2021 Final Report
Efficacy of Herbicides, Timing, and Tank Mixes on Novel Herbicide Tolerant Traits in MD Soybean Systems
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Herbicide trials evaluating the efficacy of various combinations of post emergent contact and systemic herbicides was conducted during the 2021 growing season to evaluate control of palmer amaranth. This is the second year of the research study. The selected site was part of an 8 acre field primarily with Sassafras soils with a heavy infestation of glyphosate and ALS resistant palmer amaranth the preceding crop year. A plot design consisting of both Enlist and Xtendflex soybean varieties was used to evaluate herbicide performance across an early and late treatment. The following 17 treatment protocols were evaluated:

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1	Control
2	Roundup
3	Liberty + AMS
4	Roundup + Liberty + AMS
5	Enlist One
6	Roundup + Enlist One
7	Roundup + Liberty + Enlist One + AMS
8	Liberty + Enlist One + AMS
9	Xtendimax + Drift Guard
10	Roundup + Xtendimax + DRA + VRA
11	Roundup + Xtendimax + Liberty + Drift Guard
12	Xtendimax + Liberty + Drift Guard
13	Select Max + NIS + AMS
14	Select Max + Xtendimax + Drift Guard
15	Enlist One + Select Maxx + NIS
16	Liberty + Select + AMS + NIS
17	Enlist One + Liberty + Select + AMS + NIS

Soybeans were planted on June 24 with Pioneer P45T88 Enlist E3 and Asgrow AG47XFO Xtendflex variety soybeans utilizing a complete randomized block split plot design. All plots received a burn down/residual treatment prior to soybean emergence. Treatment consisted of Dual Magnum at 1 pint per acre; Gramoxone SL 3.0 at 2 pints per acre and Roundup Powermax at 1 quart per acre. Plots were then split, with one half of the plots receiving an application of the post emergence treatments applied 22 days after burndown application (On-time or early treatment) and the other half of the plots receiving a postemergence application 46 days after initial burndown (non-timely or late treatment). Palmer amaranth plants were emerged and present across all plots with an average height of 4 inches at the time of the on-time or early application. Palmer amaranth plants had an average height of 24-30
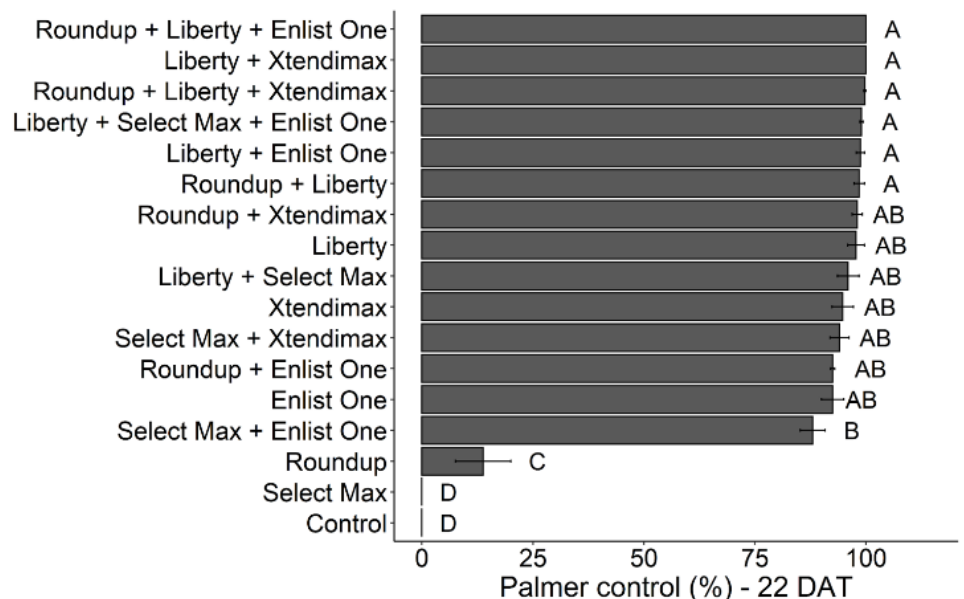
inches at the time of the late or non-timely applciation. Treatment was rated for percent control of Palmer Amaranth at 23, 32 and 60 days after postemergence application.

Results indicate that most tank-mix combinations tested provided adequate control of emerged Palmer amaranth, with no apparent antagonism. The treatment of Select Max + Enlist One resulted in significantly less control at 22 days after treatment. As expected, treatments with Roundup, Select Max and the control treatments had little to no control of Palmer amaranth. Additionally, the treatments applied late did not perform as well as the early treatment. This study confirms the importance of timely postemergence applications when Palmer amaranth weeds are still less than 4-6 inches in height.
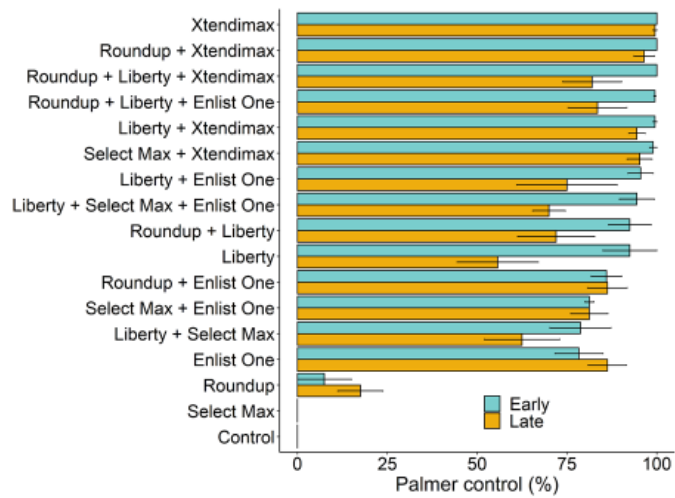
A separate trial at the same location was conducted to evaluate herbicide treatment protocols for grass control. Stands of fall panicum and barnyard grass were present in the test plots. Herbicide performance was evaluated at three time intervals. The plot size was 5 feet wide by 10 feet long. Pioneer P45T88 Enlist E3 were planted on June 24. Postemergence treatments were applied to all plots on July 23. . Barnyardgrass and fall panicum were primary species present. Grass was an average height of 15-20 inches in height. Control percentage was rated from 0-100 on August 4 and August 9 with non-treated control plots and non-treated running checks along each plot being used as a reference point for 0% control.
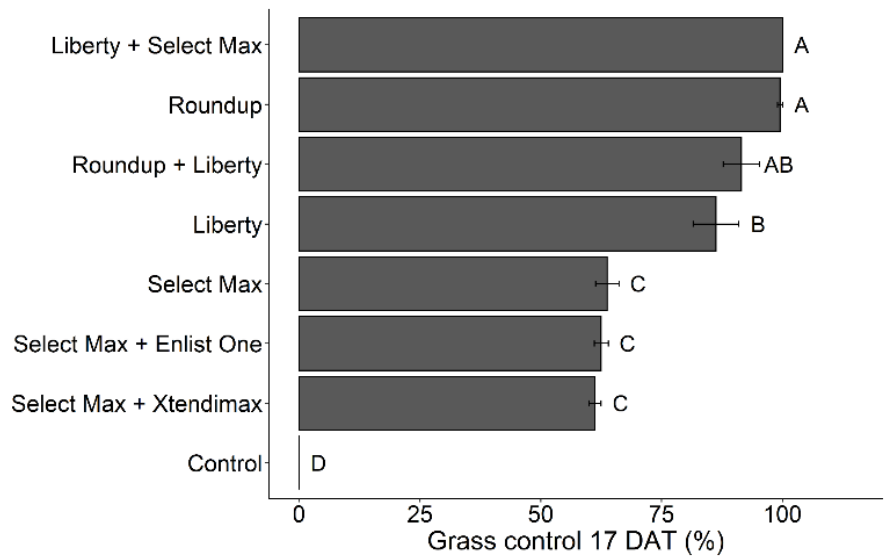
More information and detailed study results including trial photographs and data charts may be found in the supplemental document titled 2021 Soybean Weed Control Report-Beale.

Outreach Efforts:

For the fifth year, a team of Extension faculty from the Delaware, Maryland and Virginia collaborated to offer integrated weed management programming. The team was comprised of Michael Flessner and Vijay Singh from Virginia Tech, Mark VanGessel from the University of Delaware and Kurt Vollmer and Ben Beale from University of Maryland. Two in person sessions were conducted in Southern Maryland and Southside Virginia. A virtual meeting was also conducted using the Zoom platform. Meetings were well attended. Information learned from research studies was also shared at numerous crop production meetings throughout the state.