

Weed control in irrigated potato with rimsulfuron combinations. Hatterman-Valenti, Harlene M. and Paul G. Mayland. Several new herbicides are potential candidates for registration on potatoes. A study was conducted at the Northern Plains Potato Growers Irrigation Research site to evaluate pre and post tank-mixed or sequential applications of rimsulfuron and new product offerings for crop safety and weed control in potatoes. The study was conducted on sandy loam soil with 1.8% organic matter and 7.6 pH that for the past several years had been cropped for hay (alfalfa/brome mixture). Plots were 4 rows by 30 ft arranged in a randomized complete block design with three replications. 'Russet Burbank' potatoes were planted on 36 inch rows and 12 inch spacing on May 21, 2002. Treatments were applied to the middle 2 rows. Crop injury and weed control were evaluated 31 and 52 days after treatment (DAT). Water was not limiting as irrigation was scheduled every 3-4 days once potatoes had emerged following hilling. Potatoes were machine harvested October 2 and graded October 15. Application, environmental, crop, and weed data are listed below:

Date:	6/14/02	7/15/02
Treatment:	PRE	POST
Sprayer:		
gpa:	8.5	20
psi:	35	35
nozzle:	11001	11002
Temperature:		
Air (F):	73	94
Soil (4 inch):	69	91
Rel. Hum. (%):	32	30
Wind (mph):	6	19
Soil Moisture:	dry	moist
Cloud Cover (%):	5	0
Potato:		
Height (inch):	1	14
Spiny amaranth		
Height (inch):	-	4-6
Leaf number:	-	4-8
Wild buckwheat		
Height (inch):	-	4-6
Leaf number:	-	4-8
Green foxtail		
Height (inch):	-	1-4
Leaf number:	-	3-7

Flumioxazin alone or in combination with rimsulfuron caused some early potato injury (Table 1). Weed infestation levels were considered light to moderate. All treatments with preemergence herbicides except sulfentrazone alone or with rimsulfuron (post), flumioxazin with rimsulfuron (post), and dimethenamid-P alone provided acceptable early season control of green foxtail, spiny amaranth, and wild buckwheat. Flumioxazin and sulfentrazone weakness was with green foxtail while dimethenamid showed some weakness on wild buckwheat. Postemergence applications of rimsulfuron alone or with EPTC just prior to irrigation did not provide adequate control of the three species evaluated. Potato yield and grade varied and did not show a trend associated with early injury or lack of weed control (Table 2). Lowest marketable yield occurred with the untreated and the flumioxazin followed by rimsulfuron (post) treatment (Plant Sciences Dept., North Dakota State University).

Table 1. Weed control in irrigated potato with rimsulfuron combinations (Hatterman-Valenti and Mayland).

Treatment	Application method	Rate (oz/A)	Crop Injury		AMASP control		POLCO control		SETVI control	
			7/15	8/5	7/15	8/5	7/15	8/5	7/15	8/5
							%			
Rimsulfuron	PRE	0.375	2	2	98	97	94	97	95	90
Dimethenamid-p	PRE	10.6								
Rimsulfuron	PRE	0.375	7	3	98	100	97	95	97	93
Flumioxazin	PRE	1.5								
Rimsulfuron	PRE	0.375	2	0	98	100	96	100	96	87
Sulfentrazone	PRE	1.5								
Rimsulfuron	PRE	0.375	0	0	98	98	97	90	95	94
Metribuzin	PRE	8.0								
Rimsulfuron	PRE	0.375	0	1	98	100	94	90	96	92
Dimethenamid-p	PRE	10.6								
Rimsulfuron	POST	0.375	3	4	97	93	85	77	93	82
MSO	POST	1 % v/v								
Flumioxazin	PRE	1.5								
Rimsulfuron	POST	0.375	8	3	98	90	98	100	78	87
MSO	POST	1 % v/v								
Sulfentrazone	PRE	1.5								
Rimsulfuron	POST	0.375	3	1	95	88	95	77	37	73
MSO	POST	1 % v/v								
Dimethenamid-p	PRE	10.6	0	3	95	83	73	80	88	83
Flumioxazin	PRE	1.5	9	1	98	100	98	100	87	77
Sulfentrazone	PRE	1.5	0	1	98	93	96	100	10	13
Rimsulfuron	POST	0.37								
MSO	POST	1 % v/v	0	0	-	58	-	51	-	50
Rimsulfuron		0.375								
EPTC	POST	14.0								
AMS	POST	17 lb/100 gal	-	2	-	53	-	55	-	47
MSO		1 % v/v								
Untreated			0	0	0	0	0	0	0	0
LSD 0.05			4	3	3	14	8	14	11	17

Table 2. Potato grade and yield following rimsulfuron combinations (Hatterman-Valenti and Mayland).

Treatment	Application method	Rate (oz/A)	Yield				Hollow heart (%)	Specific gravity
			<4 oz	4-10 oz	10-16 oz	US #1		
			cwt/A					
Rimsulfuron	PRE	0.375	24	231	95	326	33	1.0849
Dimethenamid-p	PRE	10.6						
Rimsulfuron	PRE	0.375	27	232	86	318	40	1.0848
Flumioxazin	PRE	1.5						
Rimsulfuron	PRE	0.375	21	222	98	322	25	1.0827
Sulfentrazone	PRE	1.5						
Rimsulfuron	PRE	0.375	26	249	87	349	35	1.0841
Metribuzin	PRE	8.0						
Rimsulfuron	PRE	0.375	27	221	83	303	38	1.0829
Dimethenamid-p	PRE	10.6						
Rimsulfuron	POST	0.375	32	248	88	336	33	1.0837
MSO	POST	1 % v/v						
Flumioxazin	PRE	1.5	17	195	60	255	15	1.0836
Rimsulfuron	POST	0.375						
MSO	POST	1 % v/v	21	201	72	274	43	1.0822
Sulfentrazone	PRE	1.5						
Rimsulfuron	POST	0.375	24	227	65	295	23	1.0808
MSO	POST	1 % v/v						
Dimethenamid-p	PRE	10.6	27	228	64	291	38	1.0845
Flumioxazin	PRE	1.5						
Sulfentrazone	PRE	1.5	30	248	81	331	25	1.0843
Rimsulfuron	POST	0.37						
MSO	POST	1 % v/v	31	258	77	340	29	1.0825
Rimsulfuron	POST	0.375						
EPTC	POST	14.0	28	274	73	347	23	1.0829
AMS	POST	17 lb/100 gal						
MSO	POST	1 % v/v	32	225	32	257	33	1.0812
Untreated								
LSD 0.05			11	67	41	64	18	0.0065