

## **WEED SURVEY AND CONTROL OF KEY WEED SPECIES IN SMALL GRAINS – 2013/2014**

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### **Weed Survey**

As part of the project we surveyed small grain fields for weeds, identifying them by species and relative abundance. In the fall samples, henbit was the most common species observed, it was in 16 of the 17 fields we surveyed. Henbit density ranged 400 plants/m<sup>2</sup> to a few random plants. No other weed species was found at such high densities. Common chickweed was present in 13 fields. Ivyleaf speedwell was found in 7 fields, and 6 fields had field pansy (johnny jumpup). Five fields had mouseear cress or common groundsel. The only grass species encountered were annual bluegrass (in three fields) and two fields had annual ryegrass present.

The average field had five species present in the field. One field had 13 species present, while eleven fields had 5 or fewer species present. We did not test to determine if any of the fields were infested with herbicide-resistant biotypes.

We surveyed again in the spring of 2014, which included eleven fields surveyed the previous fall and six new fields. It appeared all fields had been treated with a herbicide prior to our observations. Henbit and ivyleaf speedwell were the two most common species, identified in 12 and 10 fields, respectively. Common chickweed was observed in six fields and no other species was present in more than four fields. Weed density was dramatically lower than the fall surveys, with only two fields having densities we might suspect yield loss to occur. One was a barley field that had an annual bluegrass infestation, and there are no products labeled for postemergence annual bluegrass control in barley. The second field was infested with ALS-resistant common chickweed and there were patches with heavy densities that may have impacted yield.

The average field had just under 3 species present, and no field had more than 6 species observed.

One noteworthy observation, more fields had annual bluegrass in the spring survey (10 fields) than the fall survey (3 fields). The increase in number of fields with annual bluegrass may be due to size of the plants and they were present, but not observed in the fall.

While this survey is a good starting point for occurrences of common weed species, the data set is not large enough to try to associate weed species with certain field characteristics. The survey will continue during the 2014/2015 season.

### **On-Farm Trials**

We conducted four replicated on-farm trials as a result of our surveys. The trials were based on specific weed management issues we encountered.

#### Henbit Control

A trial on henbit control in winter wheat was conducted near Millsboro, DE. Harmony Extra, Harmony plus Starane Ultra, Huskie, Express, or Glory (metribuzin) were applied either in the fall or spring. Applications were made Nov 14 or April 1. Henbit control was >85% for all treatments except Harmony Extra, Glory, or Express in the fall. These three products provided over 90% control when applied in the spring. This is not consistent with the general trend from other trials with better weed control with fall herbicide applications than spring applications. Common chickweed control was >98% for all treatments except Huskie in the spring. Mouseear chickweed was poor with Huskie, regardless of application timing.

Trt No.	Treatment Name	Product	Rate	Appl Code	Henbit Control		Mouseear Chickwd Control		Common Chickwd Control	
					%		%		%	
1	Harmony Extra SG	0.9	oz wt/a	Fall	71	d	100	a	100	a
	30% UAN	2	qt/a	Fall						
	Nonionic Surf.	1	qt/100 gal	Fall						
2	Starane Ultra	6.4	fl oz/a	Fall	88	ab	83	ab	100	a
	Harmony Extra SG	0.9	oz wt/a	Fall						
	30% UAN	2	qt/a	Fall						
	Nonionic Surf.	1	qt/100 gal	Fall						
3	Huskie	11	fl oz/a	Fall	91	a	50	c	100	a
	30% UAN	2	qt/a	Fall						
4	Express TS	0.5	oz wt/a	Fall	78	bcd	100	a	100	a
	30% UAN	2	qt/a	Fall						
	Nonionic Surf.	1	qt/100 gal	Fall						
5	GLORY...Metribuzin	4	oz wt/a	Fall	75	cd	100	a	93	a
	Nonionic Surf.	1	qt/100 gal	Fall						
6	Harmony Extra SG	0.9	oz wt/a	Spr	90	ab	90	ab	98	a
	30% UAN	2	qt/a	Spr						
	Nonionic Surf.	1	qt/100 gal	Spr						
7	Starane Ultra	6.4	fl oz/a	Spr	86	abc	90	ab	91	a
	Harmony Extra SG	0.9	oz wt/a	Spr						
	30% UAN	2	qt/a	Spr						
	Nonionic Surf.	1	qt/100 gal	Spr						
8	Huskie	11	fl oz/a	Spr	88	ab	58	bc	75	b
	30% UAN	2	qt/a	Spr						
9	Express TS	0.5	oz wt/a	Spr	90	ab	84	ab	100	a
	30% UAN	2	qt/a	Spr						
	Nonionic Surf.	1	qt/100 gal	Spr						

10	GLORY...Metribuzin Nonionic Surf.	4 1	oz wt/a qt/100 gal	Spr Spr	91 a	70 abc	100 a
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LSD (P=.05)	12.57	32.79	12.68
CV	8.64	23.05	7.72
Treatment Prob(F)	0.0197	0.0411	0.0114

Means followed by same letter do not significantly differ  
(P=.05, LSD)

### Ivyleaf Speedwell Control

A trial on ivyleaf speedwell control in winter barley was conducted near Magnolia, DE. Harmony Extra, Harmony plus Glory (metribuzin), Starane Ultra, Huskie, Huskie plus Glory, Express, Finesse or Glory were applied either in the fall or spring. Applications were made Nov 22 or April 2. Some products were applied at more than one rate (see table below). Ivyleaf speedwell control was best with Glory; no other herbicide provided acceptable control. Henbit control was >86% for all treatments except Harmony Extra or Starane Ultra. Unlike the Millsboro location, henbit control with Glory did not differ between fall and spring application timings.

Trt No.	Treatment Name	Product	Rate	Appl Code	Ivyleaf Speedwll Control	Ivyleaf Speedwll Control	Henbit Control	Henbit Control
					% 4/9/2014	% 5/15/2014	% 4/9/2014	% 5/15/2014
1	Untreated Check				0	0	0	0
2	Starane Ultra	6.4	fl oz/a	Fall	57 bc	43 d	55 b	37 c
3	Glory Nonionic Surf.	3 0.25	oz wt/a %	Fall Fall	98 a	98 a	97 a	95 a
4	Glory Nonionic Surf.	4 0.25	oz wt/a %	Fall Fall	100 a	92 ab	100 a	100 a
5	Huskie Ammonium Sulf.	15 0.5	fl oz/a lb/a	Fall Fall	60 bc	47 d	97 a	90 a
6	Huskie Glory Nonionic Surf.	15 3 0.25	fl oz/a oz wt/a %	Fall Fall Fall	100 a	95 a	100 a	87 a
7	Harmony Extra Nonionic Surf. 30% UAN	0.75 0.25 1	oz wt/a % %	Fall Fall Fall	53 c	23 e	50 b	53 b
8	Finesse Nonionic Surf. 30% UAN	0.2 0.25 1	oz wt/a % %	Fall Fall Fall	57 bc	70 c	100 a	100 a

9	Finesse	0.4	oz wt/a	Fall	67 b	73 bc	100 a	100 a
	Nonionic Surf.	0.25	%	Fall				
	30% UAN	1	%	Fall				
10	Glory	4	oz wt/a	Spr		92 ab		100 a
	Nonionic Surf.	0.25	%	Spr				
11	Huskie	15	fl oz/a	Spr		55 cd		100 a
	Ammonium Sulf.	0.5	lb/a	Spr				
12	Huskie	15	fl oz/a	Spr		100 a		100 a
	Glory	3	oz wt/a	Spr				
	Nonionic Surf.	0.25	%	Spr				
13	Finesse	0.4	oz wt/a	Spr		72 c		100 a
	Nonionic Surf.	0.25	%	Spr				
	30% UAN	1	%	Spr				
14	Glory	3	oz wt/a	Spr		97 a		98 a
	Nonionic Surf.	0.25	%	Spr				
LSD (P=.05)					11.64	19.73	7.04	14.81
CV					8.99	15.9	4.49	9.77
Treatment Prob(F)					0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ  
(P=.05, LSD)

#### Control of ALS-resistant Common Chickweed

Two trial on ALS-resistant common chickweed control in winter wheat were conducted near Felton, DE.

The first trial examined Axiom applied at the spike stage of the wheat, followed by Huskie alone or with Osprey or metribuzin (Glory). Postemergence applications were made in the fall (Nov 22) or spring (April 2). Common chickweed control was similar for all treatments, except spring applications of Huskie plus Osprey. Axiom applied at the spike stage followed by Huskie plus Osprey applied in the spring improved chickweed control. All treatments provided excellent henbit control at this site.

Trt No.	Treatment Name	Product	Rate	Appl Code	Common Chickwd Control	Common Chickwd Control	Henbit Control	Henbit Control
					% 4/2/2014	% 5/2/2014	% 4/2/2014	% 5/2/2014
1	Untreat Check				0	0	0	0
2	Axiom	6	oz wt/a	spike	73 c	89 a	100 a	100 a
	Huskie	15	fl oz/a	Spr				
	AMS	0.5	lb/a	Spr				
3	Axiom	6	oz wt/a	spike	75 c	93 a	95 a	100 a
	Huskie	15	fl oz/a	Spr				
	Osprey	4.76	oz wt/a	Spr				
	Nonionic Surf.	0.5	%	Spr				

	30% UAN	2	qt/a	Spr				
4	Huskie	15	fl oz/a	Spr	-	74 b	-	100 a
	Osprey	4.76	oz wt/a	Spr				
	Nonionic Surf.	0.5	%	Spr				
	30% UAN	2	qt/a	Spr				
5	Huskie	15	fl oz/a	Fall	87 b	89 a	100 a	98 a
	AMS	0.5	lb/a	Fall				
6	Huskie	15	fl oz/a	Fall	100 a	97 a	100 a	100 a
	Metribuzin	3	oz wt/a	Fall				
	Nonionic Surf.	0.5	%	Fall				
LSD (P=.05)					7.09	8.01	7.29	2.43
CV					5.62	4.81	4.9	1.3
Treatment Prob(F)					0.0001	0.0018	0.0001	0.4609

The second trial examined various tankmix partners with Harmony Extra to control ALS-resistant chickweed. Postemergence applications were made Nov 22 or April 2. ALS-R common chickweed control was poor for treatments of Harmony Extra, Harmony plus Express, since these treatments only contain ALS (Group 2) herbicides. All treatments with Glory (metribuzin) provided at least 96% control, regardless of application timing. Common chickweed control/suppression with Starane Ultra was dependent on the rate, but even at the highest rate, control was only 80%.

Trt No.	Treatment Name	Product	Rate	Appl Code	Common Chickwd Control % 5/2/2014
1	Harmony Extra	0.75	oz wt/a	Fall	40 d
	Nonionic Surf.	1	qt/100 gal	Fall	
2	Harmony Extra	0.75	oz wt/a	Fall	96 a
	Metribuzin	2	oz wt/a	Fall	
	Nonionic Surf.	1	qt/100 gal	Fall	
3	Harmony Extra	0.75	oz wt/a	Fall	99 a
	Metribuzin	4	oz wt/a	Fall	
	Nonionic Surf.	1	qt/100 gal	Fall	
4	Harmony Extra	0.75	oz wt/a	Fall	58 c
	Starane Ultra	0.25	pt/a	Fall	
	Nonionic Surf.	1	qt/100 gal	Fall	
5	Harmony XP	0.33	oz wt/a	Spring	40 d
	Express XP	0.167	oz wt/a	Spring	
	Nonionic Surf.	1	qt/100 gal	Spring	
6	Harmony XP	0.33	oz wt/a	Spring	97 a
	Express XP	0.167	oz wt/a	Spring	
	Metribuzin	2	oz wt/a	Spring	
	Nonionic Surf.	1	qt/100 gal	Spring	

7	Harmony XP	0.33	oz wt/a	Spring	100 a
	Express XP	0.167	oz wt/a	Spring	
	Metribuzin	4	oz wt/a	Spring	
	Nonionic Surf.	1	qt/100 gal	Spring	
8	Harmony XP	0.33	oz wt/a	Spring	100 a
	Express XP	0.167	oz wt/a	Spring	
	Metribuzin	6	oz wt/a	Spring	
	Nonionic Surf.	1	qt/100 gal	Spring	
9	Harmony XP	0.33	oz wt/a	Spring	68 bc
	Express XP	0.167	oz wt/a	Spring	
	Starane Ultra	0.3	pt/a	Spring	
	Nonionic Surf.	1	qt/100 gal	Spring	
10	Harmony XP	0.33	oz wt/a	Spring	79 b
	Express XP	0.167	oz wt/a	Spring	
	Starane Ultra	0.3	pt/a	Spring	
	MCPA ESTER 4	1	pt/a	Spring	
	Nonionic Surf.	1	qt/100 gal	Spring	
11	Harmony XP	0.33	oz wt/a	Spring	80 b
	Express XP	0.167	oz wt/a	Spring	
	Starane Ultra	0.4	pt/a	Spring	
	Nonionic Surf.	1	qt/100 gal	Spring	
12	Untreated Check				0
LSD (P=.05)					12.78
CV					9.6
Treatment Prob(F)					0.0001

Means followed by same letter do not significantly differ (P=.05, LSD)

The on-farm trials have increased our experience for management of these important weed species in DE. Additional work is necessary to understand the consistency of these results and improve our recommendations. We seldom rely on a single trial for weed control recommendations.

While Glory (metribuzin) was effective for control in many of these trials, we know some varieties are sensitive to this herbicide and we need more work on crop safety to understand the safest rates and timing to use. Overall, spring applications of Glory provided better crop safety than fall applications.