

HERBICIDE EVALUATION TRIALS IN WHEAT

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Several trials were conducted at the University of Kentucky Research and Education Center (UKREC) to evaluate herbicides for managing specific problem weeds. Tables 1A and 1B list herbicides and weed species in these studies. Highlights of these trials are discussed below.

Henbit and Ryegrass Control with Axiom Sequential Programs. (Table 2).

- Axiom alone at 6 oz/A provided 83% control of henbit and 63% control of ryegrass.
- The greatest control of henbit occurred with Axiom applied early post and followed by a post application of either Atlantis or Olympus Flex.
- Fall applications of Atlantis, or Olympus Flex provided at least 86% ryegrass control and did not benefit from an early post treatment of Axiom

Henbit and Ryegrass Control with Prowl H₂O Programs (Table 3)

- Prowl H₂O alone at 3 pt/A at wheat emergence controlled ryegrass and henbit. Prowl H₂O is labeled as a postemergence treatment from the 1-leaf stage of wheat until the flag leaf is visible. Emerged weeds will not be controlled with Prowl H₂O.
- Ryegrass control from Osprey alone was 99 to 100%. The fact the ryegrass infestation was light and that most plants emerged in the fall were reasons residual control from Prowl H₂O was not needed to enhance season-long control with Osprey.
- Delaying Osprey or Osprey + Prowl H₂O treatments until wheat had 1 to 2 tillers

limited henbit control, but did not affect ryegrass control.

- Wheat injury from Sencor was observed up through late February, yet plants seemed to recover by harvest (data not shown). Yield of Sencor treated plots tended to be numerically less compared with those of other treatments, but differences were not statistically significant.

Wild Garlic and Field Brome Control with Spring-Applied Treatments (Table 4)

- Ratings made April 22 (i.e. 44 days after treatment) indicated PowerFlex provided 75% control of wild garlic compared with 83% observed with Harmony Extra SG at 0.45 oz/A. Season-long control of wild garlic could not be determined due to spring competition from field brome.
- The addition of Harmony Extra SG with PowerFlex enhanced the level of wild garlic control relative to PowerFlex alone.
- Harmony Extra SG at 0.9 oz/A provided 90% garlic control
- PowerFlex provided complete control of Field Brome when applied alone or tank mixed with Harmony Extra.

Wild Garlic, Field Brome, and Downy Brome Control with Fall-Applied Treatments (Table 5)

- Herbicides that were applied in the fall and provided 100% control of field brome included Finesse Grass & Broadleaf, PowerFlex, and Olympus Flex.
- Maverick provided 90% control of field brome compared to 80% observed with

Osprey. Axial XL and Hoelon did not control field brome.

- PowerFlex and Olympus Flex provided at least 96% control of downy brome and were superior to the other postemergence herbicides in the study.
- Based on ratings made March 20, fall applied PowerFlex provided 90% control of wild garlic compared with 80% with Finesse Grass & Broadleaf. Wild garlic control observed from other herbicides ranged from 0 to 23%.
- Late-season ratings for wild garlic were not reported due to competition from the weedy grasses.

Postemergence Control of Field Violet in Wheat (Table 6)

- PowerFlex applied in November provided 100% control of field violet.
- Harmony Extra SG and Finesse Grass & Broadleaf each provided 70% control of field violet.

Henbit and Ryegrass Control with Valor Early Preplant Programs (Table 7)

- Roundup PowerMax was included with Valor in order to provide burndown control of weeds. Ratings of weed control usually reflected residual control of Valor.
- Applications of Valor 14 to 30 days prior to planting wheat resulted in erratic residual control of most weeds. These results are attributed to the longer period of time for exposure to soil and warm temperatures which provided a favorable environment for microbial dissipation of Valor when applied 14 or 30 days prior to planting.
- Control of henbit was 94% when applied 7 days before planting. It is not clear why residual control of henbit was only 79% when applied at plantings.
- Valor provided 98 to 99% ryegrass control when applied 7 days early preplant or at planting.

- Valor appeared to contribute soil residual control of marestail (horseweed). However, because marestail stands were light and erratic, it was difficult to assess the impact of timing of control of this weed species (data not shown).

- Wheat injury was not observed in this study. Because of good weed control, Valor provided for high wheat yields when applied at 7 days early preplant and at planting.

Effect of Tillage System and Finesse on Volunteer Corn and Henbit (Table 8)

- Although soil conditions were dry in the fall of 2008, there was sufficient rain to stimulate emergence of volunteer corn when tillage was done approximately 4 weeks ahead of wheat planting. Delaying tillage until planting of wheat limited the emergence of volunteer corn by more than one third compared with tilling 4 weeks ahead of planting. No-till wheat plots had only 0.3 plant/ft² compared with 6.7 plants/ft² where tillage was done 4 weeks ahead of planting.

- Volunteer corn had up to 40% chlorosis nine days after postemergence application of Finesse (data not shown). Corn response to Finesse was slow and plants died from a killing frost (11 days after post application) before Finesse reached its peak activity.

- The percent ground cover occupied by volunteer corn in wheat on 10-26-08 was 22% for plots tilled 4 weeks ahead of planting; 13% for plots tilled at planting; and 2.3% for no-till plots.

- Finesse at 0.5 ounces/A provided complete control of henbit, regardless timing of application.

- The greatest level of henbit infestation occurred where plots were tilled 4 weeks ahead of planting. The percent ground cover occupied by henbit in wheat on 03-17-09 was 80% for plots tilled 4 weeks ahead of planting which was significantly greater than the 60% observed for plots

tilled at planting. The no-till wheat plots had 53% infestation of henbit which was statistically similar to that reported for plots tilled at planting.

- Although wheat yields of Finesse treated plots were numerically greater than the non-treated checks, the differences were not statistically significant.
- When applied in the fall either as a preemergence or early postemergence treatment, Finesse at 0.5 oz/A did not

persist in soil at levels sufficient enough to injure double-crop soybean.

ACKNOWLEDGEMENTS

Appreciation is expressed to the following companies for helping support this research: BASF Ag Products, Bayer CropScience, Dow AgroSciences, DuPont Crop Protection, Syngenta Crop Protection, and Valent USA Corp. Ag Products.

TABLE 1A. HERBICIDES, ACTIVE INGREDIENTS, AND TABLE REFERENCE

<u>HERBICIDE</u>	<u>ACTIVE INGREDIENTS</u>	<u>TABLE</u>
A15438	dicamba + fluroxypyr	6
2,4-D	2,4-D	4
Atlantis	mesosulfuron + iodosulfuron	2
Axial XL	pinoxaden	5
Axiom	flufenacet + metribuzin	2
Everest	flucarbazone	7
Finesse	chlorsulfuron + metsulfuron	8
Finesse Grass & Broadleaf	chlorsulfuron + flucarbazone	5, 6
Harmony Extra	thifensulfuron + tribenuron	4, 6, 7
Harmony GT	thifensulfuron	4
Hoelon	diclofop	5
Huskie	pyrasulfotole + bromoxynil	6
Maverick	sulfosulfuron	5, 7
MCPA Ester	MCPA	6
Olympus Flex	propoxycarbazone + mesosulfuron	2, 5 6
Orion	florasulam + MCPA	6
Osprey	mesosulfuron	3, 5, 6, 7
PowerFlex	pyroxsulam	4, 5, 6
Prowl H ₂ O	pendimethalin	3, 5
Roundup PowerMax	glyphosate	7
Sencor	metribuzin	3
Valor SX	flumioxazin	7

TABLE 1B. WEED SPECIES LISTED BY COMMON NAME, SCIENTIFIC NAME, AND TABLE REFERENCE

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	<u>TABLE</u>
Downy brome	Bromus tectorum	5
Field brome	Bromus arvensis	4, 5
Field violet	Viola arvensis	6
Henbit	Lamium amplexicaule	2, 3, 7, 8
Italian ryegrass	Lolium multiflorum	2, 3, 7
Volunteer corn	Zea Mays	8
Wild garlic	Allium vineale	4, 5

(TABLE 2) SEQUENTIAL PROGRAMS USING AXIOM FOR HENBIT AND RYEGRASS CONTROL (UKREC 2008 - 2009)

TREATMENT		HENBIT CONTROL (%)	RYEGRASS CONTROL (%)	WHEAT YIELD (BU/A)
Herbicide ¹	Timing ²	8 WAT	End of Season	
Axiom 6 oz/A	EP	85	63	95.8
Atlantis 6 oz/A	POST	83	93	131.5
Axiom 6 oz/A Atlantis 6 oz/A	EP POST	98	90	122.3
Olympus Flex 3.5 oz/A	POST	79	86	127.9
Axiom 6 oz/A Olympus Flex 3.5 oz/A	EP POST	99	85	122.8
Non-treated Check		0	0	66.6
LSD (0.05)		9	21	

¹ Additives included with POST treatments according to label

² EP: Applied 10-17-08 1-Leaf Wheat 1 Leaf Ryegrass
POST: Applied 11-26-08 2-Tiller Wheat 4-leaf to 2-tiller ryegrass.

(TABLE 3) RYEGRASS AND HENBIT CONTROL WITH PROWL H₂O PROGRAMS (UKREC 2008-2009)

HERBICIDE ¹	TIMING ²	HENBIT CONTROL (%)	RYEGRASS CONTROL (%)	WHEAT YIELD (BU/A)
		2-26-09	6-13-09	6-22-09
Prowl H ₂ O 3 pt/A	WH Emerg	100	100	109.5
Prowl H ₂ O 3 pt/A Osprey 4.7 oz/A	WH Emerg WH 1-2 Tiller	100	100	110.0
Prowl H ₂ O 3 pt/A Sencor	WH 1-2 Leaf WH 1-2 Leaf	100	95	107.2
Osprey 4.7 oz/A	WH 1-2 Leaf	98	100	112.4
Osprey 4.7 oz/A Prowl H ₂ O 2 pt/A	WH 1-2 Leaf WH 1-2 Leaf	100	99	116.1
Osprey 4.7 oz/A Prowl H ₂ O 3 pt/A	WH 1-2 Leaf WH 1-2 Leaf	100	100	111.3
Osprey 4.7 oz/A	WH 1-2 Tiller	87	100	114.4
Osprey 4.7 oz/A Prowl H ₂ O 2 pt/A	WH 1-2 Tiller WH 1-2 Tiller	87	99	116.3
Non-treated Check		0	0	104.1
LSD (0.05)		9	3	9.6

Planted Branson 10-22-08, 36 viable seed/ft²

Treatments:

- 11-3-08: Wheat emergence, Henbit in cotyledon stage.
- 11-08-08: 1 to 2 leaf wheat; Ryegrass 1 leaf and 2 inches tall; Henbit cotyledon to 4 leaves.
- 12-15-08: 1 to 2 tiller wheat; Ryegrass 3 leaf and 1.5 inches tall; Henbit 1" in diameter

**(TABLE 4) WILD GARLIC & FIELD BROME CONTROL WITH POSTEMERGENCE
HERBICIDES APPLIED IN THE SPRING (UKREC 2008-2009)**

CHEMICALS (RATE /A)	WILD GARLIC CONTROL (%)		FIELD BROME CONTROL (%)	
	04-22-09	4-22-09	06-11-09	
PowerFlex 3.5 oz/A Agri-Dex COC 1.25%	75	70	100	
Harmony Extra SG 0.45 oz/A Agri-Dex COC 1.25%	83	0	0	
PowerFlex 3.5 oz/A Harmony Extra SG 0.45 oz/A Agri-Dex COC 1.25%	86	71	100	
Harmony Extra SG 0.75 oz/A Agri-Dex COC 1.25%	83	0	0	
PowerFlex 3.5 oz/A Harmony Extra SG 0.75 oz/A Agri-Dex COC 1.25%	89	68	100	
Harmony Extra SG 0.9 oz/A Agri-Dex COC 1.25%	90	0	0	
PowerFlex 3.5 oz/A Harmony Extra SG 0.9 oz/A Agri-Dex COC 1.25%	85	73	100	
2,4-D 16 oz/A Agri-Dex COC 1.25%	30	0	0	
PowerFlex 3.5 oz/A Harmony GT 0.2 oz/A Agri-Dex COC 1.25%	85	68	100	
Harmony GT 0.2 oz/A Agri-Dex COC 1.25%	78	0	0	
Non-Treated Check	0	0	0	
LSD (0.05)	8	7	0	

Wheat planted conventional till on 10-06-08. Variety was Branson. Seeding rate 36 viable seed/ft².

Treatments were applied 03-09-09.

- Wheat 4-5" tall 2-7 tillers
- Wild garlic: 4 to 9", avg. 6" tall, 2 to 3 leaves, (note that 50% of plants had curled leaves due to cold temps
- Field Brome (*Bromus arvensis*) 5 to 7 tillers, average 3" tall

Garlic ratings at the end of the season were not recorded due to competition from Field Brome.

Wheat yields were not reported due to erratic stands.

(TABLE 5) FIELD BROME, DOWNY BROME, AND WILD GARLIC CONTROL WITH POSTEMERGENCE HERBICIDES APPLIED IN THE FALL¹ (UKREC 2008-2009)

CHEMICALS (RATE /A) ²	FIELD BROME	DOWNY BROME	WILD GARLIC ³	
	CONTROL (%)	CONTROL (%)	CONTROL (%)	PLANTS/100 FT ²
	5-9-09	5-9-09	3-20-09	04-08-09
Axial XL (16.4 oz/A)	0	0	0	78
Finesse Grass & Broadleaf (¾oz/A) NIS (0.5%) Liquid N 28% (4 pt/A)	100	13	80	58
Hoelon (2 pt/A)	0	0	0	120
Maverick (0.67 oz/A) NIS (0.5%)	90	53	0	87
PowerFlex (3.5 oz/A) NIS (0.5%) Liquid N 28% (4 pt/A)	100	98	90	32
Olympus Flex (3 oz/A) NIS (0.5%) Liquid N 28% (4 pt/A)	100	96	23	183
Osprey (4.75 oz/A) NIS (0.5%) Liquid N 28% (4 pt/A)	80	50	0	139
Axial XL (16.4 oz/A) Prowl H2O (2.1 pt/A)	0	0	0	103
PowerFlex (3.5 oz/A) NIS (0.5%) Liquid N 28% (4 pt/A) Prowl H2O (2.1 pt/A)	100	93	90	31
Non-treated Check	0	0	0	105
LSD (0.05)	0.4	7.6	22	51

¹Wheat planted no-till on 10-09-08. Variety was Branson. Seeding rate 36 viable seed/ft².

²Treatments were applied 11-13--08.

- Spray volume was 20 GPA for all treatments except for 10 GPA for Axial XL Treatments.
- Wheat 5 to 6.5" tall; 1 to 3 tillers
- Weedy grasses: 3" tall, 1 leaf to 3 tillers (averaged 1 tiller). In addition to field brome (*Bromus arvensus*) and downy brome (*Bromus tectorum*), Italian ryegrass (*Lolium multiflorum*) and little barley (*Hordeum pusillum*) were also present, but their infestation was too erratic to evaluate.

³Garlic ratings at the end of the season were not recorded due to competition from weedy grasses. Wheat yields were not reported due to flood damage.

**(TABLE 6) FIELD VIOLET CONTROL WITH POSTEMERGENCE HERBICIDES
APPLIED IN THE FALL (UKREC 2008-2009)**

CHEMICALS	RATE	FIELD VIOLET CONTROL (%)
		5-07-09
A15438	8.3 oz/A	0
A15438 Harmony Extra SG NIS (non - ionic surfactant)	8.3 oz/A 0.2 oz/A 0.2 5% v/v	17
A15438 MCPA Ester	8.3 oz/A 8 oz/A	0
Harmony Extra SG NIS	0.45 oz/A 0.25% v/v	70
Orion NIS	17 oz/A 0.25%	0
Finesse Grass & Broadleaf NIS Liquid N 28%	0.75 oz/A 0.25% v/v 2 qt/A	70
Huskie NIS Liquid N 28%	13.5 oz/A 0.5 % v/v 2 qt/A	0
Osprey NIS Liquid N 28%	4.75 oz/A 0.5 % v/v 2 qt/A	17
Olympus Flex NIS Liquid N 28%	3 oz/A 0.5 % v/v 2 qt/A	0
PowerFlex NIS Liquid N 28%	3.5 oz/A 0.5 % v/v 2 qt/A	100
Non-treated Check		0
LSD (0.05)		20

Wheat planted no-till on 10-09-08. Variety was Branson. Seeding rate 36 viable seed/ft².

Treatments were applied 11-26-08.

- Wheat 4-5" tall 3 tillers

**(TABLE 7) EARLY PREPLANT APPLICATIONS OF VALOR FOR HENBIT
AND RYEGRASS CONTROL IN WHEAT (UKREC 2008-2009)**

CHEMICALS (RATE /A)	TIMING	HENBIT CONTROL (%)	RYEGRASS CONTROL (%)	WHEAT YIELD (BU/A)
		2-26-09	6-12-09	6-22-09
Valor SX (2 oz/A) Roundup PowerMax (22 oz/A) NIS (0.5%)	30 Days EPP	45	66	85.9
Valor SX (2 oz/A) Roundup PowerMax (22 oz/A) NIS (0.5%)	14 Days EPP	63	73	98.1
Valor SX (2 oz/A) Roundup PowerMax (22 oz/A) NIS (0.5%)	7 Days EPP	94	98	132.8
Valor SX (2 oz/A) Roundup PowerMax (22 oz/A) NIS (0.5%)	At Planting	79	99	135.5
Everest (0.6 oz/A) Roundup PowerMax (22 oz/A) NIS (0.5%)	7 Days EPP	80	98	130.5
Valor SX (2 oz/A) Everest (0.6 oz/A) Roundup PowerMax (22 oz/A) NIS (0.5%)	7 Days EPP	95	100	131.8
Valor SX (2 oz/A) Roundup PowerMax (22 oz/A) NIS (0.5%) Maverick (0.67 oz/A) NIS (0.5%)	7 Days EPP Post	97	100	140.7
Roundup PowerMax (22 oz/A) NIS (0.5%) Maverick (0.67 oz/A) NIS (0.5%)	7 Days EPP Post	93	100	135.2
Roundup PowerMax (22 oz/A) NIS (0.5%) Harmony Extra (0.4 oz/A) NIS (0.5%)	7 Days EPP Post	92	95	136.5
Roundup PowerMax (22 oz/A) NIS (0.5%) Osprey (4.75 oz/A) NIS (0.5%) Liquid N 28% (2 qt/A)	7 Days EPP Post	91	100	143.5
Non-Treated Check		0	0	69.9
LSD (0.05)		19	12	20

Wheat planted no-till on 10-22-08. Variety was Branson. Seeding rate 36 viable seed/ft². Seeding Depth 1.75"
Application Timings: (30 days EPP = 9-22-08), (14 days EPP = 10-08-08), (7 days EPP = 10-15-08), (At Planting 10-22-08), and (Post 11-26-08)
Treatments were applied 03-09-09.
- Wheat 4-5" tall 2-7 tillers
Lime applied 10-08-08 at 1.5 Tons/A

TABLE 8. IMPACT OF TILLAGE SYSTEM AND FINESSE ON VOLUNTEER CORN, HENBIT, AND STANDS OF DOUBLE-CROP SOYBEANS (2008-2009)¹

TILLAGE SYSTEM ²	FINESSE TIMING ³	VOLUNTEER CORN ⁴		HENBIT INFESTATION ⁵ (%)	WHEAT YIELD (BU/A)	DOUBLE-CROP SOYBEAN STAND ⁶ (PLANTS/3' OF ROW)
		DENSITY (PLANTS/FT ²)	INFESTATION (%)			
Conv Till System 1	Pre	—	20	0	129.9	24.0
	Post	—	17	0	122.9	23.8
	Check	6.7	22	80	115.5	22.5
Conv.Till System 2	Pre	—	17	0	125.7	23.0
	Post	—	17	0	128.4	23.8
	Check	1.7	13	60	118.6	22
No-Till	Pre	—	2.3	0	123.5	19.8
	Post	—	3.7	0	130.3	23.0
	Check	0.3	2.3	53	114.2	22.7
LSD (0.05)		3.8	11.4	17.7	23	NS

¹ - Planted wheat 10-09-08, Variety Branson, Seeding rate 36 viable seed/ft²
 - No-till corn was harvested 9-9-08. Roundup Ready corn seed was then overseeded with a tractor mounted cyclone seeder at a rate of 7.65 seeds/ft² (approximately 4.2 bu/A) to achieve uniform population of corn seed. Soil conditions were dry at time of overseeding of volunteer corn seed. The first significant rain occurred approximately 18 days after overseeding corn. First killing frost occurred 10-28-09.
 - Planted double-crop soybean in 30" rows 6-26-09

² Tillage Systems:

- Conventional Till System 1: Disked 9-12-08 (27 days before wheat planting)
- Conventional Till System 2: Disked 10-09-08 (at wheat planting)
- No-till (direct planted wheat into clipped corn stalks)

³ Finesse: Applied at 0.5 oz/A

- Before wheat emergence 10-11-08 (Volunteer corn was not emerged)
- After wheat emergence 10-17-08. (Volunteer corn 2" tall with 1 leaf collar; Wheat 2" tall and 1-leaf stage)

⁴ Counted corn plants at two random sites in non-treated checks (10-17-08) to determine effect of tillage system on emergence of volunteer corn. Rated percent ground cover occupied by emerged volunteer corn plants on 10-26-08.

⁵ Rated percent ground cover occupied by henbit on 3-17-09.

⁶ Counted soybean plants/3 ft of row at two random sites/plot on 7-9-09.