

Michigan Wheat Program Final Report

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Title: Investigating common windgrass management systems in winter wheat

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Problem Statement:

Common windgrass (*Aperia spica-venti* L.) is a winter annual grass species that has become more of a weed problem in winter wheat production in Michigan. In the past, the distribution of this weed has been somewhat limited to Huron and Sanilac counties. However, over the last several years this weed has been reported in several other Michigan counties. Difficulty in management of this weed has been due to its emergence pattern that closely coincides with winter wheat emergence, growth that is similar to winter wheat, and the limited availability of selective herbicides.

Prior to the mid-90s there were no chemical control options available in the United States to manage this weed. Research from around this time determined that post-plant incorporated Treflan (trifluralin) provided some control of this weed, but incorporation and planting depth had to be managed closely and control often did not exceed 85%. Since this time a common practice used in the thumb area to manage common windgrass has been to apply Treflan preemergence. One of the issues with this strategy is that incorporation is generally critical so Treflan does not photodegrade and lose effectiveness. As mentioned earlier, incorporation of Treflan needs to be managed closely. If the herbicide is too close in proximity to the seed, wheat can be significantly damaged. The extra step of incorporation and chance for wheat injury are reasons why growers do not follow the traditional recommendations. More recently, there has been some additional selective grass herbicides registered for weed control in winter wheat. Some of these herbicides have been used for common windgrass control, however the timing of application and comparisons of the effectiveness of the different products have not been evaluated. Additionally, there have been some new registrations of herbicides that have not been examined for windgrass control in Michigan or other states.

Objective:

- 1) Evaluate various herbicide programs for control of common windgrass in winter wheat.

Procedures:

'Ambassador' soft white winter wheat was drilled in 7.5-inch rows on September 27, 2012 in a field with a known heavy population of common windgrass in Minden City, MI. The plot area was staked for 20 herbicide treatments replicated four times. Each plot measured 10 x 25 ft. The different herbicide treatments for the study are presented in Table 1. An untreated plot was left as a control.

Immediate after planting, the four preemergence (PRE) treatments were applied. Prowl H₂O was applied at this time even though it is only labeled after wheat has emerged. This was to determine the full extent of common windgrass control of Prowl since it does not control

emerged weeds. On November 5, approximately one month after planting, the fall POST treatments were applied. Wheat was 4-inches tall and was at Feeke's stage 2. Common windgrass was 0.25-0.5 inches tall and had 1-2 leaves. On May 9, 2013, when wheat was at Feeke's stage 4 and 6-inches tall the spring POST treatments were applied. Common windgrass was 0.5-5 inches tall, averaging 3-inches tall with 5 leaves.

Table 1. Herbicide treatments examined for common windgrass control.

Preemergence	Fall (POST)	Spring (POST)
Zidua (1.5 oz)^a	PowerFlex HL (2 oz) ^c	PowerFlex HL (2 oz) ^c
Zidua (3 oz)	Osprey (4.75 oz) ^c	Osprey (4.75 oz) ^c
Treflan (1 pt)	Axial XL (16.4 fl oz)	Axial XL (16.4 fl oz)
Prowl H₂O (2 pt)^b	Puma (10.6 fl oz)	Axial Star (16.4 fl oz)
	PowerFlex HL + Huskie ^c	Puma (10.6 fl oz)
	Osprey + Huskie ^c	PowerFlex HL + Huskie ^c
		Osprey + Huskie ^c
		PowerFlex HL + Affinity BroadSpec ^c
		Osprey + Affinity BroadSpec ^c

^a Zidua is currently not labeled for use in winter wheat.

^b Prowl H₂O is labeled for use once wheat has one leaf (Feeke's stage 1).

^c Treatments were applied with 0.25% v/v NIS for PowerFlex and 0.5% v/v NIS for Osprey and all treatments contained 2 lbs/A of AMS.

Common windgrass control was evaluated throughout the season. The last evaluation was made on July 3 approximately two weeks prior to harvest. All data were analyzed for differences in control.

Results and observations:

- The common windgrass population at this location was extremely high, averaging 65 plants per ft².
- *Preemergence applications:*
 - Zidua applied PRE needed to be at the 3 oz/A rate for windgrass control (80%), however there was some crop response from this treatment.
 - The standard of Treflan PRE provided little control (<10%) and control with Prowl H₂O PRE was not much better.
- *Fall POST applications:*
 - PowerFlex HL and Osprey applied in the fall provided excellent end of season control of common windgrass, 97 and 87%, respectively.
 - Tank-mixing these products with Huskie did not affect common windgrass control.
 - Fall applications of Puma and Axial XL provided poor control of common windgrass.
- *Spring POST applications:*
 - PowerFlex HL and Osprey provided excellent end of season control of common windgrass >97% from spring applications.
 - Tank-mixtures with Huskie or Affinity BroadSpec did not reduce common windgrass control.

- Axial XL and Axial Star provided around 85% common windgrass control from spring applications.
- Common windgrass control from Puma applied in the spring was only about 50%.
- *Fall vs. Spring applications:*
 - Spring applications of PowerFlex HL and Osprey were slow at controlling common windgrass (>1 month). This may impact yield??
 - Fall applications of PowerFlex HL and Osprey were clean throughout the season.
 - Fall applications of any of the herbicides did not help in controlling summer annual weeds like common lambsquarters and common ragweed. Spring herbicide applications would be needed to control these weeds.

Wheat Industry Benefits:

This research was essential in developing recommendations for control of common windgrass in Michigan winter wheat. This weed has been a devastating weed in winter wheat thumb growing region and is showing up in more areas of Michigan. This information will be added to the 2014 MSU Weed Control Guide for Field Crops and a fact sheet on common windgrass identification and control will be completed by wheat planting this fall and available at MSUWeeds.com. These recommendations are essential for maintaining winter wheat yield and quality in Michigan.