**2020 Final Report**

**Evaluating Novel Herbicide Tolerant Traits in MD Soybean Systems**

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Field Trials:

Herbicide resistant weeds such as Palmer amaranth (*Amaranthus palmeri*) pose significant challenges to Maryland soybean farmers. Previous studies over the past several years have examined various combinations of PRE and POST herbicides using existing herbicide tolerance technology, and have provided farmers guidance in managing this weed species. In recent years, numerous additional herbicide tolerant traits have been introduced, including RR2 Xtend (dicamba, glyphosate); RR2 Xtendflex (dicamba, glyphosate, glufosinate); LibertyLink (glufosinate); LibertyLink GT27 (glufosinate, glyphosate, HPPD); and Enlist E3 (2,4-D, glyphosate, glufosinate). These platforms offer greater flexibility and additional postemergence options that can be incorporated into an integrated weed management program. However, this gives rise to additional questions about the ability to tank mix various contact and systemic products and the effect on weed control and soybean performance. A field experiment was conducted in St. Mary’s County, MD in a field infested with glyphosate and ALS resistant Palmer amaranth. A randomized complete block, split-plot design was used to test 15 herbicide treatments and two application timings with four replicates (including a non-treated control). Herbicide treatments included each active ingredient targeting Palmer amaranth (glufosinate, dicamba, 2,4-D) alone, and in combination with sethoxydim and glyphosate to control grass weeds. Treatment protocol included a clean burndown program (paraquat) followed by application of a weak residual (*S*-metolachlor). Soybeans with Enlist and Xtendflex traits were planted, with dicamba and 2,4-D applications separated by an appropriate border. Initial results indicate that all tank-mix combinations tested provided adequate control of emerged Palmer amaranth, with no apparent antagonism, and no effect of application timing. Glufosinate alone provided weaker control of grass weeds than glyphosate or sethoxydim, and there appeared to be an antagonistic interaction between glyphosate and glufosinate in tank-mixes. Future work will repeat the 2020 experiment and include dicamba/glufosinate tank-mixes utilizing newer Xtendflex soybean technology. More information and detailed study results including trial photographs and data charts may be found in the supplemental document titled 2020 Palmer Amaranth Trial.

Outreach Efforts:

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. The original series of seven workshops were postponed in March of 2020 after just one session was completed. The team reformatted the effort as a two-day virtual training in December of 2020. The virtual meeting was complimented with a hard copy packet of program materials including A Practical Guide for Integrated Weed Management in Mid-Atlantic Grain Crops, Program Agenda, IWM Face Covering, and a program booklet with various fact sheets. The virtual sessions were well received with total attendance of 450 participants from the mid-Atlantic region and beyond. A follow-up survey was conducted with 199 total responses. Farmers indicated the program had a value of $4.50 per acre and crop advisors indicted a value of $3.33 per acre. The program was recorded and posted to the *GROW* website: <https://growiwm.org/mid-atlantic-workshop-on-herbicide-resistance-went-virtual-this-year/>