and estimated the percentage of plants with slug feeding damage. The fields were sampled to establish base line data on the slug pressure in each field and to locate fields that are at risk for economic losses due to slug infestations.

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Table 1. Pre-Plant Sampling Results

Sampling Date	Shingle Samples					Residue Samples 1 ft x 1 ft				
	Marsh		Grey Garden			Marsh		Grey Garden		
	Juvenile	Adult	Juvenile	Adult	Eggs	Juvenile	Adult	Juvenile	Adult	Eggs
Field 1										
4/9	0	0.2	0	0	0	0	0.2	0	0	0
4/16	0	0	0	0	0	0	0.2	0	0	0
4/23	0	0	0	0	0	0	0.4	0	0	0
4/30	0	0	0	0	0	0	0.6	0	0	0
5/8	0	0	0.2	0	0	0	0	0	0	0
Field 2										
4/9	0	0	0	0	0	0	0	0	0	0
4/16	0	0.8	0	0.4	0	0	0.4	0	0	0
4/23	0	0.2	0	0.4	0	0	0	0	0.2	0
4/30	0	0.2	0	0	0	0	0	0.6	0.6	0.2
5/8	0	0	1	0	0	0	0	0	0	0
Field 4										
4/9	0	1	0	0	0	0	0.4	0	0	0
4/16	0	0.8	0	0	0	0	0.4	0	0	0
4/23	0	4	0	0	0	0	2	0	0	0
4/30	0	0.6	0	0	0	0	1.2	0	0	0.2
5/7	0	1.4	0	0	0	0	0.8	0	0	0.4
Field 5										
4/9	0	2.2	0	0	0	0	0.2	0	0	0
4/16	0	3.4	0	0	0	0	1.2	0	0	0
4/23	0	3	0	0	0	0	1	0	0	0
4/30	0	2.4	0	0	0	0.2	1	0	0	0.8
5/7	0	2.8	0	0	0	0	1.2	0	0.2	0
Field 6										
4/30	0	1	0	0	0	0	0.4	0	0	0
5/7	0	0.4	0	0	0	0	0	0	0	0
Field 7										
4/3	0	0.4	0	0	0					
4/9	0	1	0	0	0	0	0	0	0	2.2
4/15	0	1	0.2	0	0	0.2	0.2	0	0	1.8
4/23	0	1.2	0	0	0	0	0	0	0	0
5/7	0	1.6	0	0.6	0	0	0.4	1.6	0	1.6

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Sampling Date	Shingle Samples					Residue Samples 1 ft x 1 ft				
	Marsh		Grey Garden			Marsh		Grey Garden		
	Juvenile	Adult	Juvenile	Adult	Eggs	Juvenile	Adult	Juvenile	Adult	Eggs
Field 8										
4/3	0	0.4	0.8	0	0	0	0	0	0	0
4/9	0	0	0.8	0	0	0	0	0	0	0
4/16	0	1.6	0	0	0	0	0	0	0	0
4/23	0	1.2	0	0.4	0	0	0	0	0	0
5/1	0	0	0	0	0	0	0	0	0	0
Field 9										
4/3	0	1.2	0	0	0	0	0	0	0	0
4/9	0	0.6	0	0	0	0	0	0	0	0
4/16	0	0.4	0	0.2	0	0	0	0	0.2	0
4/23	0	1	0	0	0	0	0	0	0	0
5/1	0	0	0	0	0	0	0	0	0	0
Field 10										
4/16	0	0	0	0	0	0	0	0	0	0
4/24	0.4	0.8	0	0.2	0	0	0	0	0	0
5/2	0	0	0	0	0	0	0	0	0	0
Field 11										
4/16	0	0.4	0	0	0	0	0	0	0	0
4/24	3.2	0.2	0	0	0	0	0	0	0	0
5/2	0	0	0	0	0	0	0	0	0	0
Field 12										
4/23	0	0	0	0	0	0	0	0	0	0
Field 13										
4/23	0	0	0	0	0	0	0	0	0	0

Table 2. Post-Planting Sampling Results: Stand and Percent Damaged Plants

Sample Date	# plants/3 ft row	% Slug Damaged Plants
Field 1		
5/30	13.8	11.59
6/4	12.2	15.57
6/11	9.7	3.09
6/20	12.2	0.82
6/24	14.3	0.70
Field 2		
5/30	10	37.00
6/11	8.1	43.21
6/20	9.1	3.30
6/24	9.6	0.00

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Sample Date	# plants/3 ft row	% Slug Damaged Plants
Field 3		
6/4	12.7	0.00
6/19	11.8	13.56
6/24	12.5	3.20
Field 4		
5/30	12.6	7.14
6/4	13.1	9.92
6/19	13	18.46
6/24	10.8	1.85
Field 6		
6/4	13.3	9.02
6/12	11.4	18.42
6/20	11.4	14.91
6/25	11.6	5.17
Field 8		
7/17	8.3	8.62
Field 9		
7/17	8.9	7.87
Field 14		
6/4	23.6	15.68
Field 15		
6/13	10.7	6.54
6/19	10.3	21.14
Field 16		
6/20	12.0	0.00
Field 17		
6/19	9.5	54.74
Field 18		
6/27	6.4	39.22
6/19	11.5	31.30
Field 19		
6/20	9.3	0.00
Field 20		
6/19	17.7	0.00
Field 21		
6/19	7.1	69.01
6/27	7.4	10.81
Field 22		
6/19	6.9	47.83
6/27	6.4	23.44

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Sample Date	# plants/3 ft row	% Slug Damaged Plants
Field 23		
6/19	13.3	0.00
Field 24		
6/20	12.6	3.97
Field 25		
6/20	11.6	62.07
Field 26		
6/27	11.6	0.86
Field 27		
6/27	10.9	3.82
Field 28		
6/19	12.6	11.90

Field Survey Results – 2014

In spring of 2014, eight fields with small grain cover crop and six fields without cover crop were sampled using shingle trapping methods and searching under crop residue on a weekly basis from mid-April until mid-May to measure slug species composition and population densities; and to determine what influence fall seeded small grain cover crops have on slugs. After plant emergence, slug feeding injury on soybean was assessed by establishing stand counts and determining the percent of plants with slug damage

(A) Pre-Plant Sampling for Slugs: In each field sampled, five shingle traps 1 ft^2 were randomly placed throughout the field and checked on a weekly basis, recording the number of adult and juvenile gray garden and marsh slugs, the predominant slug species of economic importance in Delaware. The number of slug eggs was also recorded. At each sampling location, a 1 ft^2 area was searched under crop residue for slugs and eggs to compare to shingle trapping methods.

Table 3. Average number of slugs and eggs using shingle trapping and residue sampling methods in fields with and without fall seeded small grain cover crops

Sampling Method	Avg. # of Marsh Slugs		Avg. # of Gray Garden Slugs		
	Juvenile	Adult	Juvenile	Adult	Slug Eggs
Fields with Cover Crop					
Shingle Trap	0.13	0.59	0.00	0.01	0.07
Crop Residue 1ft^2	0.06	0.20	0.02	0.03	0.01
Fields without Cover Crop					
Shingle Trap	0.03	0.36	0.00	0.00	0.00
Crop Residue 1ft^2	0.07	0.15	0.00	0.00	0.01

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(B) In- season Slug Injury on Soybean: Six fields with small grain cover crop and ten fields without were sampled on a weekly basis for evidence of slug feeding damage on emerging and seedling soybean. Slug injury on soybean was measured by performing stand counts and by determining the percentage of plants with slug feeding injury. Stand counts were determined by counting the number of plants per three linear row ft in ten random locations throughout the field and used to document potential stand reductions as a result of slug feeding. The percentage of slug feeding injury was determined by counting the number of plants with new feeding damage in ten consecutive plants in ten random locations in each field.

Conclusion: In 2013, although slug feeding was present in approximately 90 percent of the fields surveyed, significant stand loss only occurred in 2 of the 28 fields sampled. In speaking with producers, it was difficult to determine if this resulted in significant yield loss due to plant compensation. In 2014, overall, slug populations were also low, regardless of whether a field was planted in small grain cover crop or not. The differences between shingle trapping and searching under crop residue for slug and egg counts were minor and not thought to be significant. No reductions in stand counts from slug feeding damage were recorded. The percentage of soybean with slug feeding injury averaged across all sample dates and fields were similar for the fields with small grain cover crops (8%), compared to the fields without cover crops (7%).

(II) Document the economic loss of slugs in Delaware no-till soybean fields Demonstration Site in 2013

A demonstration plot was established in a commercial no-till soybean field located near Middletown, DE with severe above and below ground slug feeding damage. The objective of the demonstration plot was to determine the potential economic losses from slugs. The field was monitored on a weekly basis after emergence for plant population and percent damaged plants by dividing the field into three zones based on the severity of slug feeding damage; A (minor), B (severe), and C (moderate to severe). Stand counts were taken by recording the total number of plants in 30 row ft. in ten random locations in each zone. Percent damaged plants were determined by recording the number of plants within each sampling location with slug feeding damage on the newest emerged leaves. To determine the possible yield losses associated with slug damage, GPS coordinates were recorded marking areas in the field with the most and least severe slug feeding damage. This information was superimposed onto a yield map to determine what impacts slug feeding may have caused on yield

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Table 4. Demonstration Plot 1: Plant Population and Percent Damaged Plants

Sample Date	Plant Population (plants/A)			Percent Damaged Plants		
	A	B	C	A	B	C
4-Jun (pre-trt)	85,233	59,774	76,931	17.5	36.1	41.0
10-Jun (4 DAT)	161,389	114,068	134,740	17.9	22.7	11.8
19-Jun (13 DAT)	208,959	151,925	117,057	9.2	14.3	18.7
26-Jun (20 DAT)	222,408	149,434	148,438	0.1	0.8	0.5

Table 5. Yield Data by Zone

Level of Slug Damage	Yield (BU/A)
Minor (Zone A)	62.9
Moderate to Severe (Zone B & Portions of Zone C)	59.9
Replanted (Zone C)	56.4

Conclusion: In the worst areas of the field, Zones B and C, significant stand losses were observed compared to Zone A which had very low slug pressure (Table 4). Deadline M-Ps were aerially applied on June 6 to prevent any further stand losses from occurring and to protect the plants that had emerged. Prior to the aerial application of Deadline M-Ps, Zone B and C experienced significant slug feeding damage with the percentage of damaged plants reaching 36.1 and 41.0 percent, respectively. After the Deadline M-Ps application, the percent of damaged plants was reduced drastically as indicated in Table 4. A portion of Zone C was replanted because stand losses were so severe which explains the substantial increase in the plant population on June 26. When comparing the yield data from Zone A with minor damage to Zone B and portions of Zone C with moderate to severe damage, the results indicate that the feeding damage from the slugs resulted in a 3 bu/A loss (Table 5).

The yield in the replanted area in Zone C was 6.5 bu/A lower compared to Zone A with minor feeding damage (Table 5). However, slug feeding injury may not be the sole cause of yield loss. Yield limiting factors such as delayed planting date, soil type, variety, and damage to the existing stand from inter-seeding may have contributed to lower yields in the replanted zone. Nonetheless, slugs were responsible for the severe stand loss which required the grower to spend additional resources including time, fuel, and seed to replant. This resulted in a greater economic loss compared to the other zones. In some cases, the true economic losses due to slug infestations is not limited to yield loss associated with feeding injury but may also include losses associated with reduced yield potential and the costs of replanting.

(III) Evaluate the effectiveness of alternative chemistries for slug management in soybeans

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Slug management in no-tillage soybeans can be a challenge because slugs often feed below ground, severing the hypocotyl and killing the plant before it has a chance to emerge. Usually, the problem is not identified until the soybeans have failed to emerge, at which point the field has likely experienced a significant stand reduction. Rescue treatments to prevent additional stand losses and damage to emerged plants has traditionally included a broadcast application of a metaldehyde bait (i.e. Deadline M-Ps). However, there are additional available slug management products in the marketplace that may provide control but local data evaluating efficacy of these products in soybeans is limited.

In 2013, two small plot replicated research trials were established to evaluate efficacy of all the available slug control products to manage slugs in soybeans. A third large plot trial was established to evaluate the effectiveness of applying Deadline M-Ps as a rescue treatment when slug pressure is high.

In 2014, we were not able to establish a slug trial due to low slug pressure in soybeans throughout the state. Therefore in the fall of 2014, 7 fields with a potential for slug pressure were sampled to identify sites for a potential slug trial in 2015 from mid-October through mid- November. These fields will be sampled again in the spring to determine the potential as possible replicated research trial sites.

In 2013, the first trial was established in a commercial soybean field located near Middletown, DE with severe above and below ground slug feeding. The objective of this trial was to evaluate each of the products ability to control slugs as a rescue treatment. The second trial was established in a soybean field located at the Delaware State University's Smyrna Outreach and Research Center with a history of slug problems. The objective of this trial was to evaluate the efficacy of each of the products applied preventatively when conditions are favorable for slug activity and the likelihood of having a problem is high. The third trial was established in a commercial soybean field located near Cecilton, MD with a moderate to severe grey garden slug infestation. The objective of this trial was to evaluate the effectiveness of a broadcast application of Deadline M-Ps applied as a rescue treatment after planting as the soybeans germinate and begin to emerge.

In addition to the replicated research plots, a demonstration plot was established to evaluate the effectiveness of applying Deadline M-Ps preventatively when replanting is required. The demonstration plot was on a no-till soybean field located near Earleville, MD that experienced severe slug feeding damage and significant stand reductions. Slug pressure was high and the entire field needed to be replanted. Tillage is the most recommended control tactic when replanting is necessary due to stand loss from slugs; however, tillage is not always an option. Metaldehyde baits can significantly reduce slug pressure when applied as a rescue treatment to protect the plants that have emerged and the slugs are feeding above the soil surface but there is little information available about the effectiveness of the baits when applied in a replant situation.

Results -- Rescue Treatment Trial (2013): Replicated research plots were established in a commercial no-tillage soybean field with severe slug pressure. At the time of treatment, there was below ground and above ground slug feeding on the soybean plants and substantial stand reductions had occurred. Plots were 15 ft wide x 20 ft long

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arranged in a randomized complete block design with four replications. Treatments included (1) Lannate LV at 1.5 pt/A, (2) Sluggo at 20 lb/A, (3) Iron Fist at 20 lb/A, (4) Ferroxx at 20 lb/A, (5) Deadline M-Ps at 10 lb/A, and (6) an untreated check. The Lannate LV treatment was applied on June 4 at 5:15 pm using a CO_2 pressurized backpack sprayer equipped with a 6 nozzle boom delivering 16.9 gpa at 40 psi. It was hot and sunny with an average wind speed of 4.7 mph, making the conditions unfavorable for slug activity at the time the Lannate LV application was made. The dry formulations were made using a hand seeder calibrated for each of the products. Pre-treatment and post-treatment evaluations included stand counts and percent damaged plants. Stand counts were determined by counting the total number of plants in the center two rows of each plot and reported as plants per acre. The percent damaged plants was determined by examining the number of plants within the center two rows with slug feeding damage on the newest growth. Yield was calculated by harvesting the center two rows from each plot and reported as grams per plot.

Table 6. Soybean Trial 1 (Rescue Treatment): Stand Counts and Yield

Treatment	Rate/A	Stand Count (plants per Acre)					Oct 14 Yield (grams)
		June 4 Pre-Trt	June 10 6 DAT	June 13 9 DAT	June 18 14 DAT	June 26 22 DAT	
Lannate LV	1.5 pt	83,823a	68,389a	80,150a	79,715a	68,389a	943.2a
Sluggo	20 lb	69,117a	77,972a	90,605a	87,991a	90,605a	901.5a
Iron Fist	20 lb	73,529a	63,162a	59,242a	79,715a	72,745a	844.5a
Ferroxx	20 lb	67,647a	84,942a	90,605a	90,605a	95,832a	881.2a
Deadline M-Ps	10 lb	67,647a	75,975a	87,991a	90,605a	95,832a	861.7a
Check	--	80,882a	56,193a	59,242a	60,984a	61,855a	882.4a

Means in the same columns followed by the same letter are not significantly different (Tukey's; P=0.05).

Table 7. Soybean Trial 1 (Rescue Treatment): Percent Slug Damaged Plants

Treatment	Rate/A	% Slug Damaged Plants				
		June 4 Pre-Trt	June 10 6 DAT	June 13 9 DAT	June 18 14 DAT	June 26 22 DAT
Lannate LV	1.5 pt	71.2a	83.4a	46.3a	42.0ab	34.2a
Sluggo	20 lb	92.6a	64.1a	20.5c	36.1b	21.8ab
Iron Fist	20 lb	79.9a	50.4a	22.1bc	35.0b	18.6ab
Ferroxx	20 lb	92.9a	58.4a	20.1c	30.8bc	21.3ab
Deadline M-Ps	10 lb	65.6a	55.0a	17.7c	15.2c	9.6b
Check	--	74.6a	88.1a	44.8ab	56.6a	28.8a

Means in the same columns followed by the same letter are not significantly different (Tukey's; P=0.05).

Conclusions: There were no significant differences between treatments for stand count at any of the sampling dates (Table 6). In addition, no significant differences in yield

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were found between the treatments and the untreated check. At 9 days after treatment, the Sluggo, Ferroxx, and Deadline M-Ps treatments had significantly fewer plants with slug feeding damage compared to the untreated check (Table 7). At 14 days after treatment, the percentage of plants with new feeding damage was significantly less for all the treatments compared to the untreated check except the Lannate LV treatment. The weather conditions were not favorable for slug activity at the time the Lannate LV application was made. Experience suggests that Lannate LV only has contact activity on slugs which may explain the poor results. The Deadline M-Ps treatment provided the greatest length of control being the only treatment that was significantly different compared to the untreated check for the percentage of damaged plants at 22 days after treatment.

Results- Preventative Treatment Trial (2013)

This trial was conducted to determine if a preventative treatment can be applied prior to plant emergence to reduce losses from slugs. This trial was established in a soybean field located at the Delaware State University's Smyrna Outreach and Research Center with a history of slug problems. The field was determined to be at risk for slug problems based on field history, pre-plant slug sampling results, and favorable weather conditions for slug activity at the time of planting. Plots were 15 ft wide x 20 ft long arranged in a randomized complete block design with four replications. The treatments included (1) Sluggo at 20 lb/A, (2) Iron Fist at 20 lb/A, (3) Ferroxx at 20 lb/A, (4) Deadline M-Ps at 10 lb/A d (5) an untreated check. Treatments were applied on June 25 prior to plant emergence using a hand seeder calibrated for each product. The percent damaged plants was determined by counting the total number of plants and the number of plants with new slug feeding damage in two random, three foot sections per plot. Slug pressure was low to moderate and shortly after plant emergence, the weather conditions quickly became less favorable for slug activity.

Table 8. Soybean Trial 2 (Preventative Treatment): Percent Damaged Plants

Treatment	Rate/Acre	Percent Damaged Plants		
		July 3 8 DAT	July 11 16 DAT	July 17 22 DAT
Sluggo	20 lb	6.8a	0a	0a
Iron Fist	20 lb	9.1a	0a	0a
Ferroxx	20 lb	3.7a	0a	0a
Deadline M-Ps	10 lb	3.2a	0a	0a
Check	--	35.8b	0a	0a

Conclusion: At 8 days after treatment, all of the treatments had significantly fewer damaged plants compared to the untreated check (Table 8). However, at 16 and 22 days after treatment, there was no new slug feeding damage on any of the plants, regardless of the treatment. The drastic reduction in slug activity is likely a result of the hot weather conditions that may have caused slugs to move deeper in the soil profile and caused the plants to grow rapidly. Additional data needs to be collected to determine if treating preventatively is a suitable management strategy when weather conditions are favorable for slug activity over prolonged periods of time and under heavy slug pressure.

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Results: Evaluation of Metaldehyde as Rescue Treatment to Control Slugs on Soybeans - Large Plots (2013)

Slugs are capable of reducing stand, potentially resulting in significant economic losses due to replanting costs and yield reductions. Identifying slug problems early, before and during plant emergence and applying a metaldehyde bait could prevent significant stand losses. Additional information is needed to evaluate the effectiveness of this control strategy in soybeans. The objective of this trial was to evaluate the effectiveness of applying a metaldehyde bait as a rescue treatment during soybean emergence when slug pressure is high and the weather conditions are conducive for slug activity.

Plots were established on a no-till soybean field located near Cecilton, MD with high grey garden slug populations and moderate below ground feeding damage on the germinating/emerging soybeans. The plots were 30 ft wide by 50 ft long arranged in a randomized complete block design with three replications. Treatments consisted of (1) a broadcast application of Deadline M-Ps at 10 lb/A applied on June 11 and (2) an untreated check. Pre and post-treatment stand counts were determined by counting the total number of emerged plants in ten linear ft of row in three spots in each plot. The percentage of damaged plants was determined by recording the number of plants with slug feeding damage on the newest emerged leaves in each ten linear ft of row.

Table 9. Soybean Trial 3 (Evaluation of Metaldehyde): Stand Counts

		Stand Count (plants per Acre)		
Treatment	Rate/Acre	June 10 Pre-Trt	June 18 7 DAT	June 26 15 DAT
Deadline M-Ps	10 lb	103,772a	122,036a	111,244a
Check	--	91,320a	131,168a	116,778a

Table 10. Soybean Trial 3 (Evaluation of Metaldehyde): Percent Damaged Plants

		Percent Damaged Plants		
Treatment	Rate/Acre	June 10 Pre-Trt	June 18 7 DAT	June 26 15 DAT
Deadline M-Ps	10 lb	85.0a	16.1a	6.9a
Check	--	90.5a	26.3a	4.9a

Conclusion: There were no significant differences in stand between the Deadline M-Ps treatment and the untreated check on any of the sample dates (Table 9). At the time of application, most of the soybeans had already emerged, possibly explaining why no differences were observed for stand counts. There were also no significant differences for the percentage of damaged plants between treatments (Table 10). At 7 and 15 days after treatment, the percentage of damaged plants was relatively low despite the fact that the percentage of damaged plants was high prior to treatment. Weather conditions immediately after treatment may have had a positive effect on soybean growth, possibly explaining why no significant differences were observed.

Results : Metaldehyde Applied in Replant Situations (2013)

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Slugs are capable of causing significant stand reductions in soybeans, occasionally reducing plant populations to levels that would require replanting. Typically, when this is the case, tilling the field and replanting the entire field has been the most recommended approach. Tillage is often not an option due to enrollment in NRCS cost share programs, the inability to till fields due to the slope of the field, field moisture levels, and cost of seed. However, without tilling a field to reduce the slug population the replanted soybeans may once again be destroyed under severe slug pressure. The objective of this demonstration was to gain additional information on the effectiveness of metaldehyde bait applied at the time of replanting to protect the germinating soybeans from significant slug feeding damage.

Stand counts were taken on the initial planting, pre and post treatment, by counting the number of emerged soybeans per 30 ft of row in 15 random locations throughout the field. The percent damaged plants were determined by counting the number of plants with slug feeding damage on the newest emerged leaves in each of the 15 random sampling locations. The replanted soybean stand counts and percent damaged plants were evaluated post-treatment using similar methods.

The initial planting of the field had a plant population of 76,665 plants/A with 97 percent of the plants having slug feeding damage on June 18 (pre-treatment). On June 20, Deadline M-Ps were applied by air to the entire field at 10 lbs/A. On June 23, additional seed were inter-planted into the existing stand to boost the final plant population.

Table 11. Demonstration Plot 2 (Evaluation of metaldehyde Applied in Replanting Situations): Stand Counts and Percent Damaged Plants

	Initial Planting		Replant	
Stand Count (plants/A)	June 18 Pre-trt	June 24 4 DAT	July 2 12 DAT	July 10 20 DAT
	76,665	68,999	84,409	85,107
% Damaged Plants	97.1	11.6	5.78	2.91

Conclusion: The percentage of damaged plants for the initial planting was reduced from 97.1 (Pre-trt) to 11.6 percent 4 DAT (Table 11). The replanted soybeans had 5.8 and 2.9 percent damaged plants 12 and 20 DAT. Stand counts for the replanted stand also remained constant at 12 and 20 DAT suggesting the Deadline M-Ps reduced the slug population to levels that were no longer capable of significantly reducing the stand. While the application of Deadline M-Ps was successful in this demonstration plot at preventing significant stand losses and feeding damage from occurring on the replanted soybeans; the later planting date may have also played a role. The later plating date likely increased the rate of emergence of the replanted soybeans compared to the initial planting, allowing the soybeans to emerge before sustaining significant injury. Additional research needs to be conducted to determine if a metaldehyde bait can be applied in a replant situation and consistently be successful in reducing slug populations and preventing significant plant injury from occurring below ground.

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