HERBICIDE COMPARISONS ON BROADLEAF WEED CONTROL IN WHEAT

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INTRODUCTION:

Substantial improvements in management have been made during the last decade that have lead to competitive wheat stands and high grain yields. In many cases, broadleaf weed pressure appears to be less in wheat fields, even in situations where no herbicide was applied. This leads to the question "Are there cases where a broadleaf weed herbicide treatment is not needed?"

OBJECTIVE:

Field studies were conducted to compare certain postemergence herbicides for broadleaf weed control in wheat and resulting grain yield of wheat.

METHODS:

This study was conducted at four sites including: 1) UKREC near Princeton, 2) Sanger's farm in Fulton County, 3) Western Kentucky University Farm in Warren County, and 4) Bennet's farm in McLean County. Conventional tillage practices were used to prepare the seed bed. Pioneer 2552 was planted at all locations. A total of 90 units of nitrogen were applied in a 30/60 split. Warrior at 3.5 oz/A was applied in the fall and spring for protection against aphids. Tilt at 4 oz/A was used as a preventative practice for disease control.

The herbicide treatments are listed as follows:

1) Aim (carfentrazone) 40 DF at 0.33 oz/A plus surfactant
2) Aim 40 DF at 0.66 oz/A + surfactant
3) Buctril (bromoxynil) 2 EC at 1.5 pt/A
4) Clarity (dicamba) 2S at 4 oz/A
5) 2,4-D 4 EC 1 pt/A
6) Harmony Extra (premix of thifensulfuron plus tribenuron) 75DF at 0.5 oz/A
7) Sencor (metribuzin) 75 DF at 4 oz/A
8) Nontreated check

The treatments were applied with a CO_2 back-pack sprayer in a spray volume of 20 GPA for the Princeton site and 26 GPA at the other locations. A randomized complete block design was used with 4 replications.

Weather conditions during application were generally favorable with 50 to 60^0F at all locations, except for McLean Co. where the air temperature was 40^0F during application and minimum nighttime temperatures of 25^0F or less for the next three day period.

A visual evaluation of the percent weed cover between rows was made on the day of application. These values would be used as a basis as a part of the criteria for determining if the broadleaf weed herbicide application was warranted. The percent weed cover varied with location and was approximately 20 to 25% at Princeton; 10% at Fulton Co.; 30% at Warren Co.; and 60% at McLean Co. Henbit (*Lamium amplexicaule*) and purple deadnettle (*Lamium purpureum*) were present at all sites. Common chickweed (*Stellaria media*) was present at Princeton, Warren Co., and McLean Co.

Ratings of crop injury and weed control were made in mid April and were based on a scale of 0 to 100, with 0 = no injury or control and 100 = complete death.

The wheat stands at McLean Co. were somewhat variable, consequently plots were not harvested at this site. However, wheat plots at the other locations had good stands and were harvested with a plot combine.

WEED CONTROL RESULTS (Table 1):

Control of henbit or chickweed from Aim did not exceed 50% at any of the sites. Aim did not appear to injure wheat.

Buctril tended to provide better control of henbit than Aim, but did not exceed 68%. As expected, Buctril was more effective on controlling henbit than chickweed, and had only 5% crop injury at one of the four sites.

Chickweed control with Clarity tended to be slightly better at two of the site, yet control of either species did not exceed 58%. Wheat injury occurred at two of the four locations, but did not exceed 8%.

Applications of 2,4-D provided 30 to 73% henbit control and 13 to 48% control of chickweed and did not appear to injure wheat.

Harmony Extra and Sencor tended to be more effective than the other herbicides in controlling both henbit and chickweed. Neither herbicide injured wheat.

YIELD RESULTS (Table 2):

Wheat grain yields for the nontreated checks were 97.5 Bu/A for Princeton, 95.2 Bu/A for Fulton Co., and 80.8 Bu/A for Warren Co. The only herbicide treatment that had a wheat yield greater than the nontreated check was Buctril at Warren Co. The Clarity treatment at Princeton had a yield less than that of the nontreated check.

SUMMARY/CONCLUSIONS:

Harmony Extra and Sencor tended to be more consistent in controlling such broadleaf weed species as henbit and common chickweed than Aim, Buctril, Clarity or 2,4-D. Although broadleaf weed control was improved with some treatments, wheat yield was often unaffected; thus indicating these broadleaf weed herbicide treatments were generally not needed where ground cover

occupied by henbit and chickweed did not exceed 30% during March and early April.

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Table 1. WHEAT INJURY AND BROADLEAF WEED CONTROL WITH POSTEMERGENCE HERBICIDES APPLIED DURING SPRING AT FOUR LOCATIONS (2001) [1]

		Princeton [2]			Fulton Co. [3]		Warren Co. [4]			McLean Co. [5]		
Chemicals	Rate	Wheat (%)	Henbit (%)	Chick-weed (%)	Wheat (%)	Henbit (%)	Wheat (%)	Henbit (%)	Chick-weed (%)	Wheat (%)	Henbit (%)	Chick-weed (%)
Aim 40 DF Surfactant	0.33 oz/A 0.25 % v/v	0	0	0	0	25	0	15	13	0	8	0
Aim 40 DF Surfactant	0.66 oz/A 0.25 % v/v	0	23	0	0	43	0	28	50	0	33	15
Buctril 2 EC	1.5 pt/A	0	43	5	0	68	0	68	20	0	50	3
Clarity 4S	4 oz/A	0	40	58	8	55	0	13	35	3	18	13
2,4-D 4 EC	1 pt/A	0	30	13	0	73	0	30	48	0	30	23
Harmony Extra 75 DF	0.5 oz/A	0	63	75	0	80	0	97	99	0	70	80
Sencor 75 DF	4 oz/A	0	85	85	0	63	0	97	92	0	68	73
Nontreated Check		0	0	0	0	0	0	0	0	0	0	0
LSD (0.05)		NS	28	34	4	22	NS	19	17	2	23	12

[1] Ratings were made in mid- April and based on a scale of 0 to 100; with 0 = no injury or control and 100 = complete death.
[2] Princeton: Applied treatments 4/2/01. Henbit and purple deadnettle were 3" in diameter with 15% ground cover. Common chickweed was 2-4" in diameter with 5-10% ground cover.
[3] Fulton Co. Applied treatments 3/23/01. Henbit and purple deadnettle were 2-4" in diameter with 10% ground cover.
[4] Warren Co. Applied treatments 3/3/01. Henbit and purple deadnettle were 3" in diameter with 15% ground cover. Common chickweed was 4" in diameter with 10% ground cover.
[5] McLean Co. Applied treatments 3/26/01. Henbit and purple deadnettle were 2 - 8" in diameter with 20% ground over.. Common chickweed was 4 - 10" in diameter with 40% ground cover. Weed infestations were variable.

Table 2. WHEAT YIELDS FOLLOWING POSTEMERGENCE HERBICIDES APPLIED DURING SPRING AT FOUR LOCATIONS (2001) [1]

Chemicals	Rate	Wheat Yield (Bu/A)		
		Princeton	Fulton Co	Warren Co
Aim 40 DF Surfactant	0.33 oz/A 0.25 % v/v	103.5	92.9	84.8
Aim 40 DF Surfactant	0.66 oz/A 0.25 % v/v	96.7	95.5	84.1
Buctril 2 EC	1.5 pt/A	98.2	93.8	89.6
Clarity 4S	4 oz/A	86.3	94.9	84.3
2,4-D 4 EC	1 pt/A	105.2	93.8	83.7
Harmony Extra 75 DF	0.5 oz/A	100.9	90.8	83.6
Sencor 75 DF	4 oz/A	104.6	95.4	88.2
Nontreated Check		97.5	95.2	80.8
LSD (0.05)		10	NS	8.6

[1] Wheat variety was Pioneer 2552.