

TOLERANCE OF SIX CLASSES OF DRY BEANS AND ADZUKI BEANS TO PREEMERGENCE AND POSTEMERGENCE APPLICATIONS OF PERMIT

Trial ID: DB01-06-ncwws
Conducted: Bean and Beet

Study Dir.: Christy Sprague/ Gary Powell
Investigator: Christy Sprague

Date Planted:	6/6/2006	Row Spacing:	30 IN
Variety:	See Comments	No. of Reps:	4
Population:	See Comments	% OM:	2.9
Soil Type:	Clay	pH:	8.0
Plot Size:	10 X 30 FT	Design:	SPLIT-PLOT

Tillage: Fall Chisel Plow, Spring Field Cultivate
Fertilizer: None at planting

Crop	Code	Common Name
1.	PHSVX	BEAN, DRY

Application Description

	A	B
Application Timing:	Pre	Post
Date Treated:	6/6/2006	6/30/2006
Time Treated:	5:30 pm	11:00 am
% Cloud Cover:	90	90
Air Temp., Unit:	80 F	77 F
% Relative Humidity:	30	44
Wind Speed/Unit/Dir:	6 mph SW	5 mph SW
Soil Temp., Unit:	72 F	70 F
Soil/Leaf Surface M:	5 -	5 5
Soil Moist (1=w 5=d):	5	5

Crop Stage at Each Application

	A	B
Crop Name:	PHSVX	PHSVX
Height (In.):	-	2nd trifo
Stage (L):	-	5-6"

Application Equipment

Appl	Sprayer	Speed	Nozzle	Nozzle	Nozzle	Nozzle	Boom			Carrier	PSI
	Type	MPH	Type	Size	Height	Spacing	Width	GPA	water		
A	Cub	3.8	AirMix	11003	20"	20"	120"	19	water	27	
B	Cub	3.8	AirMix	11003	24"	20"	120"	19	water	27	

Comments: Navy and Black bean planted at 6.1 seeds per foot.
 Small Red, Pinto and Great Northern planted at 5.1 seeds per foot.
 Kidney Bean planted a 4.8 seeds per foot.
 Adzuki bean planted at 90,000 seeds/acre.

Summary: Six classes of dry beans and adzuki beans were planted in 2005 and 2006 at the Saginaw Valley Bean and Beet Research Farm in St. Charles, Michigan to determine the tolerance of dry beans and adzuki bean to Permit (halosulfuron) applied preemergence (PRE) and postemergence (POST). Varieties of the different dry bean classes are as follows: 'Vista' navy beans, 'Jaguar' black beans, 'Merlot' small red beans, 'Othello' pinto beans, 'Chinook 2000' light red kidney beans, 'Matterhorn' great northern beans, and 'Erimo' adzuki beans. The plots were kept weed-free throughout the season. Visual injury, maturity ratings, and yield for PRE and POST applications of Permit were compared with an untreated control using contrast statements. Injury from PRE applications of Permit ranged from 6 to 19%, 30 d after planting (DAP) for all classes in 2005. Adzuki beans and the 'Chinook 2000' light red kidney beans exhibited the greatest injury. In 2006, only the adzuki beans were injured (9%). Injury consisted of stunting compared with the untreated control. Even though some stunting occurred with all classes in 2005 and only the adzuki beans in 2006, yields were only lower than the untreated control with 'Jaguar' black beans and 'Chinook 2000' light red kidney beans in 2005 ($\forall = 0.1$ level of significance). In both years, POST applications of Permit caused stunting and chlorosis to all classes. Injury 4 to 6 d after treatment (DAT) ranged from 21 to 48% in 2005 and 12 to 56% in 2006. By 12 to 14 DAT, most dry bean classes started to out grow the injury; however injury in the adzuki beans increased. In 2005, injury was also greater for the light red kidney beans, 12 DAT. In 2005 yield was lower than the untreated control with adzuki beans ($\forall = 0.05$), light red kidney beans, and black beans ($\forall = 0.1$). However, in 2006 adzuki bean was the only bean where a significant reduction of yield was observed (>45% yield reduction). Differences in precipitation between 2005 and 2006 demonstrated the differences in recovery rates from POST Permit injury to these different classes. Of all of the beans tested POST applications caused the greatest injury and yield reductions for adzuki beans, therefore POST applications of Permit should be avoided to this class. Caution should also be taken when applying Permit to black beans and light red kidney beans if conditions are not conducive for recovery from initial Permit injury.