

**Overlapping residuals for waterhemp control in dry edible beans**

Trial ID: DB03-22 Study Dir.: Sprague, Stiles, Powell  
 Conducted: Shiawassee County Investigator:

**Planting Date:** Jul-6-2022 **Row Spacing:** 30 IN  
**Variety:** 'Adams' black bean **No. of Reps:** 4  
**Population:** 109000 seeds/A **% OM:** 4  
**Soil Type:** CL clay loam **pH:** 6.9  
**Plot Size:** 10 X 25 FT **Study Design:** Randomized Complete Block (RCB)

**Tillage/Previous Crops:** Fall chisel plow; spring disk and soil finished.  
**Fertilizer:**

**Crop and Weed Description**

Weed	Code	Common Name	Scientific Name
1	AMATU	tall waterhemp	Amaranthus tuberculatus
Crop	Code	Common Name	
1	PHSVX	dry bean	

**Application Description**

	A	B
<b>Application Timing:</b>	PRE	POST
<b>Date Treated:</b>	Jun-14-2022	Jul-26-2022
<b>Time Treated:</b>	1:20 PM	11:45 AM
<b>% Cloud Cover:</b>	100	50
<b>Air Temp., Unit:</b>	74 F	73 F
<b>% Relative Humidity:</b>	77	55
<b>Wind Speed/Unit/Dir:</b>	3 MPH S	0 MPH
<b>Soil Temp, Unit:</b>	77 F	78 F
<b>Leaf Moist/Dew Presence (Y/N):</b>	N	N
<b>Soil Moist:</b>	2	5

**Crop Stage at Each Application**

	A	B
<b>Crop 1 Name:</b>	PHSVX	PHSVX
<b>Height:</b>		6-8 " (7)
<b>Stage:</b>		V2

**Weed Stage at Each Application**

	A	B
<b>Weed 1 Name:</b>	AMATU	AMATU
<b>Height:</b>	0.5-1 " (1)	1-3 " (2)
<b>Stage:</b>	2L-6L (4L)	6L-10L (8L)

**Application Equipment**

Appl	Sprayer	Ground	Nozzle	Nozzle	Nozzle	Nozzle	Boom	Spray	Carrier	Operation
	Type	Speed	Type	Size	Height	Spacing	Width	Volume		Pressure
A	CUB	3.8 MPH	AIXR	11003	20.0 "	20.0 "	100.0 "	19 GAL/AC	WATER	30 PSI
B	CUB	3.8 MPH	AIXR	11003	24.0 "	20.0 "	100.0 "	19 GAL/AC	WATER	30 PSI

**Comments:**

Waterhemp at this location is glyphosate- (Group 9) and ALS- (Group 2) resistant. The field was spring-soil finished early and glufosinate was applied prior to planting dry beans to control emerged waterhemp. Due to poor waterhemp control with the first application glufosinate, another application was made after dry bean emergence and the dry beans were replanted. GPS coordinates: 42°50'6.83"N; 84° 9'1.58"W

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 Protocol ID: DB03-22 Location: Shiawassee County Trial Year: 2022  
 Project ID: Project ID 2: Project ID 3:  
 Study Director: Sprague, Stiles, Powell Sponsor Contact:  
 Investigator (Creator): Christy Sprague

Pest Code	AMATU		AMATU		AMATU		C, PSHVX
	C, PSHVX	AMATU	C, PSHVX	AMATU	C, PSHVX	AMATU	
Crop Type, Code	Jul-26-2022	Jul-26-2022	Aug-2-2022	Aug-2-2022	Aug-9-2022	Aug-9-2022	Aug-30-2022
Rating Date							
Rating Type	injury	control	injury	control	injury	control	injury
Rating Unit/Min/Max	%, 0, 100	%, 0, 100	%, 0, 100	%, 0, 100	%, 0, 100	%, 0, 100	%, 0, 100
Trt-Eval Interval	42 DA-A	42 DA-A	7 DA-B	7 DA-B	14 DA-B	14 DA-B	35 DA-B
Number of Decimals	0	0	0	0	0	0	0

Trt No.	Treatment Name	Rate	Appl Unit	Appl Timing							
1	Reflex	1 pt/a		POST B	1	0	8	100	1	100	0
	Crop oil concentrate	1 % v/v		POST B							
	AMS	2.5 lb/gal		POST B							
2	Outlook	21 fl oz/a		POST B	0	0	18	100	8	100	0
	Reflex	1 pt/a		POST B							
	Crop oil concentrate	1 % v/v		POST B							
	AMS	2.5 lb/gal		POST B							
3	Dual II Magnum	2 pt/a		POST B	0	0	30	100	17	100	0
	Reflex	1 pt/a		POST B							
	Crop oil concentrate	1 % v/v		POST B							
	AMS	2.5 lb/gal		POST B							
4	Warrant	3 pt/a		POST B	0	0	10	100	4	100	0
	Reflex	1 pt/a		POST B							
	Crop oil concentrate	1 % v/v		POST B							
	AMS	2.5 lb/gal		POST B							
5	Untreated				0	0	0	0	0	0	0
6	Outlook	11 fl oz/a	PRE	A	0	99	3	98	6	100	0
	Outlook	10 fl oz/a	POST	B							
	Varisto	21 fl oz/a	POST	B							
	Crop oil concentrate	1 % v/v	POST	B							
	AMS	2.5 lb/gal	POST	B							
7	Dual II Magnum	1 pt/a	PRE	A	0	100	6	100	8	100	0
	Dual II Magnum	1 pt/a	POST	B							
	Varisto	21 fl oz/a	POST	B							
	Crop oil concentrate	1 % v/v	POST	B							
	AMS	2.5 lb/gal	POST	B							
8	Warrant	1.5 pt/a	PRE	A	1	98	0	100	3	100	0
	Warrant	1.5 pt/a	POST	B							
	Varisto	21 fl oz/a	POST	B							
	Crop oil concentrate	1 % v/v	POST	B							
	AMS	2.5 lb/gal	POST	B							
9	Reflex	1 pt/a	POST	B	0	0	17	100	9	100	0
	Varisto	21 fl oz/a	POST	B							
	Crop oil concentrate	1 % v/v	POST	B							
	AMS	2.5 lb/gal	POST	B							
10	Outlook	11 fl oz/a	PRE	A	0	97	19	100	12	100	0
	Outlook	10 fl oz/a	POST	B							
	Reflex	1 pt/a	POST	B							
	Varisto	21 fl oz/a	POST	B							
	Crop oil concentrate	1 % v/v	POST	B							
	AMS	2.5 lb/gal	POST	B							
11	Dual II Magnum	1 pt/a	PRE	A	0	99	25	100	13	100	0
	Dual II Magnum	1 pt/a	POST	B							
	Reflex	1 pt/a	POST	B							
	Varisto	21 fl oz/a	POST	B							
	Crop oil concentrate	1 % v/v	POST	B							
	AMS	2.5 lb/gal	POST	B							

Could not calculate LSD (% mean diff) for columns 7,10 because error mean square = 0.



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Pest Code	AMATU	AMATU	C, PSHVX	C, PSHVX
Crop Type, Code				
Rating Date	Aug-30-2022	Sep-27-2022	Oct-28-2022	Oct-28-2022
Rating Type	control	control	moisture	yield
Rating Unit/Min/Max	%, 0, 100	%, 0, 100	%, 0, 100	cwt/A, -, -
Trt-Eval Interval	35 DA-B	63 DA-B	154 DA-C	154 DA-C
Number of Decimals	0	0	1	1

Trt No.	Treatment Name	Rate	Appl Unit	Appl Timing	Appl Code				
1	Reflex	1 pt/a		POST	B	100	100	18.8	22.6
	Crop oil concentrate	1 % v/v		POST	B				
	AMS	2.5 lb/gal		POST	B				
2	Outlook	21 fl oz/a		POST	B	100	100	18.8	22.3
	Reflex	1 pt/a		POST	B				
	Crop oil concentrate	1 % v/v		POST	B				
	AMS	2.5 lb/gal		POST	B				
3	Dual II Magnum	2 pt/a		POST	B	100	100	18.8	23.0
	Reflex	1 pt/a		POST	B				
	Crop oil concentrate	1 % v/v		POST	B				
	AMS	2.5 lb/gal		POST	B				
4	Warrant	3 pt/a		POST	B	100	100	18.8	23.8
	Reflex	1 pt/a		POST	B				
	Crop oil concentrate	1 % v/v		POST	B				
	AMS	2.5 lb/gal		POST	B				
5	Untreated					0	0	18.8	14.2
6	Outlook	11 fl oz/a	PRE		A	99	99	18.8	23.6
	Outlook	10 fl oz/a	POST		B				
	Varisto	21 fl oz/a	POST		B				
	Crop oil concentrate	1 % v/v	POST		B				
	AMS	2.5 lb/gal	POST		B				
7	Dual II Magnum	1 pt/a	PRE		A	100	100	18.8	25.5
	Dual II Magnum	1 pt/a	POST		B				
	Varisto	21 fl oz/a	POST		B				
	Crop oil concentrate	1 % v/v	POST		B				
	AMS	2.5 lb/gal	POST		B				
8	Warrant	1.5 pt/a	PRE		A	99	99	18.8	26.2
	Warrant	1.5 pt/a	POST		B				
	Varisto	21 fl oz/a	POST		B				
	Crop oil concentrate	1 % v/v	POST		B				
	AMS	2.5 lb/gal	POST		B				
9	Reflex	1 pt/a	POST		B	100	100	18.8	19.9
	Varisto	21 fl oz/a	POST		B				
	Crop oil concentrate	1 % v/v	POST		B				
	AMS	2.5 lb/gal	POST		B				
10	Outlook	11 fl oz/a	PRE		A	100	100	18.8	21.5
	Outlook	10 fl oz/a	POST		B				
	Reflex	1 pt/a	POST		B				
	Varisto	21 fl oz/a	POST		B				
	Crop oil concentrate	1 % v/v	POST		B				
	AMS	2.5 lb/gal	POST		B				
11	Dual II Magnum	1 pt/a	PRE		A	100	100	18.8	21.8
	Dual II Magnum	1 pt/a	POST		B				
	Reflex	1 pt/a	POST		B				
	Varisto	21 fl oz/a	POST		B				
	Crop oil concentrate	1 % v/v	POST		B				
	AMS	2.5 lb/gal	POST		B				

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