

# HERBICIDE APPLICATION METHODS FOR CONTROL OF YELLOW NUTSEDGE IN ONION

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Ontario, OR, 2002

## Introduction

Yellow nutsedge is extremely competitive with onions and herbicide options for controlling yellow nutsedge in onions are limited. Dual Magnum is registered for controlling yellow nutsedge in onions grown in the Treasure Valley. Outlook has also been evaluated for this use. Dual Magnum has been applied in various ways and questions about the most effective application method led to this trial. This is the second year that we have conducted this trial.

## Methods

### ***Application Methods for Yellow Nutsedge Control***

This trial was conducted to determine the effects of application methods of Dual Magnum and Outlook on yellow nutsedge control and onion injury. The trial was established in a cooperators field heavily infested with yellow nutsedge. Plots were four rows wide and 27 ft long and arranged in a randomized complete block design with four replicates.

Dual Magnum at 1.3 lb ai/acre and Outlook at 0.64 lb ai/acre were applied as either a broadcast spray, a spray banded in the furrow, or sidedressed. In some treatments, initial applications of Dual Magnum or Outlook were followed with a second application of the same product or an application of Basagran at 1.0 lb ai/acre plus crop oil concentrate (COC) at 1.0 percent v/v. Basagran plus COC was also applied twice for comparison. Initial herbicide applications were made on May 15, and second applications were made on June 10. At the first application, onions had two to three leaves and the yellow nutsedge was 3 inches tall. At the second application, onions were 12 inches tall and the nutsedge was 8 inches tall. Nutsedge control and crop response were evaluated throughout the growing season. Onion yields were determined by harvesting the center two rows of each plot on August 14. Onions were graded by size on August 15.

Data were analyzed using analysis of variance procedures and means were separated using a protected least significant difference at the 5 percent level, LSD (0.05).

## Results and Discussion

Basagran applied to two-leaf onions caused 41 percent injury 7 days after the application (Table 1). Basagran applied on June 10 injured onions 33 to 50 percent at the June 17 evaluation. No significant injury was observed with any of the Dual Magnum or Outlook treatments regardless of application method with the exception of Dual Magnum applied twice broadcast, which had 18 percent injury on June 17. Under the dry growing conditions experienced this year, none of the treatments evaluated provided yellow nutsedge control that would be considered acceptable (Table 2). Yellow nutsedge control was greatest on May 23 and 30 with Basagran applied to two-leaf onions. On May 30, the sidedressed Outlook had slightly greater control than sidedressed Dual Magnum treatments. By June 7, some of the Outlook treatments had slightly higher nutsedge control than Dual Magnum treatments and were similar to the Basagran treatment. On July 8, treatments that received an application of Basagran on June 10 exhibited among the greatest yellow nutsedge control. Multiple applications of Outlook or Dual Magnum generally provided greater control than single applications but did not separate statistically ( $P = 0.05$ ). Overall differences among application methods were not apparent.

Onion yields were among the lowest with Basagran applied twice (Table 3). The high onion injury from Basagran applied to two-leaf onions reduced yields even though yellow nutsedge control was among the highest with this treatment. Dual Magnum or Outlook applied to two-leaf onions and followed by an application of Basagran, or two broadcast applications of Dual Magnum or Outlook were also among the highest yielding treatments. An interesting trend was that treatments with Dual Magnum or Outlook sidedressed followed by a second broadcast application appeared to yield less than those with two broadcast applications of Dual Magnum or Outlook. In the case of Outlook, the yield difference was statistically significant ( $P = 0.05$ ). This trend suggests that even though visual injury was not greater with sidedress applications, sidedressed Outlook or Dual Magnum may have moved into the root zone via furrow irrigation and been more available for uptake by the onion plants, resulting in reduced bulb size. Experiments in weed-free conditions could determine if sidedress applications of Dual Magnum and Outlook cause onion yield loss. Poor yellow nutsedge control with Dual Magnum and Outlook are likely attributable to the lack of rainfall, and the resulting lack of incorporation and activation of these herbicides.

Table 1. Onion injury in response to herbicide application methods, Malheur Experiment Station, Oregon State University, Ontario, OR, 2002.

Treatment	Rate	Timing*	Application	Onion injury				
				5-23	5-30	6-7	6-17	7-8
	lb ai/acre	leaf		-----%-----				
Dual Magnum	1.3	2-leaf	Sidedress	0	0	0	1	0
Outlook	0.64	2-leaf	Sidedress	0	0	0	6	0
Dual Magnum	1.3	2-leaf	Broadcast	0	0	0	4	0
Outlook	0.64	2-leaf	Broadcast	0	0	0	6	5
Dual Magnum	1.3	2-leaf	Band in furrow	0	0	0	1	0
Outlook	0.64	2-leaf	Band in furrow	0	0	0	6	0
Dual Magnum	1.3	2-leaf	Sidedress	0	0	0	4	6
Dual Magnum	1.3	24 DL	Broadcast					
Outlook	0.64	2-leaf	Sidedress	3	3	10	10	10
Outlook	0.64	24 DL	Broadcast					
Dual Magnum	1.3	2-leaf	Broadcast	0	0	0	18	4
Dual Magnum	1.3	24 DL	Broadcast					
Outlook	0.64	2-leaf	Broadcast	0	0	0	3	0
Outlook	0.64	24 DL	Broadcast					
Basagran + COC	1.0 + 1% v/v	2-leaf	Broadcast	41	31	8	50	9
Basagran + COC	1.0 + 1% v/v	24 DL	Broadcast					
Dual Magnum	0.64	2-leaf	Broadcast	0	0	0	40	1
Basagran + COC	1.0 + 1% v/v	24 DL	Broadcast					
Outlook	0.64	2-leaf	Broadcast	0	0	0	33	0
Basagran + COC	1.0 + 1% v/v	24 DL	Broadcast					
Dual Magnum + COC	1.3 + 1% v/v	2-leaf	Broadcast	0	0	0	4	0
Dual Magnum + COC	1.3 + 1% v/v	24 DL	Broadcast					
Outlook	0.64	2-leaf	Broadcast	0	0	0	0	0
Outlook	0.64	24 DL	Broadcast					
Untreated				0	0	0	0	0
LSD (0.05)				4	3	NS	11	NS

\* The first treatments were applied to 2-leaf onions on May 16 and the second treatments were applied 24 days later (DL) on June 10.

Table 2. Yellow nutsedge control in response to herbicide application methods in onions, Malheur Experiment Station, Oregon State University, Ontario, OR, 2002.

Treatment	Rate	Timing*	Application	Yellow nutsedge control				
				5-23	5-30	6-7	6-17	7-8
				-----%				
	lb ai/acre	leaf						
Dual Magnum	1.3	2-leaf	Sidedress	0	10	15	46	29
Outlook	0.64	2-leaf	Sidedress	0	19	13	46	19
Dual Magnum	1.3	2-leaf	Broadcast	5	12	18	39	34
Outlook	0.64	2-leaf	Broadcast	3	16	21	50	40
Dual Magnum	1.3	2-leaf	Band in furrow	0	16	26	47	37
Outlook	0.64	2-leaf	Band in furrow	0	13	21	46	34
Dual Magnum	1.3	2-leaf	Sidedress	0	13	23	44	53
Dual Magnum	1.3	24 DL	Broadcast					
Outlook	0.64	2-leaf	Sidedress	0	25	43	61	58
Outlook	0.64	24 DL	Broadcast					
Dual Magnum	1.3	2-leaf	Broadcast	0	8	14	36	45
Dual Magnum	1.3	24 DL	Broadcast					
Outlook	0.64	2-leaf	Broadcast	0	12	30	50	51
Outlook	0.64	24 DL	Broadcast					
Basagran + COC	1.0 + 1% v/v	2-leaf	Broadcast	43	35	25	89	58
Basagran + COC	1.0 + 1% v/v	24 DL	Broadcast					
Dual Magnum	0.64	2-leaf	Broadcast	0	14	23	89	73
Basagran + COC	1.0 + 1% v/v	24 DL	Broadcast					
Outlook	0.64	2-leaf	Broadcast	0	15	24	87	66
Basagran + COC	1.0 + 1% v/v	24 DL	Broadcast					
Dual Magnum + COC	1.3 + 1% v/v	2-leaf	Broadcast	0	10	25	54	51
Dual Magnum + COC	1.3 + 1% v/v	24 DL	Broadcast					
Outlook	0.64	2-leaf	Broadcast	0	16	31	49	38
Outlook	0.32	24 DL	Broadcast					
Untreated				0	5	0	0	0
LSD (0.05)				5	8	14	14	19

\*The first treatments were applied to 2-leaf onions on May 16 and the second treatments were applied 24 days later (DL) on June 10.

Table 3. Onion yield in response to herbicide application methods, Malheur Experiment Station, Oregon State University, Ontario, OR, 2002.

Treatment	Rate	Timing*	Application	Onion yield				
				Small	Medium	Jumbo	Colossal	Marketable
	lb ai/acre	leaf		-----%				
Dual Magnum	1.3	2-leaf	Sidedress	21	126	240	1	367
Outlook	0.64	2-leaf	Sidedress	22	94	277	0	370
Dual Magnum	1.3	2-leaf	Broadcast	13	69	260	3	331
Outlook	0.64	2-leaf	Broadcast	23	82	206	0	288
Dual Magnum	1.3	2-leaf	Band in furrow	17	68	337	5	411
Outlook	0.64	2-leaf	Band in furrow	17	98	294	7	399
Dual Magnum	1.3	2-leaf	Sidedress	26	101	209	0	310
Dual Magnum	1.3	24 DL	Broadcast					
Outlook	0.64	2-leaf	Sidedress	16	76	211	4	291
Outlook	0.64	24 DL	Broadcast					
Dual Magnum	1.3	2-leaf	Broadcast	19	65	311	6	382
Dual Magnum	1.3	24 DL	Broadcast					
Outlook	0.64	2-leaf	Broadcast	18	68	372	23	463
Outlook	0.64	24 DL	Broadcast					
Basagran + COC	1.0 + 1% v/v	2-leaf	Broadcast	17	71	173	0	244
Basagran + COC	1.0 + 1% v/v	24 DL	Broadcast					
Dual Magnum	0.64	2-leaf	Broadcast	13	56	369	3	428
Basagran + COC	1.0 + 1% v/v	24 DL	Broadcast					
Outlook	0.64	2-leaf	Broadcast	11	68	397	14	480
Basagran + COC	1.0 + 1% v/v	24 DL	Broadcast					
Dual Magnum + COC	1.3 + 1% v/v	2-leaf	Broadcast	10	51	325	26	402
Dual Magnum + COC	1.3 + 1% v/v	24 DL	Broadcast					
Outlook	0.64	2-leaf	Broadcast	15	70	322	5	397
Outlook	0.32	24 DL	Broadcast					
Untreated				27	92	169	0	261
LSD (0.05)				NS	37	138	14	144

\* The first treatments were applied to 2-leaf onions on May 16 and the second treatments were applied 24 days later (DL) on June 10.