Michigan Wheat Program Final Report
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Title: *Preharvest herbicide application effects on wheat harvestability* (FY16)

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PROBLEM STATEMENT

Weeds continue to be common place in many winter wheat fields at harvest. These weeds present at harvest can lead to issues with harvesting as 'green' weed tissue plug up many machines and caused dockages at the point of sale. One way that may help to combat these issues is with the use of harvest aids or preharvest herbicide treatments.

Currently, there are four different herbicides registered for use as harvest aids in winter wheat. These harvest aids are applied to desiccate or suppress weeds that can hinder harvest. They will not increase yield. While harvest aids are not preferred way to help manage weeds, in years with high numbers of weeds at harvest they may help aiding in harvesting winter wheat. Glyphosate (i.e., Roundup PowerMax), 2,4-D amine/ester, Aim (carfentrazone), and Clarity (dicamba) are all choices that Michigan growers have that can be used as harvest aids. There has also been some talk that an additional herbicide, Sharpen (saflufenacil) may also get a registration in the near future. Each of these herbicides have different restrictions that need to be considered. There has also been some concerns with the potential for glyphosate residues from these treatments, depending on application timing. While many of these herbicides are registered for preharvest applications there is not a lot of information or research on how these applications effect weed desiccation and ultimately wheat harvestability, yield, and various other factors.

Objective:

Compare various winter wheat preharvest herbicide treatments for weed desiccation and effects on wheat.

Procedures:

'Sunburst' soft red winter wheat was drilled in 7.5-inch rows at a rate of 1.8 million seeds/A on October 26, 2015 at Michigan State University campus in East Lansing. Each plot measured 10 feet by 30 feet. As the 2016 season played out there were very few weeds at wheat harvest at the research farms and in several growers fields, so we decided to continue with the trial and really examine what effects the different preharvest treatments were having on grain moisture, yield, test weight, seed germination, etc. Three additional treatments were added to our initial trial to also determine the effect of glyphosate application timing and rate on glyphosate residues in the wheat crop. Preharvest herbicide treatments of Roundup PowerMax at 22 fl oz/A and 44 fl oz/A were applied at an early application timing when grain moisture was 39% on July 5. The preharvest herbicide treatments listed in Table 1 were applied on July 11 when grain moisture was 17.6%. There was total of 12 treatments (including two control plots) and all plots were replicated 4 times.

Table 1. Herbicide treatments applied to soft red winter wheat.

	Herbicide treatment	Rate	Additives
1	Clarity	8 fl oz/A	
2	2,4-D amine	1 pt/A	
3	Aim	1.5 fl oz/A	MSO
4	Sharpen	2 fl oz/A	MSO + AMS
5	Roundup PowerMax	22 fl oz/A & 44 fl oz/A	AMS
6	Roundup PowerMax + Sharpen	22 fl oz/A + 2 fl oz/A	MSO + AMS
7	Roundup PowerMax + Aim	22 fl oz/A + 1.5 fl oz/A	MSO + AMS
8	Untreated		

Wheat yield was recorded and samples from each plot were collected to measure grain moisture, test weight, weight of 100 seeds and wheat seed viability. Seed was sent in for glyphosate residue testing from the early and standard application timing treatments of Roundup PowerMax at 22 fl oz/A and 44 fl oz/A.

Results and observations:

- Similar to 2015 there were no differences in yield in 2016 with any of the preharvest treatments examined compared with the untreated control plots.
- Test weight and seed moisture were not different from the control plots, regardless of application timing or herbicide treatment. In 2015, when weeds were present we did observe more favorable test weight and seed moisture when Roundup PowerMax was applied.
- Weight per 100 seeds and seed germination were not different from the control plots, indicating that if doesn't look like preharvest applications affected grain quality.
- Treatments with Roundup PowerMax or Sharpen alone provided excellent control of common ragweed that was below the wheat canopy.
- Glyphosate residues were well below the MRLs established for cereal grains from the glyphosate only treatments.

Over the past two years, we have seed some definite differences in the preharvest treatments, in regards to weed desiccation. We have also observed differences in wheat harvestability when there are weeds at harvest for the wheat crop. Yield has not been affected by the preharvest treatments, whether weeds are present or not. Due to the warmer fall that helped with wheat establishment and the drier than normal season, many fields including our plots did not have large weeds above the wheat canopy. We are proposing to repeat this experiment for an additional year, with the inclusion of some of the additional glyphosate treatments that we examined in 2016. The more experience that we have with these harvest aids the more confident we can be with our recommendations to growers

Wheat Industry Benefits:

This research will be used to develop recommendations on preharvest herbicide treatments that are important to Michigan winter wheat growers. Applying preharvest herbicide treatments to fields with poor weed control will dry down weeds prior to harvest improving harvestability and reduce grain dockages.