

Overlapping residuals for waterhemp control in dry edible beans

Trial ID: DB06-25
 Conducted: Shiawassee Co. (Morrice)

Study Dir.: Sprague, Stiles
 Investigator: Christy Sprague

Planting Date: Jun-3-2025
Variety: 'Black Beard' black bean
Population: seeds/A
Soil Type: SCL sandy clay loam
Plot Size: 10 X 25 FT

Row Spacing: 30 IN
No. of Reps: 4
% OM: 2.6
pH: 6.3
Study Design: Randomized Complete Block (RCB)

Tillage/Previous Crops:

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
Application Timing:	PRE	POST
Date Treated:	Jun-3-2025	Jul-2-2025
Time Treated:	12:30 PM	9:30 AM
% Cloud Cover:	0	0
Air Temp., Unit:	80 F	75 F
% Relative Humidity:	53	64
Wind Speed/Unit/Dir:	10 MPH NE	4 MPH WSW
Soil Temp, Unit:	86 F	80 F
Leaf Moist/Dew Presence (Y/N):	N	N
Soil Moist:	3	5

Crop Stage at Each Application

	A	B
Crop 1 Name:	PHSVX	PHSVX
Height:		8-10 " (9)
Stage:		V3

Weed Stage at Each Application

	A	B
Weed 1 Name:	AMATU	AMATU
Height:		2-14 " (8)
Stage:		4-18L

Weed Density

	1
Date:	Jul-2-2025
Weed Name:	AMATU
Density:	9 FT2

Application Equipment

Appl	Sprayer Type	Ground Speed	Nozzle Type	Nozzle Size	Nozzle Height	Nozzle Spacing	Boom Width	Spray Volume	Carrier	Operation Pressure
A	CUB	3.8 MPH	AIXR	11003	18.0 "	20.0 "	100.0 "	19 GAL/AC	WATER	30 PSI
B	CUB	3.8 MPH	AIXR	11003	30.0 "	20.0 "	100.0 "	19 GAL/AC	WATER	30 PSI

Comments: The waterhemp population at this location is resistant to glyphosate- (Group 9) and ALS-inhibiting herbicides (Group 2).

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Rating Date					Jun-23-2025	Jun-23-2025	Jul-1-2025	Jul-1-2025	Jul-16-2025	Jul-23-2025	Aug-13-2025	
Rating Type					injury	control	injury	control	control	control	injury	
Rating Unit					%	%	%	%	%	%	%	
Crop Type, Code					C, PHSVX		C, PHSVX				C, PHSVX	
Pest Code						AMATU		AMATU	AMATU	AMATU		
Treatment Appl. Interval					20 DA-A	20 DA-A	28 DA-A	28 DA-A	14 DA-B	21 DA-B	42 DA-B	
Number of Decimals					0	0	0	0	0	0	0	
Trt No.	Treatment Name	Rate	Appl Unit	Appl Code	Timing							
1	Varisto	21 fl oz/a	B		POST	0	0	0	0	8	18	0
	Crop oil concentrate	1 % v/v	B		POST							
	AMS	2.5 lb/a	B		POST							
2	Outlook	14 fl oz/a	A		PRE	1	100	3	98	96	92	0
	Varisto	21 fl oz/a	B		POST							
	Crop oil concentrate	1 % v/v	B		POST							
	AMS	2.5 lb/a	B		POST							
3	Dual II Magnum	1.33 pt/a	A		PRE	3	100	1	99	97	95	0
	Varisto	21 fl oz/a	B		POST							
	Crop oil concentrate	1 % v/v	B		POST							
	AMS	2.5 lb/a	B		POST							
4	Warrant	3 pt/a	A		PRE	3	98	1	88	89	87	0
	Varisto	21 fl oz/a	B		POST							
	Crop oil concentrate	1 % v/v	B		POST							
	AMS	2.5 lb/a	B		POST							
5	Reflex	1 pt/a	B		POST	0	0	0	0	74	73	0
	Crop oil concentrate	1 % v/v	B		POST							
	AMS	2.5 lb/a	B		POST							
6	Outlook	14 fl oz/a	B		POST	0	0	0	0	84	81	0
	Reflex	1 pt/a	B		POST							
	Crop oil concentrate	1 % v/v	B		POST							
	AMS	2.5 lb/a	B		POST							
7	Dual II Magnum	1.33 pt/a	B		POST	0	0	0	0	91	84	0
	Reflex	1 pt/a	B		POST							
	Crop oil concentrate	1 % v/v	B		POST							
	AMS	2.5 lb/a	B		POST							
8	Warrant	3 pt/a	B		POST	0	0	0	0	93	85	0
	Reflex	1 pt/a	B		POST							
	Crop oil concentrate	1 % v/v	B		POST							
	AMS	2.5 lb/a	B		POST							
9	Untreated					0	0	0	0	0	0	0
10	Outlook	11 fl oz/a	A		PRE	1	100	0	96	98	95	0
	Outlook	10 fl oz/a	B		POST							
	Varisto	21 fl oz/a	B		POST							
	Crop oil concentrate	1 % v/v	B		POST							
	AMS	2.5 lb/a	B		POST							
11	Dual II Magnum	1 pt/a	A		PRE	1	100	2	100	100	100	0
	Dual II Magnum	1 pt/a	B		POST							
	Varisto	21 fl oz/a	B		POST							
	Crop oil concentrate	1 % v/v	B		POST							
	AMS	2.5 lb/a	B		POST							
12	Warrant	1.5 pt/a	A		PRE	2	90	0	76	81	80	0
	Warrant	1.5 pt/a	B		POST							
	Varisto	21 fl oz/a	B		POST							
	Crop oil concentrate	1 % v/v	B		POST							
	AMS	2.5 lb/a	B		POST							
13	Reflex	1 pt/a	B		POST	0	0	0	0	76	78	0
	Varisto	21 fl oz/a	B		POST							
	Crop oil concentrate	1 % v/v	B		POST							
	AMS	2.5 lb/a	B		POST							

Could not calculate LSD (% mean diff) or mean separation letters for columns 7 because error variance is 0.
Mean separation letters are 'na' (not applicable) when error variance is 0

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Rating Date					Jun-23-2025	Jun-23-2025	Jul-1-2025	Jul-1-2025	Jul-16-2025	Jul-23-2025	Aug-13-2025	
Rating Type					injury	control	injury	control	control	control	injury	
Rating Unit					%	%	%	%	%	%	%	
Crop Type, Code					C, PHSVX		C, PHSVX				C, PHSVX	
Pest Code						AMATU		AMATU	AMATU	AMATU		
Treatment Appl. Interval					20 DA-A	20 DA-A	28 DA-A	28 DA-A	14 DA-B	21 DA-B	42 DA-B	
Number of Decimals					0	0	0	0	0	0	0	
Trt No.	Treatment Name	Rate	Appl Unit	Appl Code	Appl Timing							
14	Outlook	11 fl oz/a	A	PRE		3	100	2	96	100	100	0
	Outlook	10 fl oz/a	B	POST								
	Reflex	1 pt/a	B	POST								
	Varisto	21 fl oz/a	B	POST								
	Crop oil concentrate	1 % v/v	B	POST								
	AMS	2.5 lb/a	B	POST								
15	Dual II Magnum	1 pt/a	A	PRE		2	100	1	97	100	100	0
	Dual II Magnum	1 pt/a	B	POST								
	Reflex	1 pt/a	B	POST								
	Varisto	21 fl oz/a	B	POST								
	Crop oil concentrate	1 % v/v	B	POST								
	AMS	2.5 lb/a	B	POST								
16	Warrant	1.5 pt/a	A	PRE		1	92	0	78	99	97	0
	Warrant	1.5 pt/a	B	POST								
	Reflex	1 pt/a	B	POST								
	Varisto	21 fl oz/a	B	POST								
	Crop oil concentrate	1 % v/v	B	POST								
	AMS	2.5 lb/a	B	POST								
LSD P=.05						2.6	4.8	2.4	5.3	9.9	10.2	.
Standard Deviation						1.8	3.3	1.7	3.7	7.0	7.2	0.0
CV						191.04	6.08	279.14	7.26	8.67	9.09	0.0

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Rating Date	Aug-13-2025	Oct-10-2025
Rating Type	control	control
Rating Unit	%	%
Crop Type, Code		
Pest Code	AMATU	AMATU
Treatment Appl. Interval	42 DA-B	100 DA-B
Number of Decimals	0	0

Trt No.	Treatment Name	Rate	Unit	Appl Code	Appl Timing		
1	Varisto	21 fl oz/a	B		POST	3	3
	Crop oil concentrate	1 % v/v	B		POST		
	AMS	2.5 lb/a	B		POST		
2	Outlook	14 fl oz/a	A		PRE	83	84
	Varisto	21 fl oz/a	B		POST		
	Crop oil concentrate	1 % v/v	B		POST		
	AMS	2.5 lb/a	B		POST		
3	Dual II Magnum	1.33 pt/a	A		PRE	89	85
	Varisto	21 fl oz/a	B		POST		
	Crop oil concentrate	1 % v/v	B		POST		
	AMS	2.5 lb/a	B		POST		
4	Warrant	3 pt/a	A		PRE	73	79
	Varisto	21 fl oz/a	B		POST		
	Crop oil concentrate	1 % v/v	B		POST		
	AMS	2.5 lb/a	B		POST		
5	Reflex	1 pt/a	B		POST	64	61
	Crop oil concentrate	1 % v/v	B		POST		
	AMS	2.5 lb/a	B		POST		
6	Outlook	14 fl oz/a	B		POST	68	61
	Reflex	1 pt/a	B		POST		
	Crop oil concentrate	1 % v/v	B		POST		
	AMS	2.5 lb/a	B		POST		
7	Dual II Magnum	1.33 pt/a	B		POST	75	78
	Reflex	1 pt/a	B		POST		
	Crop oil concentrate	1 % v/v	B		POST		
	AMS	2.5 lb/a	B		POST		
8	Warrant	3 pt/a	B		POST	76	76
	Reflex	1 pt/a	B		POST		
	Crop oil concentrate	1 % v/v	B		POST		
	AMS	2.5 lb/a	B		POST		
9	Untreated					0	0
10	Outlook	11 fl oz/a	A		PRE	95	93
	Outlook	10 fl oz/a	B		POST		
	Varisto	21 fl oz/a	B		POST		
	Crop oil concentrate	1 % v/v	B		POST		
	AMS	2.5 lb/a	B		POST		
11	Dual II Magnum	1 pt/a	A		PRE	100	100
	Dual II Magnum	1 pt/a	B		POST		
	Varisto	21 fl oz/a	B		POST		
	Crop oil concentrate	1 % v/v	B		POST		
	AMS	2.5 lb/a	B		POST		
12	Warrant	1.5 pt/a	A		PRE	69	68
	Warrant	1.5 pt/a	B		POST		
	Varisto	21 fl oz/a	B		POST		
	Crop oil concentrate	1 % v/v	B		POST		
	AMS	2.5 lb/a	B		POST		
13	Reflex	1 pt/a	B		POST	65	53
	Varisto	21 fl oz/a	B		POST		
	Crop oil concentrate	1 % v/v	B		POST		
	AMS	2.5 lb/a	B		POST		

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Rating Type					control	control	
Rating Unit					%	%	
Crop Type, Code							
Pest Code					AMATU	AMATU	
Treatment Appl. Interval					42 DA-B	100 DA-B	
Number of Decimals					0	0	
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	Appl Timing		
14	Outlook	11 fl oz/a	A	PRE		100	96
	Outlook	10 fl oz/a	B	POST			
	Reflex	1 pt/a	B	POST			
	Varisto	21 fl oz/a	B	POST			
	Crop oil concentrate	1 % v/v	B	POST			
	AMS	2.5 lb/a	B	POST			
15	Dual II Magnum	1 pt/a	A	PRE		100	100
	Dual II Magnum	1 pt/a	B	POST			
	Reflex	1 pt/a	B	POST			
	Varisto	21 fl oz/a	B	POST			
	Crop oil concentrate	1 % v/v	B	POST			
	AMS	2.5 lb/a	B	POST			
16	Warrant	1.5 pt/a	A	PRE		90	88
	Warrant	1.5 pt/a	B	POST			
	Reflex	1 pt/a	B	POST			
	Varisto	21 fl oz/a	B	POST			
	Crop oil concentrate	1 % v/v	B	POST			
	AMS	2.5 lb/a	B	POST			
LSD P=.05						9.9	10.6
Standard Deviation						6.9	7.4
CV						9.68	10.59

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