

Effect of Prowl and Prefar Herbicides on Onions

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Abstract

Significant onion height reduction was observed when Prowl (pendimethalin) and Prefar (bensulide) herbicide combinations were applied preemergence (PREE). The onions resumed growth but the height was still slightly reduced later in the growing season compared to the handweeded check and the standard herbicide treatment, Dacthal (DCPA). The onion crop stand emerged initially but later in the season, a significant crop stand reduction was observed for the higher rate of Prowl at 0.5 lb AI/A plus Prefar. A lower rate of Prowl at 0.25 lb AI/A plus Prefar also caused a reduction of the onion stand compared to the handweeded check or Dacthal.

Introduction

Field testing in recent years has shown that the combination of Prowl herbicide plus Prefar herbicide offered improved weed control of difficult to control weeds compared to either of the herbicides applied alone at higher rates of application. The herbicide combination has demonstrated good crop safety on furrow irrigated dry bulb onions but caused severe crop stand reduction when onions were overhead sprinkler irrigated. The effect and severity of rainfall on the performance and safety of the herbicides on dry bulb onions in desert production systems was not clear. This field test provided an opportunity to determine the impact of rainfall on Prowl plus Prefar performance on onions.

Materials and Methods

A small plot field test was conducted at the University of Arizona Maricopa Agricultural Center, Maricopa, AZ. Dry bulb onion cv. Colossal was direct seeded in two seedlines on 40-in wide raised beds. Each plot consisted of two beds measuring 35 ft in length and treatments were replicated three times and arranged in a randomized complete block design. The preemergence (PREE) herbicide treatments were applied using a CO₂ backpack sprayer equipped with a hand-held boom consisting of four flat fan 8002 nozzle tips spaced 20-in apart. The herbicides were sprayed in 20 gpa water pressurized to 30 psi. At the time of applications immediately after planting on 16 October 2000, the temperature was 90°F under clear skies and only a very slight breeze. The soil was dry with a temperature of 88°F near the surface and furrow irrigation water was applied on the following day to wet the beds completely across the surface. During the growing season, the onion crop was evaluated by collecting data for stand counts, plant height, and yields at harvest.

Results and Discussion

Significant onion height reduction was observed at 30 days after treatment (DAT) when Prowl and Prefar herbicide combinations were applied PREE (Table). The onions resumed growth but the height was still slightly reduced

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compared to the handweeded check and the standard herbicide treatment, Dacthal at 79 DAT. The onion crop stand emerged initially but at 79 DAT, a significant crop stand reduction was observed for the higher rate of Prowl at 0.5 lb AI/A plus Prefar. A lower rate of Prowl at 0.25 lb AI/A plus Prefar also caused a reduction of the onion stand compared to the handweeded check or Dacthal. At harvest, the total weight and the total number of onion bulbs were reduced in the harvested plot area. Due to a thinner stand in the Prowl 0.5 lb AI/A plus Prefar treated plot, onion bulbs were observed to be slightly larger in diameter and weight.

The observed injury on the onions could be attributed to the rainfall that occurred within one week after the applications that totaled nearly one inch. The onions were furrow irrigated to activate the herbicides but the additional rainfall moved the herbicides down to the zone of the germinating seedlings to cause the crop phytotoxicity. The total rainfall prior to the first evaluation at 30 DAT was nearly 2.5 inches. Previous field tests have demonstrated that onion injury resulted with overhead sprinkler irrigation following applications of Prowl and Prefar combinations. Water applied by only furrow irrigation did not cause significant crop injury in the previous testing.

Applications of overhead water by rainfall or sprinklers induce onion crop injury. Emerging seedlings are affected severely by Prowl plus Prefar to reduce crop stand and plant height. Label instructions should be carefully reviewed before using Prowl for onion weed control in desert soils.

List of References

Umeda, K., et al. 1999. Prowl and Prefar for Onion Weed Control. 1999 Vegetable Report, D. Byrne and P. Baciewicz, eds. College of Agriculture, Series P-117, August 1999. Cooperative Extension, Agricultural Experiment Station, The University of Arizona, Tucson, AZ 85721.

Table. Effect of Prowl and Prefar herbicides on onions

Treatment	Rate (lb AI/A)	Stand count		Onion Plant height		Yield	
		30 DAT	79 DAT	30 DAT	79 DAT	lb/10 ft	bulbs/10 ft
Handweeded check		129	116	2.2	3.1	27.1	309
Prowl + Prefar	0.25 + 6.0	108	95	1.4	2.7	18.2	214
Prowl + Prefar	0.5 + 6.0	107	87	1.3	2.7	24.1	193
Dacthal	10	131	120	2	3.1	31.2	306
LSD (p=0.05)		26.6	28.6	0.2	0.6	11.4	54.9

Onion stand count measured per 10 ft of row per plot.

Onion plant height measured per 10 plants per plot.