

Weed Management in Potatoes with Outlook, Eptam, and Matrix

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The objective was to evaluate weed control with Outlook, Eptam, and Matrix to find alternative options for Sencor (metribuzin) due to the increasing concern for metribuzin resistance. The study was conducted twice, once in 2016 at the WSU Othello Research Farm near Othello, WA and again in 2017 at the WSU Tri-Cities Irrigated Research Farm in Pasco, WA. Treatments were applied preemergence (PRE), detailed in Table 1, 2 and 3. The study was conducted in a randomized complete block with 3 replications. Plots were 6' by 18' long and were supplemented with irrigation at both sites. Potato variety Alturas was planted on May 3rd, 2016 in Othello and May 11th, 2017 in Pasco. The 2016 study was applied with Select Max (32 fl oz A⁻¹; clethodim) and COC (1% v/v) for grass weed control due to heavy barnyardgrass pressure.

Broadleaf weed control was visually rated 45, 86, and 111 days after treatment (DAT) for the 2017 study and crop injury was visually assessed 16 DAT. No visual ratings were taken for the 2016 study. Both studies had were harvested by hand, collecting potatoes from a single row over a length of 5' from each plot in September. Potatoes were sorted before being weighed by size. All data were subjected to an analysis of variance using the statistical package built into the Agricultural Research Manager software system (ARM 8.5.0, Gylling Data Management).

Ratings for the 2017 study observed no visual crop injury 16 days after treatment (DAT). All treatments in 2017 visually control redroot pigweed (AMARE) and common lambsquarters (CHEAL) compared to the nontreated control at 45, 86, and 111 DAT (Table 2).

The 2016 study, treatments significantly increased market yield, US 1 & 2s greater than 6 ounces Tons A⁻¹, and percent number of US 1s greater 4 ounces and US 1 & 2s greater than 6 ounces compared to the nontreated control (Table 3). Market yield for the nontreated control was 10 tons A⁻¹ and greater than 23 tons A⁻¹ for all treatments applied. There was also an increased in percent number of culls for the nontreated control (62%) compared to all treatments (less than 30%). There were no differences between treatments and the nontreated control for the percent number of US 2s greater than 4 ounces (Table 3).

The repeated study in 2017, found in differences between any treatment and the nontreated control for market yield, US 1 & 2s greater than 6 ounces tons A⁻¹, and percent counts for US 1s and US 2s greater than 4 ounces, US 1 & 2s greater than 6 ounces, and culls (Table 4).

There was no difference in control and yields observed for any treatment with and without of Sencor (metribuzin) included in the treatment. Outlook, Eptam, and Matrix all provided the comparable broadleaf weed control and yield to Sencor (Table 2, 3, & 4).

Table 1. Treatment application details

Study Application	2016 Study	2017 Study
Date	May 9, 2017	May 23, 2017
Application volume (GPA)	15	15
Crop Stage	PRE	PRE
Air temperature (°F)	59	80
Soil temperature (°F)	61	74
Wind velocity (mph, direction)	8.8, NW	1.3, SE
Cloud cover (%)	0	0

Table 2. Percent crop injury, broadleaf weed control for redroot pigweed (AMARE) and common lambsquarters (CHEAL) for 2017 potato study in Pasco, WA using either Outlook, Eptam, and Matrix in combination with other herbicides. Pasco, WA, 2017. DAT = days after treatment. Means followed by the same letter are not statistically significantly different ($\alpha=0.05$)

Treatment	Rate		June 8, 2017	July 7, 2017	August 17,	September 11, 2017		
			16 DAT	45 DAT	2017	111 DAT	AMARE	CHEAL
	field rate	lb ai/A	Injury %	AMARE Control %	CHEAL Control %	Weed Control %	Control %	Control %
Nontreated			-	-	-	-	-	-
Outlook	18 fl oz/A	0.840	0	99	99	98	99	99
Sencor	10.7 oz/A	0.500						
Outlook	18 fl oz/A	0.840	0	99	99	98	99	96
Prowl H2O	2.1 pt/A	1.000						
Outlook	18 fl oz/A	0.840	0	99	99	99	99	99
Linex	24 fl oz/A	0.750						
Eptam	6 pt/A	5.250	0	99	99	99	99	99
Sencor	10.7 oz/A	0.500						
Eptam	6 pt/A	5.250	0	99	99	99	99	96
Prowl H2O	2.1 pt/A	1.000						
Eptam	6 pt/A	5.250	0	99	99	99	99	99
Linex	24 fl oz/A	0.750						
Matrix	1.47 oz/A	0.023	0	99	99	99	99	98
Sencor	10.7 oz/A	0.500						
Matrix	1.47 oz/A	0.023	0	99	99	96	99	99
Prowl H2O	2.1 pt/A	1.000						
Matrix	1.47 oz/A	0.023	0	99	99	98	99	99
Linex	24 fl oz/A	0.750						
Sencor	10.7 oz/A	0.500	0	99	99	99	69	99
Linex	24 fl oz/A	0.750						
Prowl H2O	2.1 pt/A	1.000	0	99	99	93	99	99
Linex	24 fl oz/A	0.750						
		LSD	NS	NS	NS	NS	NS	NS

Table 3. Average potato counts by grade size and yield at harvest for 2016 potato study in Othello, WA using either Outlook, Eptam, and Matrix in combination with other herbicides. Othello, WA, 2016. DAT = days after treatment. Means followed by the same letter are not statistically significantly different ($\alpha = 0.05$).

Treatment	Rate		Counts				Yield	
			September, 2016				September, 2016	
	field rate	lb ai/A	US 1s > 4 oz %	US 2s > 4 oz %	US 1 & 2s > 6 oz %	Culls & < 4 oz %	US 1 & 2 > 6 oz Tons/A	Market Tons/A
Nontreated			35 b	3	12 b	62 a	1 b	10 b
Outlook	18 fl oz/A	0.840						
Sencor	10.7 oz/A	0.500	71 a	6	50 a	23 b	15 a	30 a
Outlook	18 fl oz/A	0.840	71 a	4	50 a	24 b	15 a	29 a
Prowl H2O	2.1 pt/A	1.000						
Outlook	18 fl oz/A	0.840	69 a	6	49 a	25 b	14 a	28 a
Linex	24 fl oz/A	0.750						
Eptam	6 pt/A	5.250	73 a	4	48 a	23 b	14 a	29 a
Sencor	10.7 oz/A	0.500						
Eptam	6 pt/A	5.250	71 a	6	52 a	23 b	16 a	31 a
Prowl H2O	2.1 pt/A	1.000						
Eptam	6 pt/A	5.250	72 a	8	58 a	20 b	16 a	27 a
Linex	24 fl oz/A	0.750						
Matrix	1.47 oz/A	0.023	75 a	2	50 a	23 b	14 a	28 a
Sencor	10.7 oz/A	0.500						
Matrix	1.47 oz/A	0.023	71 a	9	55 a	20 b	12 a	23 a
Prowl H2O	2.1 pt/A	1.000						
Matrix	1.47 oz/A	0.023	69 a	10	48 a	21 b	14 a	29 a
Linex	24 fl oz/A	0.750						
Sencor	10.7 oz/A	0.500	76 a	2	49 a	22 b	16 a	30 a
Linex	24 fl oz/A	0.750						
Prowl H2O	2.1 pt/A	1.000	69 a	1	36 a	30 b	9 a	25 a
Linex	24 fl oz/A	0.750						
		LSD	12	NS	17	12	7	7

Table 4. Average potato counts by grade size and yield at harvest for 2017 potato study in Pasco, WA using either Outlook, Eptam, and Matrix in combination with other herbicides. Pasco, WA, 2017. DAT = days after treatment. Means followed by the same letter are not statistically significantly different ($\alpha = 0.05$).

Treatment	Rate		Counts				Yield	
			September 22, 2017				September 22, 2017	
			US 1s > 4 oz	US 2s > 4 oz	US 1 & 2s > 6 oz	Culls & < 4 oz	US 1 & 2 > 6 oz	Market
field rate	lb ai/A	%	%	%	%	Tons/A	Tons/A	
Nontreated			17	0	61	21	15	24
Outlook	18 fl oz/A	0.840						
Sencor	10.7 oz/A	0.500	28	0	54	18	15	28
Outlook	18 fl oz/A	0.840						
Prowl H2O	2.1 pt/A	1.000	30	1	45	24	12	24
Outlook	18 fl oz/A	0.840						
Linex	24 fl oz/A	0.750	46	0	43	23	10	23
Eptam	6 pt/A	5.250						
Sencor	10.7 oz/A	0.500	20	2	60	17	18	29
Eptam	6 pt/A	5.250						
Prowl H2O	2.1 pt/A	1.000	19	1	61	18	20	33
Eptam	6 pt/A	5.250						
Linex	24 fl oz/A	0.750	27	2	46	24	16	30
Matrix	1.47 oz/A	0.023						
Sencor	10.7 oz/A	0.500	26	2	43	28	10	22
Matrix	1.47 oz/A	0.023						
Prowl H2O	2.1 pt/A	1.000	41	1	42	15	13	27
Matrix	1.47 oz/A	0.023						
Linex	24 fl oz/A	0.750	47	1	35	17	10	24
Sencor	10.7 oz/A	0.500						
Linex	24 fl oz/A	0.750	28	1	51	19	17	33
Prowl H2O	2.1 pt/A	1.000						
Linex	24 fl oz/A	0.750	19	1	50	28	15	27
		LSD	NS	NS	NS	NS	NS	NS