Early Postemergence Herbicide Weed Control in Onions

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Abstract

Oxyfluorfen (Goal®) herbicide at 0.25 lb. a.i./A and bromoxynil (Buctril®) at 0.38 lb.a.i./A applied early postemergence (POST) to onions at the 1- to 2-leaf stage of growth gave near complete control (>98%) of lambsquarters, knotweed, cheeseweed, London rocket, and good control (~90%) of shepherd's purse. Buctril® did not control annual bluegrass and Goal® only slightly reduced some of the heavy population. Both herbicides caused marginally unacceptable onion injury at 17-20%. Buctril® plus pendimethalin (Prowl®) tank-mix combination applied POST also gave very good broadleaaved weed control but annual bluegrass was reduced only 50%. Similar onion injury was observed for the combination treatment as Buctril® alone. Buctril® caused onion injury when it was applied during cloudy weather. Buctril® and Goal® were effective for broadspectrum broadleaved weed control but onions were sensitive when treated before reaching the full 2-leaf stage of growth. Cloudy weather during applications also intensified the onion injury by Buctril® treatments.

Introduction

Onions are very slow growing and weeds compete effectively during all parts of the cropping season. Before onions reach the 2-leaf stage of growth when some postemergence (POST) herbicides are safe to use, weeds will often be larger and/or taller than onions. Oxyfluorfen (Goal®) and bromoxynil (Buctril®) herbicides are effective against broadleaved weeds when applied POST on small weeds after the onions are at the 2-leaf stage. Pendimethalin (Prowl®) is active on weeds as a preemergence herbicide but is to be applied after the 2-leaf stage also. Using these herbicides on small onions can result in severe crop injury or stand reduction. The objective of this field study was to evaluate and determine the weed control efficacy and crop safety of an early application of POST herbicides for use in dry bulb onions.

Materials and Methods

A small plot field study was conducted within a commercially grown onion field near Glendale, AZ. The field was seeded to dry bulb onions on 40-inch beds with 6 seedlines per bed. POST herbicide treatments were replicated four times in a randomized complete block design. Each plot consisted of two beds measuring 30 feet in length. All treatments were applied with a hand-held boom having four flat fan 8002 nozzles spaced 20-inches apart and delivered in 30 gallons per acre of water pressurized with a CO_2 backpack sprayer at 45 psi.

Goal® 1.6E, Buctril®, and Buctril® plus Prowl® 3.3EC treatments were applied when onions were at the 1-to 2-leaf stage of growth on December 22, 1994. Weeds present were *Poa annua* (annual bluegrass) as the predominate species at the 3-leaf stage, *Chenopodium album* (lambsquarters) at the 4-leaf stage, *Sisymbrium irio* (London rocket) at the 4-to 6-leaf stage, *Polygonum sp.* (knotweed) at the 3-leaf stage, and some *Sonchus sp.* (sowthistle) at the 3-leaf stage. Weather was overcast skies with a detectable wind and 72°F temperature.

Visual weed control and onion injury evaluations were made on February 1 after all treatment applications were made. Ratings were subjected to statistical analysis and means were separated by Duncan's Multiple Range Test.

Results and Discussion

At 6 weeks after treatment Goal ®at 0.25 lb.a.i./A, Buctril® at 0.38 lb. a.i./A, and Buctril® at 0.25 lb. a.i./A plus Prowl® at 1.0 lb.a.i./A gave near complete control (>98%) of lambsquarters, knotweed, cheeseweed, and London rocket (Table.). All treatments were also effective against shepherd's purse. Annual bluegrass was not controlled adequately by any treatment. Goal® slightly reduced the bluegrass compared to the untreated check. Buctril® did not have any effect against the grass and the addition of Prowl® only slightly showed an effect. Prowl® is effective against grass weeds when applied before emergence.

All treatments caused marginally unacceptable (>15%) onion injury. Buctril® injures onions when applied during cloudy weather conditions. Onions do not develop an adequate cuticle for protection from herbicides when weather conditions are not favorable. The Buctril® plus Prowl® treatment severely injured onions as both are to be applied to onions at the 2-leaf stage of growth. Goal® can also severely injure onions if applied before the 2-leaf stage of growth.

Goal® and Buctril® applied POST were extremely effective against the broadleaved weeds present and did not affect the annual bluegrass which is difficult to control. The rates used caused severe onion injury when applied before the full 2-leaf stage of growth and due to the adverse weather conditions at application time.

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Table. Postemergence herbicide weed control in onions near Glendale, AZ. (Umeda and Fredman)

Treatment	Rate (lb a.i./A)	% CSI	% Weed Control					
			POAAN	CAPBP	CHEAL	POLAV	MALPA	SSYIR
Untreated check		0 c	0 c	0 b	0 b	0 b	0 b	0 b
Goal®	0.25	17 b	73 a	90 a	99 a	99 a	99 a	99 a
Buctril®	0.38	20 ab	0 c	93 a	99 a	98 a	98 a	99 a
Buctril® + Prowl®	0.25 +1.0	22 a	50 b	91 a	99 a	99 a	99 a	99 a

POST treatments applied December 22, 1994.

Weed control rated on February 1, 1995.

CSI = crop stand injury

POAAN = annual bluegrass (*Poa annua*), CAPBP = shepherd's purse (*Capsella bursa-pastoris*), CHEAL = lambsquarters (*Chenopodium album*), POLAV = knotweed (*Polygonum sp.*), MALPA = cheeseweed (*Malva parviflora*), SSYIR = London rocket (*Sisymbrium irio*).

Means followed by the same letter in a column are not significantly different by Duncan's Multiple Range Test at the 5% level.