Title: Continued support for weed control research in wheat (FY16-FY17)
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PROBLEM STATEMENT
Questions on weed control and how different herbicides affect winter wheat continue to be asked by Michigan growers and herbicide dealers alike. Some of these questions have revolved around control of particular weed species (i.e., common windgrass), the effects of application timings (i.e., fall) and/or possible tank-mixtures on weed control and winter wheat yield, and also how some of these different practices may effect weed control in wheat. The Michigan Wheat Program has been very supportive in our efforts to provide answers to growers’ questions. However, many times after we have completed one of these more in-depth projects funded by the Michigan Wheat Program, and a new herbicide may become available or there may be some additional information that we would like to gather from some of our previous work. In FY16-17 we asked the Michigan Wheat Program for a small amount of funding to help support follow up questions and to conduct some preliminary research as new problems arise. This year we conducted two separate experiments to address the following questions.

Questions:
1) How does weed control and wheat yields of newer herbicides and herbicide programs compare with currently used herbicides?
   • This research specifically looked at comparing two new herbicides, Talinor and Quelex, with herbicides and herbicide programs currently used in wheat.
2) What options are there for roughstalk bluegrass control in winter wheat?
   • Roughstalk bluegrass is a new grass weed that is showing up more and more in Michigan wheat fields. This research was conducted to provide us with some preliminary information on roughstalk bluegrass control in wheat.

Research Study 1: Comparison of herbicides and herbicide programs for weed control and effects on wheat yield.

Procedures: ‘Sunburst’ soft red winter wheat was drilled in 7.5-inch rows at a rate of 1.8 million seeds/A on October 12, 2016 at Michigan State University campus in East Lansing. Each plot measured 10 feet by 30 feet and treatments were replicated four times. Seventeen different herbicides and herbicide mixtures were applied on April 24 when wheat was a Feekes stage 6. Herbicides included: Affinity BroadSpec, Huskie, Talinor, Quelex, 2,4-D, Clarity, WideMatch, Osprey, and PowerFlex HL. Herbicide treatments were compared to an untreated control and were evaluated for weed control, wheat injury and effects on wheat yield.
**Results and observations:**

- All herbicide treatments provided less than 5% injury within 14 days after treatment.
- Osprey and PowerFlex HL and tank-mixtures with these products were effective in controlling annual bluegrass.
- The new herbicides Quelex and Talinor provided similar control of common chickweed, henbit, and shepherd’s-purse as Affinity BroadSpec, Huskie, PowerFlex and WideMatch.
  - Exception Talinor did not provide good control of henbit.
- Excellent wheat growth with a competitive stand provided good control after winter annual weeds matured and discouraged summer annual weed growth.
- Yield was not affected by any herbicide or herbicide combination.
- This research was highlighted at the Michigan Wheat Program’s summer research field day on June 16, 2017.

**Research Study 2:** Conduct preliminary research on roughstalk bluegrass control in wheat.

**Procedures:** ‘Jupiter’ soft white winter wheat was drilled in 7.5-inch rows at a rate of 1.8 million seeds/A on September 14, 2016 near Deckerville, MI. Each plot measured 10 feet by 25 feet and treatments were replicated four times. Four different grass herbicides were applied on April 11 when wheat was a Feekes stage 5 and roughstalk bluegrass was 1-2 inches tall. Herbicides included: Osprey, PowerFlex HL, Axial XL, and Olympus. Olympus is not currently registered for use in Michigan. Herbicide treatments were compared to an untreated control and were evaluated for wheat injury and roughstalk bluegrass control.

**Results and observations:**

- Wheat injury was greatest from Osprey (~10%), 14 DAT. By 21 DAT wheat injury was negligible.
- Roughstalk bluegrass control was slow. By 21 DAT, roughstalk bluegrass control ranged from 46 to 61% with Axial XL, Osprey, and PowerFlex HL. Control with Olympus was only 18%.
- It took at least 30 DAT for maximum roughstalk bluegrass control with the different herbicide treatments.
- By the end of the season, Osprey, PowerFlex HL and Axial XL all provided similar control (>95%) of roughstalk bluegrass.
- Recommendations based on our preliminary results are PowerFlex HL (2 oz/A), Osprey (4.75 oz/A), or Axial XL (16.4 fl oz/A) applied in the spring can be used to control 1-2” roughstalk bluegrass.

Since roughstalk bluegrass is a relatively new weed in Michigan wheat we are proposing to conduct further studies to understand the biology and management of this weed.

**Wheat Industry Benefits:**

This research has been used and will continue to be used to refine and develop weed control recommendations that are important to Michigan winter wheat growers. Results from this research are used to refine and develop fact sheets, added to the MSU Weed Control Guide for Field Crops (E-434), presented at extension meetings, and posted on www.MSUweeds.com.