

CONTROL OF PROBLEM WEEDS IN SMALL GRAINS

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Key Findings

- Control of annual bluegrass control was observed with Zidua applied at spike stage of the wheat, or Maverick, Osprey, or PowerFlex applied to small plants (less than 1.5 inches)
- Metribuzin was the only product to consistently control ivyleaf speedwell. Finesse and PowerFlex has provided control in field trials; but only provided suppression in greenhouse trials.
- Metribuzin and Quelex provided excellent control of ALS-resistant common chickweed (>94% control) with Harmony Extra plus Starane providing 84% control.

Annual bluegrass

Annual bluegrass control was evaluated under no-till conditions (Table 1). Plots either received a glyphosate application at planting (to control the initial flush of annual bluegrass) or no glyphosate application. Zidua plus Sharpen was used as the wheat began to emerge. Osprey, Maverick, or PowerFlex were applied to wheat at the 3-leaf stage (3 weeks after planting [Nov 11]) and PowerFlex was applied in the spring (March 17).

Zidua provided excellent annual bluegrass control as well as fall applications of Maverick, Osprey, or PowerFlex following glyphosate as a burndown. This indicates that all of these products need to be applied to small annual bluegrass plants in order to be effective.

Wheat stunting, rated on December 16, was less than 10% for all treatments (which is not observed unless an untreated check is included). No significant differences in yields were observed.

Table 1. Wheat stunting on December 16, 2015 and annual bluegrass control rated on April 29, 2016, with at planting or postemergence treatments. Herbicide treatments were applied with and without use of glyphosate at planting. Values followed by the same letter are not significantly different from one another.

Treatment name	Product	Rate	Adjuvants	Timing	Wheat stunting	Annual bluegrass control (%)	Yield bu/A
No burndown							
Untreated					0 a	0 d	43 a
Zidua + Sharpen	1.25 oz wt/a + 4 fl oz/a			Spike	6 a	85 a	49 a
PowerFlex	2 oz wt/a		NIS + AMS	3-lvs	8 a	43 c	45 a
Maverick	0.67 oz wt/a		NIS + N	3-lvs	6 a	73 ab	47 a
Osprey	4.75 oz wt/a		NIS + N	3-lvs	10 a	54 bc	48 a
PowerFlex	2 oz wt/a		NIS + AMS	Spring	-	50 bc	47 a
Glyphosate applied as burndown							
Untreated					0 a	55 bc	41 a
Zidua + Sharpen	1.25 oz wt/a + 4 fl oz/a			Spike	9 a	100 a	50 a
PowerFlex	2 oz wt/a		NIS + AMS	3-lvs	2 a	85 a	47 a
Maverick	0.67 oz wt/a		NIS + N	3-lvs	6 a	88 a	47 a
Osprey	4.75 oz wt/a		NIS + N	3-lvs	9 a	95 a	46 a
PowerFlex	2 oz wt/a		NIS + AMS	Spring	-	57 bc	50 a
LSD (P=.05)					7.4	18.1	5.5
CV					69.5	16.2	6.8
Treatment	Prob(F)				0.1683	0.0001	0.1074

Adjuvant: AMS= dry ammonium sulfate; N= liquid UAN; NIS= non-ionic surfactant.

Ivyleaf speedwell

Ivyleaf speedwell control was evaluated on a field planted with cereal rye. Due to early termination of the rye, only fall treatments were included. Treatments were applied on November 16, 2015 and included Glory, Huskie, Huskie + Glory, Finesse, PowerFlex, Osprey, Harmony Extra, Quelex, Osprey + Clarity, and Osprey + 2,4-D (Table 2).

Treatments with Glory, Finesse, PowerFlex, and Osprey with either 2,4-D or Clarity the highest level of ivyleaf speedwell control. No other treatment provided acceptable level of control.

Table 2. Control ratings for ivyleaf speedwell treated in the fall of 2015. Values followed by the same letter are not significantly different from one another.

Treatment Name	Product	Rate	Adjuvants	Ivyleaf speedwell % Control 12/16/2015
Untreated Check				0
Glory	3 oz wt/a		NIS	83 a
Huskie	15 fl oz/a		AMS	33 c
Huskie + Glory	15 fl oz/a + 3 oz wt/a		NIS	80 a
Finesse	0.4 oz wt/a		NIS + N	68 ab
PowerFlex	2 oz wt/a		NIS + N	77 a
Osprey	4.75 oz wt/a		NIS + N	37 c
Harmony Extra	0.75 oz wt/a		NIS + N	53 b
Quelex	0.75 oz wt/a		NIS + N	53 b
Osprey + Clarity	4.75 oz wt/a + 4 fl oz/a		NIS + N	73 a
Osprey + 2,4-D	4.75 oz wt/a + 8 fl oz/a		NIS + N	72 a
LSD (P=.05)				15.1
CV				15.8
Treatment Prob(F)				0.0001

Adjuvant: AMS= dry ammonium sulfate; N= liquid UAN; NIS= non-ionic surfactant.

The field trial had high level of variability (CV of 15.8%), so a greenhouse trial was conducted. The greenhouse trial included Clarity, Finesse, Glory, Harmony Extra, Huskie, Osprey, PowerFlex, Quelex, and 2,4-D, alone and in combinations (Table 3). Adjuvants were included and applications were made at 1/3 and 2/3 the normal use rates to better separate treatment differences.

The only treatment to provide over 85% control was Glory and all other treatments were less than 65% control. The reduction of plant biomass is consistent with the visual control data. The Finesse and PowerFlex treatments did not reflect what was observed in the field; and in a previous field trial Finesse provided 70% control with either a fall or spring application. This may have been due to a number of reasons such as rate, observation time and/or lack of stress on the speedwell plants. In the greenhouse, the reduced rates have been too low for effective control. Both are slow acting herbicides and termination at 4WAP may not have been long enough time for full effect to be observed. The other factor is that weeds in the greenhouse were grown without the presence of wheat and were not

subjected to temperature fluctuations, and this may have allowed ivyleaf speedwell to remain growing. More observations are needed to confirm the consistency of Finesse and PowerFlex effectiveness.

Table 3. Control of ivyleaf speedwell, based on greenhouse trial. Control ratings averaged over 1/3 and 2/3X rates. Values followed by the same letter are not significantly different from one another.

Herb	1X Rate	Adjuvant	Control (%)	Reduction in biomass (% of UTC)
Huskie	13 fl oz	AMS	29 d	7 a
Osprey	4.8 oz wt	NIS + N	30 d	12 a
Harmony Extra	0.75 oz wt	NIS + N	38 d	14 ab
Quelex	0.75 oz wt	NIS + N	50 c	30 bc
Harmony Extra + Clarity	0.75 oz wt + 4 fl oz	NIS + N	51 c	19 ab
Harmony Extra + 2,4-D	0.75 oz wt + 8 fl oz	NIS + N	54 bc	15 ab
PowerFlex	2 oz wt	NIS + N	61 bc	46 c
Finesse	0.3 oz wt	NIS + N	65 b	44 c
Huskie + Glory	13 fl oz + 3 oz wt	NIS	85 a	69 d
Glory	3 oz wt	NIS	90 a	74 d

Adjuvant: AMS= dry ammonium sulfate; N= liquid UAN; NIS= non-ionic surfactant.

ALS-resistant Common Chickweed

A field demonstration of various herbicides for control of ALS-resistant common chickweed was conducted in commercial field in Kent County. Treatments are listed in Table 4. All treatments containing Glory or Quelex provided at least 94% control. Harmony Extra plus Starane Ultra provided 84% control. The addition of 2,4-D to Huskie did not improve the control of common chickweed, indicating its lack of effectiveness on this species.

Table 4. Control of ALS-resistant common chickweed. All treatments were applied in the spring of 2016. Values followed by the same letter are not significantly different from one another.

Treatment Name	Product	Rate	Adjuvants	Common chickweed % control 5/4/2016
Untreated Check				0
Glory	3	oz wt/a	NIS	98 a
Glory	4	oz wt/a	NIS	99 a
Huskie	15	fl oz/a	NIS + AMS	70 c
Huskie + Glory	15 + 4	fl oz/a oz wt/a	NIS + AMS	99 a
Huskie + 2,4-D	15 + 10.5	fl oz/a fl oz/a	NIS + AMS	68 c
Quelex	0.75	oz wt/a	NIS + N	94 a
Quelex + Glory	0.75 4	oz wt/a oz wt/a	NIS + N	99 a
Quelex + 2,4-D	0.75 10.5	oz wt/a fl oz/a	NIS + N	99 a
Harmony Extra + Starane Ultra	0.75 6	oz wt/a fl oz/a	NIS + N	84 b
LSD (P=.05)				6.2
CV				4.0
Treatment Prob(F)				0.0001

Surfactant: AMS= dry ammonium sulfate; N= liquid UAN; NIS= non-ionic surfactant.

Summary

Control of annual bluegrass control was observed with Zidua applied at spike stage of the wheat, or Maverick, Osprey, or PowerFlex applied to small plants (less than 1.5 inches)

Metribuzin was the only product to consistently control ivyleaf speedwell. Finesse and PowerFlex has provided control in field trials; but only provided suppression in greenhouse trials.

Metribuzin and Quelex provided excellent control of ALS-resistant common chickweed (>94% control) with Harmony Extra plus Starane providing 84% control.

These on-farm trials have increased our experience for management of these important weeds in Delaware. In our survey of small grain fields in 2013 through 2016, common chickweed was one of the most frequently observed species, annual bluegrass was the most common grass species, and ivyleaf speedwell was in about one-third of the fields. Additional work is necessary to understand the consistency of these results; we seldom rely on a single trial for weed control recommendations.