

**PROJECT TITLE:** Broadleaf Surfactant Study

**PROJECT LEADERS:** Bob Stougaard and Todd Keener, NWARC, Kalispell, MT.

**OBJECTIVES:** Evaluate the sulfonyleurea herbicides Harmony Extra and Express in combination with 2,4-D, and/or Banvel for possible enhanced broadleaf weed control when applied in tank mix with Cayuse and/or R-11 surfactant.

**RESULTS:**

This study was established to determine if broadleaf weed control in small grains could be enhanced with the addition of surfactants to standard herbicide treatments. The core treatments consisted of reduced rates of Harmony Extra and Express applied alone or in combination with 2,4-D or 2,4-D plus Banvel. These treatments were applied without a surfactant or tank-mixed with a non-ionic surfactant (R-11) or a non-ionic surfactant plus a UAN liquid fertilizer mixture (R-11 plus Cayuse) at different concentrations. Banvel plus 2,4-D was included as a standard and was tank-mixed with the same surfactant combinations. Treatments were applied late when spring barley was 12 inches tall and fully tillered. Wild buckwheat was the dominant weed species present and was 3-5 inches tall.

The effect of surfactants on wild buckwheat control varied among herbicides. Wild buckwheat control was improved by additions of surfactants for treatments which included Harmony Extra. Control was 70% for Harmony Extra alone compared to 90% when R-11 plus Cayuse were added at the highest concentration. The same trends were observed for 2,4-D plus Banvel treatments. Weed control with treatments which included Express did not respond to the additions of surfactants. Spring barley yields were erratic, probably due to the late application timing. As such, the effect of these treatments in reducing weed competition or causing crop injury can not be accurately assessed. It appears that surfactant effects vary with the herbicide in question.

**SUMMARY:**

The effect of surfactants varied by herbicide. Wild buckwheat control was improved when surfactants were added to Harmony Extra, but not with Express.

**FUTURE PLANS:**

Although there appears to be potential to improve weed control and possibly reduce rates, research will need to be conducted with specific herbicides as well as weed species.

Table 1. Agronomic data from the Broadleaf Surfactant Herbicide trial located on the NWARC, Kalispell, MT in 1992.

Treatment	Rate	YIELD BU/A	% CROP INJURY	% STAND REDUCT.	% CONTROL POLCO 1/
1. Harmony Extra 2,4-D LV4	3 oz prod 5 lb	53	0	4	68
2. Harmony Extra 2,4-D LV4 Banvel	4 oz prod .25 lb oz prod	73	7	8	73
3. 2,4-D LV4 Banvel	oz prod oz prod	62	2	12	66
4. Express 2,4-D LV4	167 oz prod .25 lb	72	0	7	49
5. Express 2,4-D LV4 Banvel	167 oz prod .25 lb 4 oz prod	37	5	13	83
6. Harmony Extra 2,4-D LV4 R-11	167 oz prod .25 lb .25% v/v	44	2	10	85
7. Harmony Extra 2,4-D LV4 Banvel R-11	167 oz prod 25 lb oz prod .25% v/v	39	3	15	86
8. 2,4-D LV4 Banvel R-11	oz prod oz prod 25% v/v	38	0	13	83
9. Express 2,4-D LV4 R-11	167 oz prod 25 lb 25% v/v	53	0	3	56
10. Express 2,4-D LV4 Banvel R-11	167 oz prod 25 lb oz 25% v/v	54	0	13	65
11. Harmony Extra 2,4-D LV4 Cayuse R-11	1 oz 25 lb 25% v/v 25% v/v	49	0	7	83

Cont'd on page 2

P-VALUE = .136 .017 .335 .000  
LSD(0.05 by t) = 22.8 7.03 11.0 14.7

Table 1. ( Cont'd ). Broadleaf Surfactant Herbicide Trial, NWARC.

Treatment	Rate	YIELD BU/A	% CROP INJURY	% STAND REDUCT.	% CONTROL POLCO 1/
12. Harmony Extra	.1 oz	51	2	7	88
2,4-D LV	.25 lb				
Banvel	4 oz prod				
Cayuse	.25% v/v				
R-11	.25% v/v				
13. 2,4-D LV	8 oz prod	49	8	13	83
Banvel	5 oz prod				
Cayuse	.25% v/v				
R-11	.25% v/v				
14. Express	.167 oz prod	52	2	12	73
2,4-D LV4	.25 lb				
Cayuse	.25% v/v				
R-11	.25% v/v				
15. Express	.167 oz prod	51	5	17	84
2,4-D LV4	.25 lb				
Cayuse	.5% v/v				
R-11	.25% v/v				
16. Harmony Extra	.1 oz prod	55	0	10	91
2,4-D LV	.25 lb				
Cayuse	.5% v/v				
R-11	.25% v/v				
17. Harmony Extra	.1 oz prod	53	2	13	92
2,4-D LV	.25 lb				
Banvel	4 oz prod				
Cayuse	.5% v/v				
R-11	.25% v/v				
18. 2,4-D LV	8 oz prod	57	12	18	85
Banvel	5 oz prod				
Cayuse	.5% v/v				
R-11	.25% v/v				
19. Express	.167 oz prod	52	0	10	53
2,4-D LV4	.25 lb				
Cayuse	.5% v/v				
R-11	.25% v/v				
20. Express	.167 oz prod	38	10	13	89
2,4-D LV4	.25 lb				
Banvel	5 oz prod				
Cayuse	.5% v/v				
R-11	.25% v/v				
Untreated		61	0	5	0

P-VALUE = .136    .017    .335    .000  
LSD(0.05 by t) = 22.8    7.03    11.0    14.7

1/ POLCO = Wild buckwheat ( Polygonum convolvulus ) Letters are a WSSA-approved computer code from Composite List of Weeds.