

# Comparison of Postemergence Grass Herbicides for Grass Weed Control

Kai Umeda

## Abstract

*Select (clethodim) and BAS-620 (BASF Corporation) at 0.1, 0.125, and 0.188 lb AI/A gave near complete control (99%) of watergrass at 8 days after treatment of the early application in watermelons and cantaloupes. Poast (sethoxydim) and Fusilade DX (fluazifop-p-butyl) offered nearly similar effective control of the watergrass with control ranging from 93 to 98%. Poast demonstrated a rate response with decreasing efficacy with decreasing rates of application. Fusilade and Poast at the high rate were comparable to Select and BAS-620 at the high rate. In lettuce, Select and BAS-620 performed similarly on large volunteer wheat with 97% control at about 3 weeks after treatment. Fusilade provided an acceptable level of control at 86% control. Poast did not provide any visible control of the volunteer wheat. Differences existed in the performance of the grass herbicides and optimal performance could be obtained with proper timing of application at effective rates and using effective adjuvants.*

## Introduction

Grass weeds are generally not very significant economic problems in many of the vegetable crops produced in the desert southwest. Soil-applied herbicides such as DCPA, bensulide, pronamide, and trifluralin offer adequate control of most grass weeds during the crop stand establishment period. In the event of escaping grass weeds that may occur, there are postemergence grass herbicides such as Poast®, Fusilade®, and Select® that offer effective control of most annual and perennial summer or winter grasses in vegetables. The herbicides have a common mode of action as fatty acid synthesis inhibitors. However, there are uniqueness in each of the herbicides for exceptional activity or lack of activity against specific grasses. These field experiments in melons and lettuce are a continuation of trials reported previously to compare and contrast the grass herbicide efficacy and crop safety.

## Materials and Methods

Small plot field tests were conducted at the University of Arizona Maricopa Agricultural Center, Maricopa, AZ during the summer and fall 2001. Watermelon cv. Calsweet and cantaloupe cv. Topmark were planted in adjacent single seedlines on alternate raised 40-in beds with a buffer row between the watermelon and cantaloupe using a 4-row air planter on 12 July 2001. *Echinochloa crus-galli* (barnyardgrass/watergrass) seed was scattered on the bed tops prior to furrow irrigating. Each sprayed treatment replicate was one bed measuring 25 ft in length. The experiment was established in a randomized complete design with three replicates. All treatments were applied with a backpack CO<sub>2</sub> sprayer equipped with a hand-held boom with two flat fan 8002 nozzle tips spaced 20-in apart. The sprays were applied in 24 gpa water pressurized to 30 psi. All treatments included a methylated seed oil adjuvant at 1 qt/A. Melons were treated at the cotyledon stage of growth on 19 July and the watergrass was at the 2-leaf stage of growth for the early timing of application for the grass herbicides. The air temperature was 96EF and the winds were calm and sky clear. The late timing of application for the grass herbicides was sprayed on 25 July when the melons were at the 2-leaf stage

of growth and the most of the watergrass had 4 leaves and measured 2 to 5-in height. The air temperature was 94EF with few scattered clouds and a breeze at 5 mph. The melon crop safety and watergrass control were visually rated at intervals after the applications.

A red leaf lettuce cultivar was planted on 6 September 2001 in two seedlines on a raised 40-in shaped bed and then furrow irrigated to initiate and maintain the crop during the season. The treated plots consisted of two beds measuring 70 ft long. The experiment was established as a randomized complete block design with four replicates. All treatments were applied with a backpack CO<sub>2</sub> sprayer equipped with a hand-held boom with four flat fan 8002 nozzle tips spaced 20-in apart. The sprays were applied in 23 gpa water pressurized to 30 psi. All treatments included a non-ionic adjuvant, Agri-dex, at 1 qt/A. Volunteer wheat was the dominant weed present in the lettuce at approximately one month after planting and was at the jointing stage and 8 to 10-in height. The herbicides were applied on 15 October when the lettuce was at the 3 to 5 leaf stage of growth. The weather was clear, 90EF, and negligible wind. The weed control and lettuce safety was visually evaluated at intervals after the application.

## Results and Discussion

Comparison of an early versus later application of the grass herbicides on melons demonstrated that Poast, Fusilade, Select, and BAS-620 gave similar effective control of watergrass. Select and BAS-620 at 0.1, 0.125, and 0.188 lb AI/A gave near complete control (99%) at 8 days after treatment of the early application (DAT-1) and remained effective through 18 DAT-1 (Table 1). Poast and Fusilade offered nearly similar effective control of the watergrass with control ranging from 93 to 98%. Poast demonstrated a rate response with decreasing efficacy with decreasing rates of application. Fusilade and Poast at the high rate were comparable to Select and BAS-620 at the high rate. At 12 DAT of the later application timing, all of the grass herbicides at all rates performed similarly. All of the grass herbicides were safe on both cantaloupes and watermelons.

In the lettuce trial, Select and BAS-620 performed similarly on the large volunteer wheat at the early rating date with acceptable activity at about 2 weeks after treatment (WAT) and then improving to 97% control at about 3 WAT (Table 2). Fusilade provided an acceptable level of control at 83 and 86% control at the two rating dates. Poast did not provide any visible control of the volunteer wheat in this experiment. The lack of activity on the large volunteer wheat was probably due to the ineffectual non-ionic adjuvant that was substituted for a crop oil concentrate adjuvant that is specified on the label. No injury was observed in the red leaf lettuce from the herbicide applications.

Select and BAS-620 exhibited the highest degree of efficacy against watergrass in melons and the large volunteer wheat in lettuce. During the summer in melons, both gave better than 98% control of watergrass within 8 DAT of either early or late applications. Fusilade and Poast at the later timing of application or at the high rate were comparable to Select and BAS-620 on watergrass. In the winter in lettuce, both gave better than 97% control of large volunteer wheat within 3 WAT.

Select and BAS-620 did not appear to be as rate sensitive as Poast or Fusilade that showed less efficacy at lower rates than higher rates. Select and BAS-620 did not appear to be affected by use of different adjuvants. Methylated seed oil and non-ionic adjuvants equally enhanced activity of both. Select and BAS-620 were equally effective against large weeds as small weeds, especially against volunteer wheat. Poast and Fusilade were comparable in activity against watergrass at less than the 4-leaf stage. Poast and Fusilade appear to be more effective with a crop oil concentrate added in place of a non-ionic adjuvant and when applications are made earlier on smaller weeds ranging from 2 to 4-leaf stage watergrass. Differences existed in the performance of the grass herbicides and optimal performance could be obtained with proper timing of application at effective rates and using effective adjuvants.

## References

Umeda, K, N. Lund, D. MacNeil, D. Roberts. 2001. Grass Weed Control in Melons. D.N. Byrne and P. Baciewicz, eds. 2001 Vegetable Report, University of Arizona, College of Agriculture and Life Sciences, AZ 1252, August 2001.

Table 1. Comparison of postemergence grass herbicides in melons

Treatment	Rate (lb AI/A)	Crop Injury		Weed Control*		
		Cantaloupe	Watermelon	8 DAT-1	18 DAT-1	12 DAT-2
		----- % -----		----- % -----		
Untreated check		0	0	0	0	0
Handweeded check		0	0	100	100	100
Poast	0.1	0	0	93	96	98
Poast	0.125	0	0	97	98	98
Poast	0.188	0	0	99	97	98
BAS-620	0.1	0	0	99	99	98
BAS-620	0.125	0	0	99	99	98
BAS-620	0.188	0	0	99	99	98
Select	0.1	0	0	99	99	98
Select	0.125	0	0	99	99	98
Select	0.188	0	0	99	99	98
Fusilade	0.1	0	0	97	97	97
Fusilade	0.125	0	0	97	96	98
Fusilade	0.188	0	0	98	99	97
<u>LSD (p=0.05)</u>		0	0	1.8	2.4	2.4

\* Barnyardgrass (*E. crus-galli*) dominant grass weed present

Table 2. Comparison of postemergence grass herbicides in lettuce

Treatment	Rate (lb AI/A)	Lettuce injury		Weed Control*	
		15 DAT	15 DAT	15 DAT	22 DAT
		%		----- % -----	
Untreated check		0	0	0	0
Poast	0.2	0	0	0	0
Fusilade	0.2	0	83	86	
BAS-620	0.2	0	86	97	
Select	0.2	0	89	97	
<u>LSD (p=0.05)</u>		0	3.1	2.3	

\* Volunteer wheat dominant weed present