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Final report for SPRI proposal "Influence of herbicides and cover crop management on control of ALS-resistant Palmer amaranth"

Dear Mr. Barton,

A field with a naturally occurring population of Palmer amaranth was identified in Levy County, Florida. The area was planted in rye that was approximately 1.5 m tall at the initiation of the trial. Prior to planting, the rye was sprayed with glyphosate then either rolled down, left standing, or disked in. Peanuts were planted across all three cover-crop scenarios. The herbicides listed below (Table 1) were all applied the day after peanut planting. After the applications were made, the site was visited weekly and the number of Palmer amaranth plants in each plot was counted. We considered that each herbicide had lost its effectiveness when the Palmer amaranth population reached 1 plant per 3 feet of peanut row. We set this threshold since that is when we considered that a postemergence herbicide application would be necessary.

No differences were detected between rolled or standing rye, so these data were combined. However, we found that the effectiveness of different preemergence herbicides on Palmer amaranth control can vary greatly. Prowl H₂O and Solicam were the least effective with control ranging between just a few days and approximately 1 week. Dual Magnum was better with 3 to 4 weeks of control, but Valor provided control for up to 2 months. We also found that the rye cover crop at this location did little to suppress Palmer amaranth growth. However, the rye at this location was relatively thin. Other research has shown that dense rye cover can greatly enhance weed control.

Prowl H₂O is highly effective on annual grasses, Florida pusley, and many other pigweed species. However, we have observed over the past several years that it is largely ineffective against Palmer amaranth. Therefore, if Prowl H₂O is the only preemergence herbicide in the program, plan to treat for Palmer escapes within the first week after planting. Conversely, Valor will generally provide excellent preemergence control, while also being somewhat cheaper to apply than Dual Magnum. However, it must be noted that the effectiveness of preemergence herbicides is closely related to the timing and amount of rainfall incorporation. At this location we had excellent and timely incorporation, but prolonged drought will likely result in each of these products totally failing to control Palmer amaranth.

It is our intention to use these data to give peanut producers a better understanding of what to expect from each preemergence herbicide and how to better plan a postemergence application. This same experiment is planned to be conducted at two locations in 2009. Hopefully the combined data set will provide sufficient insight on the effectiveness of preemergence herbicides on Palmer amaranth. Additionally, these data have been submitted to *Peanut Grower* magazine for distribution across all peanut growing states.

Table 1. Length of time each herbicide provided satisfactory control of Palmer amaranth.

| Herbicide | Rate | Duration of Palmer Amaranth Control* (in days) | |
|------------------------|-----------|---|----------|
| | | Rye cover | No cover |
| Prowl H ₂ O | 2 pt/A | 4 a | 2 a |
| Solicam | 1.5 lb/A | 11 b | 8 b |
| Dual | 1.33 pt/A | 20 c | 28 c |
| Magnum | | | |
| Valor | 3 oz/A | 60 d | >60 d |
| None | | 2 a | 1 a |

*Duration of control refers to the length of time (in days) that each herbicide held Palmer amaranth populations below 1 plant per 3 feet of row.

Kind Regards,

Jason Ferrell