

Potato Herbicide Evaluations

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Introduction

This project was conducted to evaluate new and potential potato herbicides, League and Zidua, in weed management programs. Zidua (pyroxasulfone) is a BASF product now being used in crops of corn, soybeans, and wheat. Currently, Zidua is not labeled for use on potatoes but BASF is planning to expand the label to include the crop in the future. League herbicide, from Valent U.S.A. Corporation, has a supplemental label for potatoes. The active ingredient is imazosulfuron, an ALS-inhibiting herbicide that is reported to have pre and postemergent activity against yellow nutsedge, purslane, and pigweeds, and postemergent activity against morning glory.

Materials and Methods

The trial was conducted on a Fruitfield sandy soil with 1.7 percent organic matter and soil pH of 6.0. The ground was prepared for planting by chisel plowing and disking. Normal cultural practices were followed for fertilization, irrigation, and pest control. Whole, B-sized, seed pieces of cultivar Atlantic were planted on April 10 at 8 in. spacing in rows 42 in. apart. Trial design was a randomized complete block with 3 replications. Herbicide plots consisted of 3 rows 20 ft in length. Herbicide treatments were applied with a CO₂ small plot sprayer with a 4-nozzle boom calibrated to apply 20 gpa at 20 psi. Herbicide products are described in Table 1. Preemergence (PRE) herbicide treatments were applied to a dry soil surface on April 24 before potato sprouts had emerged. Postemergent (POST) treatments were applied on May 27 when potato plants were approximately 12 in. tall and were at early tuberization. Weed control ratings were

conducted on June 17 and again right before harvest. The more abundant weeds were crabgrass, yellow foxtail, annual morning glory, and carpetweed. Weed control ratings were determined by identifying and counting the number of weeds in a 20 square ft area of each plot. The center row of each plot was harvested for potato yield determinations on July 14.

Results and Discussion

All herbicide treatments in Tables 2 and 3 reduced the number of weeds in treated areas and at harvest produced more potatoes than untreated control plots. Table 2 presents data from treatments evaluating Zidua herbicide and Table 3 presents data from treatments evaluating League herbicide.

Zidua has been evaluated for two years and looks to be a safe and effective Group 15 herbicide for potatoes. It has good activity against most grass weeds and also provides control of certain broadleaves (see weed control ratings for selected weeds in Table 2). When Zidua was used by itself, weed control improved as application rate increased from 2.0 to 4.0 to 6.0 oz/acre. Surprisingly, no potato crop injury was detected at the high 6.0 oz rate this season. If Zidua gets labeled for potatoes the best strategy of use will be to combine it with another herbicide, such as Sencor, to provide multiple modes of action and achieve consistent broad-spectrum weed control.

Table 3 presents different herbicide treatments utilizing League, a Group 2 ALS herbicide. League currently has a supplemental label for potatoes and is reported to have activity against several broadleaf weeds. This trial was conducted on a coarse sand soil with 1.7 percent organic matter and there was some evidence that League, when used

preemergence at the high 6.4 oz/acre rate, caused some stunting of potato vine growth and a slight yield reduction. Lower usage rates of 4.0 oz or less and postemergent applications showed no signs of crop injury. Weed control ratings revealed League provided poor grass control, excellent carpetweed control and fair control of annual morning glory used either PRE or POST. Unfortunately, weed populations of lambsquarter, purslane, pigweed, and some others were not uniform enough in trial area to get significant control ratings. Trial results show that League should be used with other complimentary herbicides. For example, the treatment using Dual II Magnum and Sencor

applied PRE followed with a POST application of League at 4.0 oz rate resulted in excellent weed control and high yield. Valent U.S.A. Corporation does recommend a 12 month crop rotation interval for corn and soybeans, which could limit League's usefulness on potatoes in some situations.

Acknowledgements

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Table 1. Herbicide product descriptions.

Herbicide	Formulation	Company	Active ingredient	MOA Group
Dual II Magnum	7.64 EC	Syngenta	s-metolachlor	15
League	75 WG	Valent	imazosulfuron	2
Sencor	75 DF	Bayer	metribuzin	5
Zidua	85 WG	BASF	pyroxasulfone	15

Table 2. Treatment comparison evaluating Zidua herbicide.

Herbicide treatment	Rate per acre	Application timing ¹	Total cwt/acre	Grass control ² (%)	Morning glory ² (%)	Carpet weed ² (%)	Overall weed control ³
Untreated Control	--	--	266.9	0	0	0	P
Zidua 1X	2.0 oz	PRE	329.9	76	44	79	F
Zidua 2X	4.0 oz	PRE	320.1	89	57	98	F/G
Zidua 3X	6.0 oz	PRE	319.2	89	77	93	G
Dual II Magnum	1.5 pt	PRE	317.2	82	26	44	F
Zidua	3.0 oz	PRE	313.8	93	78	100	G/E
Sencor	0.33 lb	PRE					
Dual II Magnum	1.5 pt	PRE	320.9	91	51	100	F/G
Sencor	0.33 lb	PRE					
LSD 5%			34.8	12	27	15	

¹PRE treatments applied April 25, POST treatments applied May 27 potatoes 12 in. tall.

²Percent weed control, counts taken May 26 before POST herbicide treatments.

³Overall visual weed control ratings before harvest on July 10, E = excellent, G = good, F = fair, P = poor.

Table 3. Treatment comparison evaluating League herbicide.

Herbicide treatment	Rate per acre	Application timing ¹	Total cwt/acre	Grass control ² (%)	Morning glory ² (%)	Carpet weed ² (%)	Overall weed control ³
Control	--	--	266.9	0	0	0	P
League	6.4 oz	PRE	310.8	55	83	100	F
Dual II Magnum	1.5 pt	PRE	303.8	84	60	100	G
League	6.4 oz	PRE					
Dual II Magnum	1.5 pt	PRE	284.5	95	93	100	E
League	6.4 oz	PRE					
Sencor	0.33 lb	PRE					
Dual II Magnum	1.5 pt	PRE	333.3	91	95	100	E
Sencor	0.33 lb	PRE					
League	4.0 oz	POST					
Dual II Magnum	1.5 pt	PRE	327.2	82	88	100	G/E
League	3.2 oz	PRE					
League	3.2 oz	POST					
Dual II Magnum	1.5 pt	PRE	323.3	96	73	67	G
League	4.0 oz	POST					
Dual II Magnum	1.5 pt	PRE	342.3	93	87	58	E
League	4.0 oz	POST					
Sencor	0.33 lb	POST					
LSD 5%			34.8	12	27	15	

¹PRE treatments applied April 25, POST treatments applied May 27 potatoes 12 in. tall.

²Percent weed control, counts taken May 26 before POST herbicide treatments.

³Overall visual weed control ratings taken before harvest on July 10, E = excellent, G = good, F = fair, P = poor.