MANAGING GIANT RAGWEED & MARESTAIL IN WHEAT

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INTRODUCTION

Giant ragweed and marestail are examples of weeds that emerge in wheat. While they may sometimes interfere with wheat harvest, the greatest concern is their impact on double-crop soybeans following wheat harvest. Marestail is especially difficult to control since most populations are tolerant to glyphosate.

Limited observations indicate such management practices as a competitive stand of wheat may aid in the control of weeds that later become a problem in soybeans. It is also believed some of the herbicides used to control cool-season weeds in wheat may improve control of other weeds that occur in soybeans.

OBJECTIVE

This research is a part of a long-term project to evaluate the effect of seeding rate of wheat and certain wheat herbicides on managing giant ragweed and marestail.

RESEARCH METHODS

Trials were conducted during 2009-2010 and 2010-2011 growing seasons on giant ragweed and marestail in wheat as separate experiments at the University of Kentucky Research and Education Center. Studies focused on the effect of wheat seeding rate and herbicides on controlling these two species.

Seeding Rate Experiments: These studies evaluated the effect of seeding rate of wheat on the heights and number of giant ragweed and marestail plants in early June. Wheat was seeded at the X and ½ X rate and compared with winter fallow plots with no wheat. The X seeding rate ranged from 31 to 40 seed/ft^2; whereas, the ½ X rate was 17 or 18 seed/ ft^2. Giant ragweed and marestail plant counts were determined in four areas of each plot on in early June. A quadrate (4 or 9 ft^2) was used to quantify weed density from four random areas within each fallow plot (i.e. 0 seeding rate). Data from the wheat plots were taken the full length of each plot from skip rows on the left and right side of each plot and from rows from the left and right side of the area to be harvested.

The skip rows were included to simulate an open canopy effect similar to that caused by tramlines. During the planting process, the drill units adjacent to the outside rows were blocked in order to create the skip rows. Only one unit on each side of the drill was blocked in the 2009-2010 studies. However, in order to more accurately reflect the tramline effect, two units were blocked on each side of the drill in the 2010-2011 studies.

In order to compare data between the different sampling areas, the densities were based on plants per 100 ft^2. Heights of marestail and giant ragweed were measured for up to six plants from each sampling area.

Herbicide Experiments: The effect of certain herbicides used in wheat was another component of this research. Preharvest treatments of glyphosate or tank mixes of glyphosate plus 2,4-D were evaluated the first season. The treatments in the second season focused on treatments applied in the fall or spring and varied depending on weed species. The herbicides included Valor (flumioxazin), Finesse (chlorsulfuron + metsulfuron), Peak (prosulfuron), Huskie (bromoxynil +

pyrasulfotole), and combinations of Huskie with Harmony Extra (thifensulfuron + tribenuron), Clarity (dicamba) and 2,4-D ester.

RESULTS

Seeding Rate Experiments: Data for the seeding rate studies for giant ragweed and marestail are reported in tables 1 and 2, respectively for both growing seasons. In most instances there tended to be fewer giant ragweed and marestail plants in the X rate compared with the ½ X rate and in the case of marestail. In 2010, the difference was statistically significant. In 2011 the density of giant ragweed in the X seeding rate was numerically greater than that for the ½ X rate, however the difference was not statistically significant.

In all instances, both giant ragweed and marestail were numerically shorter in the X seeding rate than the ½ X seeding rate. However, the only cases where the differences were statistically significant were in 2010 for giant ragweed plants in the skip and harvest rows and in 2011 for marestail plants in the skip row.

Having wheat as a vegetative winter cover did significantly limit the number of giant ragweed and marestail plants both years when compared with the fallow plots. In all instances, the surviving giant ragweed and marestail plants were numerically shorter in wheat compared with the fallow plots. The only situations where the differences in plant heights were not statistically significant were for marestail in both skip and harvest rows in 2010.

Although statistical analysis for comparing skip rows to harvest rows were not made, there were some interesting trends observed. The density and heights of giant ragweed and marestail were usually numerically less in the harvest rows than in the skip rows. Exceptions occurred in 2010, where plant heights were numerically greater in the harvest row than the skip row for giant ragweed at the ½ X seeding rate and for marestail for both X and ½ X seeding rates.

Wheat head counts and grain yields are reported in table 2. The number of heads and yield of the wheat in the X seeding rate were often numerically greater than those in the ½ X rate, but rarely was this difference statistically significant. Wheat yield also tended to be numerically greater for the X seeding rate than the ½ X seeding rate.

Herbicide Experiments: It was difficult to assess the impact of preharvest herbicide treatments on giant ragweed and marestail due to dry weather after wheat harvest in the 2009-2010 studies (data not shown). A slight improvement in control appeared to occur in some instances with herbicides. The addition of 2,4-D ester with glyphosate did not appear to improve control of either giant ragweed or marestail in wheat but improved control in the fallow areas.

The herbicide trials that were conducted during the 2010-2011 season had very few giant ragweed and marestail plants; consequently, no control ratings for these species were made. However, data were collected on weed species that were present.

Visual control ratings of henbit and percent infestation ratings for honeyvine milkweed were done in the spring of 2011 for study 1 (the trial originally targeted for giant ragweed). Finesse provided superior control of henbit; whereas, Peak provided only 63% control of this weed. Wheat yields in this study were equal for all treatments, including the non-treated check.

Visual estimates of percent infestation of dandelion were done in the spring of 2011 for study 2 (the trial originally targeted for marestail). The herbicide treated plots had approximately half the infestation of dandelion compared with the check plots. The fact that Roundup WeatherMAX (glyphosate) was

applied as a burndown to all herbicide treated plots may have helped limit dandelion growth.

The fact there were no statistical differences in wheat yield in study 1 indicated competition from henbit was not a limiting factor. In study 2 all herbicide treatments had similar wheat yields and exceeded the yield of the non-treated check by 13.8 to 21.2 bu/A. The level of dandelion infestation was sufficient to limit wheat yield and did warrant use of herbicide treatments.

SUMMARY

• The vegetative cover that wheat provided throughout the winter and early spring helped control of giant ragweed and marestail by limiting the number of plants when compared with the fallow areas. There was a slight trend in fewer weeds in wheat planted at the recommended rate than wheat seeded at nearly half the recommended rate; yet the differences were rarely statistically significant.

• In most cases wheat also improved weed control by limiting size of weeds; especially giant ragweed, when compared with the fallow areas in 2010. In a few instances the heights of weeds were slightly shorter in the X seeding rate compared with those in the ½ X seeding rate.

Table 1. Giant Ragweed Density and Height Prior to Harvest of Wheat Seeded at Different Rates. [1]

(2009-2010)

Wheat Seeding Rate [2]	Density (Plants/100 ft^2)		Plant Height (Inches)	
	Skip Row	**Harvest Row**	**Skip Row**	**Harvest Row**
X	67 b	31 b	24.6 c	22.8 c
½ X	74 b	48 b	25.1 b	26.6 b
0 (Fallow)	404 a		63.4 a	

(2010-2011)

Wheat Seeding Rate [2]	Density (Plants/100 ft^2)		Plant Height (Inches)	
	Skip Row	**Harvest Row**	**Skip Row**	**Harvest Row**
X	452 b	279 b	20.7 b	17.5 b
½ X	461 b	215 b	22.7 b	18.1 b
0 (Fallow)	1,000 a		29.8 a	

[1] **Plant Counts on 06-07-2010**: Wheat plots had 2 skip rows (14" wide @) and 2 harvest rows (7" wide @) full length of plot. Fallow areas had 4 random sites 4 ft^2 each. Densities were adjusted to plants/100 ft^2.

Plant Counts on 06-13-2011: Wheat plots had 2 skip rows (21" wide @) and 2 harvest rows (7" wide @) full length of plot. Fallow areas had 4 random sites 9 ft^2 each. Densities were adjusted to plants/100 ft^2.

Table 2. Marestail Density and Height Prior to Harvest of Wheat Seeded at Different Rates. [1]

(2009-2010)

Wheat Seeding Rate [2]	Density (Plants/100 ft^2)		Plant Height (Inches)	
	Skip Row	**Harvest Row**	**Skip Row**	**Harvest Row**
X	15 c	3 b	13.3 a	14.1 a
½ X	25 b	5 b	14.6 a	17.3 a
0 (Fallow)	540 a		18.1 a	

(2010-2011)

Wheat Seeding Rate	Density (Plants/100 ft^2)		Plant Height (Inches)	
	Skip Row	**Harvest Row**	**Skip Row**	**Harvest Row**
X	151 b	29 b	6.2 c	3.1 b
½ X	212 b	76 b	8.2 b	3.6 b
0 (Fallow)	1238 a		10.6 a	

[1] **Plant Counts on 06-07-2010**: Wheat plots had 2 skip rows (14" wide @) and 2 harvest rows (7" wide @) full length of plot. Fallow areas had 4 random sites 4 ft^2 each. Densities were adjusted to plants/100 ft^2.

Plant Counts on 06-10-2011: Wheat plots had 2 skip rows (22.5" wide @) and 2 harvest rows (7.5" wide @) full length of plot. Fallow areas had 4 random sites 9 ft^2 each. Densities were adjusted to plants/100 ft^2.

Table 3. Wheat Head Counts and Yield for the X and ½ X Seeding rates in the Giant Ragweed and Marestail Studies. (UKREC 2009-1010 and 2010-2011)

		Giant Ragweed Study		Marestail Study	
YEAR	**Seeding Rate**	Head Counts (Heads/ft^2)	Yield (Bu/A)	Head Counts (Heads/ft^2)	Yield (Bu/A)
2010	X	71	92.8	101	105.7
	½ X	71	87.6	94	108.6
2011	X	108 a	103.2 a	82 a	72.0 a
	½ X	102 a	91.4 b	72 a	64.9 a

The 2010 data were averaged across all herbicide treatments within each study.

Table 4. Herbicide Trials On Broadleaf Weeds In No-Till Wheat (2010-2011) [1]

Herbicide [2]	**Rate**	**Timing**	**STUDY # 1**			**STUDY # 2**	
			Henbit Control (%) (4-20-2011)	**Honeyvine Milkweed Infestation (%) (06-10-2100)**	**Wheat Yield (Bu/A)**	**Dandelion Infestation (%) (06-10-2100)**	**Wheat Yield (Bu/A**
Non-treated Check			0	12	87.4	49	66.8
Valor	2 oz/A	-7 Days EPP	----	---	---	10	85.9
Finesse	0.5 oz/A	Pre	98	14	97.5	12	88.0
Finesse	0.4 oz/A	Fall Post	100	7	97.9	10	88.0
Peak	0.5 oz/A	Fall Post	63	5	85.8	20	86.7
Huskie	13.5 oz/A	Spring Post	89	8	97.5	2	86.0
Harmony Extra Clarity 2,4-D Ester	0.9 oz/A 4 oz/A 0.75 pt/A	Spring Post Spring Post Spring Post	90	9	89.0	3	80.6
Huskie Clarity	11 oz/A 4 oz/A	Spring Post Spring Post	91	10	86.2	12	83.5
LSD (0.05)			9	NS	NS	23	7.7

[1] Study # 1 was targeted for Giant Ragweed and Study # 2 was targeted for Marestail; however, infestations of giant ragweed and marestail were not sufficient to obtain meaningful evaluations. Henbit control ratings reflect percent reduction in biomass; whereas, infestation of honeyvine milkweed and dandelion represent percent infestation or ground cover occupied by these weeds.

[2] Roundup Weather Max was applied as a burndown in all treatments in the marestail study, but was not applied to the Giant Ragweed Study. Additives were included with treatments according to the herbicide labels. Dates for the Giant Ragweed Study were: Planting on 10-15-2010; Pre on 10-27- 2010, Fall Post on 10-12-2010; and Spring Post on 3-18-2011. Dates for the Marestail study were: -7 Days Early Preplant on 11-05-2010; Planting and Pre on 11-12-2010; Fall Post on 12-10-2010; Spring Post on 4-8-2011.