



Effect of irrigation timing on preemergence herbicide efficacy and crop injury

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Chemical weed control in dry bean

Product ¹ (group #)	Application timing
Sandea (2)	PRE
Sonalan (3)	PRE
Treflan (3)	PRE
Prowl H ₂ O (3)	PRE
Eptam (8/15)	PRE
Chateau EZ (14) ²	PRE
Outlook (15)	PRE
Dual Magnum (15)	PRE
Raptor (2)	POST
Pursuit (2)	POST
Basagran (6)	POST
Varisto (2 & 6)	POST

¹There are postemergence grass herbicides labeled for beans including Select, Poast, Assure, etc

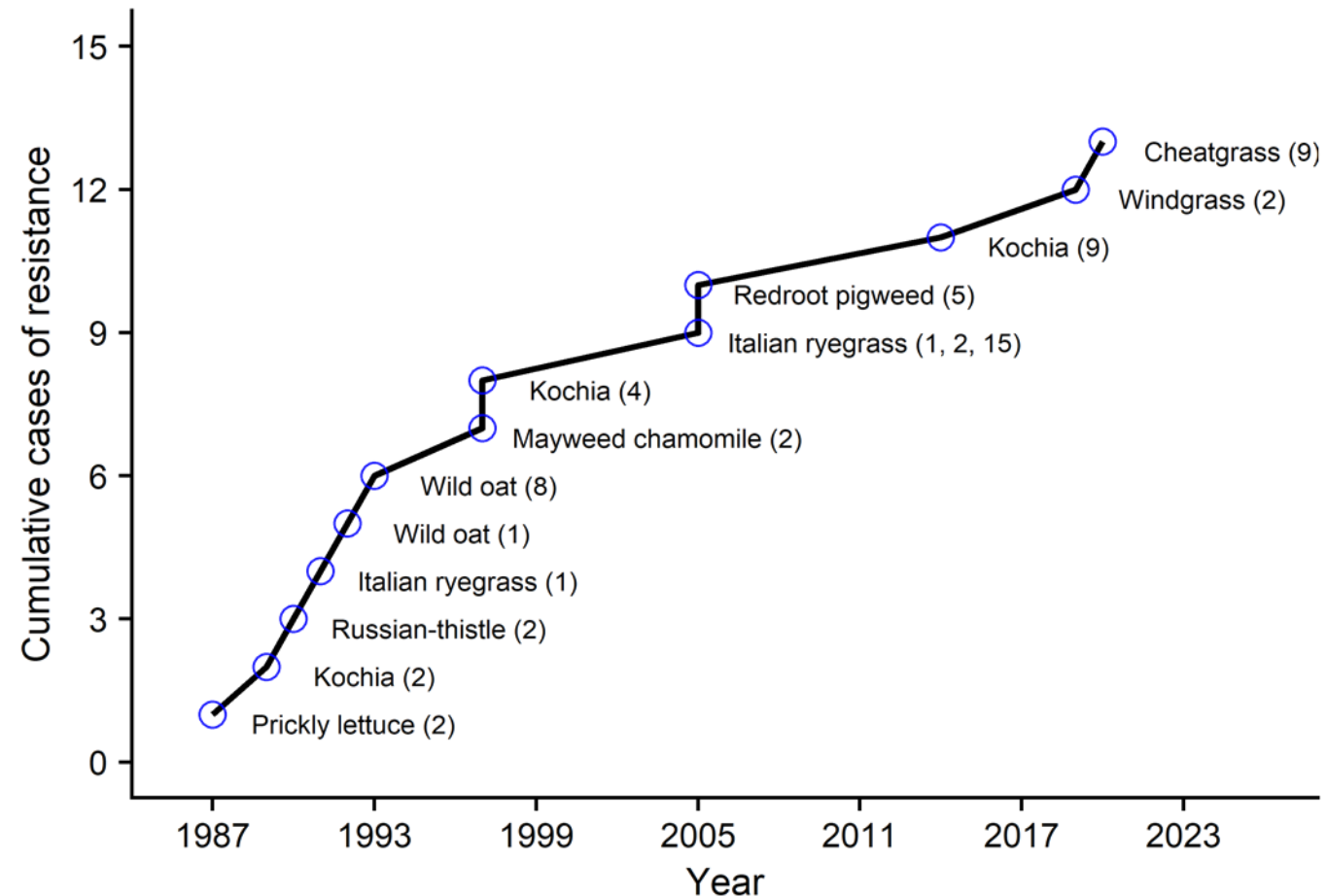
²Recently registered

Chemical weed control and herbicide resistance



- There are few herbicides labeled for garden and dry beans
- Most of the herbicides rarely provide good control of broadleaf weeds
- Repeated use of the same herbicides could increase the risk of herbicide resistance
- There's a need to find alternative herbicides or management strategies

Chronology of herbicide resistance in Idaho





Valor, Zidua, and Fierce herbicides

Valor [®] (14)	Zidua [®] (15)	Fierce [®] (14 & 15)
-----Weeds controlled-----		
Foxtail	Foxtail	Foxtail
Barnyardgrass	Barnyardgrass	Barnyardgrass
Lambsquarters	Lambsquarters	Lambsquarters
Black nightshade	Black nightshade	Black nightshade
Redroot pigweed	Redroot pigweed	Redroot pigweed
Hairy nightshade		Hairy nightshade
Kochia		Kochia
Mallow		Mallow

Flumioxazin (Chateau/Valor)



GROUP 14 HERBICIDE

NET WEIGHT 2-1/2 POUNDS

Active Ingredient	By Wt
Flumioxazin*	51.0%
Other Ingredients	49.0%
Total	100.0%

* 2-[7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2H-1,4-benzoxazin-6-yl]-4,5,6,7-tetrahydro-1H-isoindole-1,3(2H)-dione
Chateau® Herbicide SW is a water dispersible granule containing 51% active ingredient.

EPA Reg. No. 59639-99
EPA Est. 11773-IA-1[®], 39578-TX-1[®]
Superscript is first letter of lot number.

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

SEE NEXT PAGE FOR ADDITIONAL PRECAUTIONARY STATEMENTS

FOR CONTROL AND/OR SUPPRESSION OF CERTAIN WEEDS IN ALFALFA, ARTICHOKE, ASPARAGUS, BUSHBERRIES, CELERY, COTTON, FIELD CORN, GARLIC, GRAPE, HOPS, MINT, NUT TREES (INCLUDING PISTACHIO), OLIVE, ONION (DRY BULB), POME FRUIT, POMEGRANATE, STONE FRUIT, STRAWBERRY, SWEET POTATO, NON-BEARING FRUIT TREES, FALLOW LAND AND TO MAINTAIN BARE GROUND ON NON-CROP AREAS OF FARMS, ORCHARDS AND VINEYARDS.



CHATEAU®

H E R B I C I D E S W



(01) 0 06 53204 07482 9

Form 1487-K

FLUMIOXAZIN GROUP 14 HERBICIDE

NET CONTENTS 1 GALLON

FOR CONTROL AND/OR SUPPRESSION OF CERTAIN WEEDS IN ALFALFA; ARTICHOKE; ASPARAGUS; BUSHBERRIES; CANEBERRIES; CELERY; CITRUS FRUIT; CLOVER; COTTON; DRY BEANS; FIELD CORN; GARLIC; GRAPE; HOPS; MINT; ONION (DRY BULB); OLIVE; POME FRUIT; POMEGRANATE; POTATO; STONE FRUIT; STRAWBERRY; SWEET POTATO; TREE NUTS; NON-BEARING FRUIT TREES; FALLOWBED USE ON TRANSPLANTED PEPPER, AND TOMATO BEDS; FALLOW LAND AND TO MAINTAIN BARE GROUND ON NON-CROP AREAS OF FARMS; ORCHARDS AND VINEYARDS.

Active Ingredient	By Wt
Flumioxazin*	41.4%
Other Ingredients	58.6%
Total	100.0%

* 2-[7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2H-1,4-benzoxazin-6-yl]-4,5,6,7-tetrahydro-1H-isoindole-1,3(2H)-dione

Chateau® EZ Herbicide is a suspension concentrate containing 41.4% active ingredient.

EPA Reg. No. 59639-221
EPA Est. 11773-IA-1[®], 228-IL-1[®], 39578-TX-1[®], 5481-ID-1[®], 62171-MS-1[®], 70815-GA-2[®]
Superscript is first letter of lot number.

KEEP OUT OF REACH OF CHILDREN

SEE NEXT PAGE FOR ADDITIONAL PRECAUTIONARY STATEMENTS.



CHATEAU® EZ

H E R B I C I D E

Valor[®], Zidua[®], and Fierce[®] herbicides



Injury from Valor[®], Zidua[®], and Fierce[®] is influenced by:

1. Market class or seed size
 2. Timing of activation rainfall/irrigation
 3. Soil moisture
-

Objectives

1. Assess the effect of irrigation timing on residual weed control with Valor[®], Zidua[®], or Fierce[®] in dry bean
 2. Assess the effect of irrigation timing on Valor[®], Zidua[®], or Fierce[®] injury in dry bean
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Experimental design and treatments

1	Untreated
2	Zidua; irrigation at 1 DAT ¹
3	Zidua; irrigation at 4 DAT
4	Zidua; irrigation at 8 DAT
5	Valor SX; irrigation at 1 DAT
6	Valor SX; irrigation at 4 DAT
7	Valor SX; irrigation at 8 DAT
8	Fierce EZ; irrigation at 1 DAT
9	Fierce EZ; irrigation at 4 DAT
10	Fierce EZ; irrigation at 8 DAT
11	Eptam; irrigation at 1 DAT
12	Eptam; irrigation at 4 DAT
13	Eptam; irrigation at 8 DAT
14	Hand-weeded control

Design

- Randomized complete block
- Four replications

Planting and plot size:

Pinto bean (“Othello”) planted in 22-inch rows on June 4, 2021

Plot size: 15 ft wide (8 rows) by 30 feet long.

Herbicide application timing:

Preemergence (6/4/21)

Varisto: all plots except the untreated and hand-weeded check on July 14, 2021

¹DAT = Day(s) after herbicide treatment

Sprinkler irrigation set up



Data collection

- Stand count
 - Crop response rating (0 to 100%)
 - Weed control rating (0 to 100%)
 - Weed count*
 - Seed yield
-

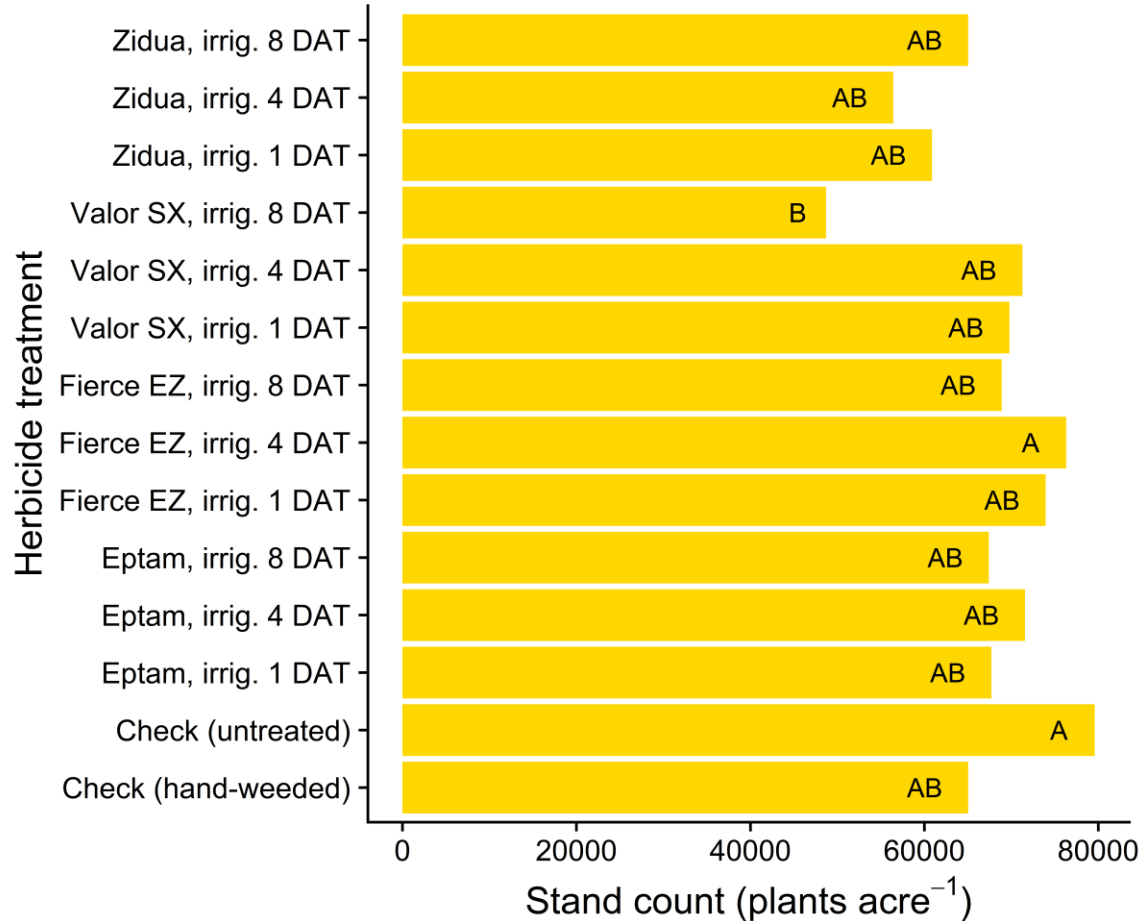
Dry bean stand count



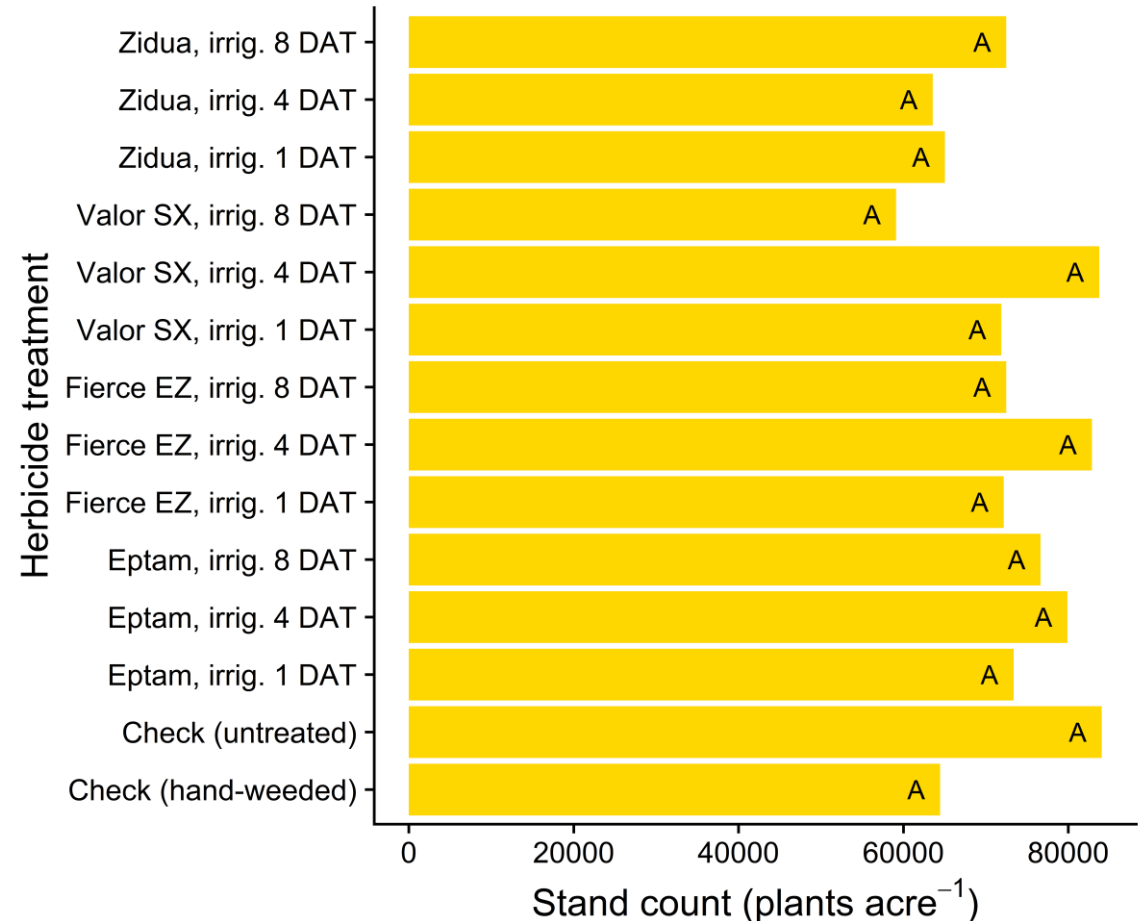


Dry bean stand count

June 15, 2021



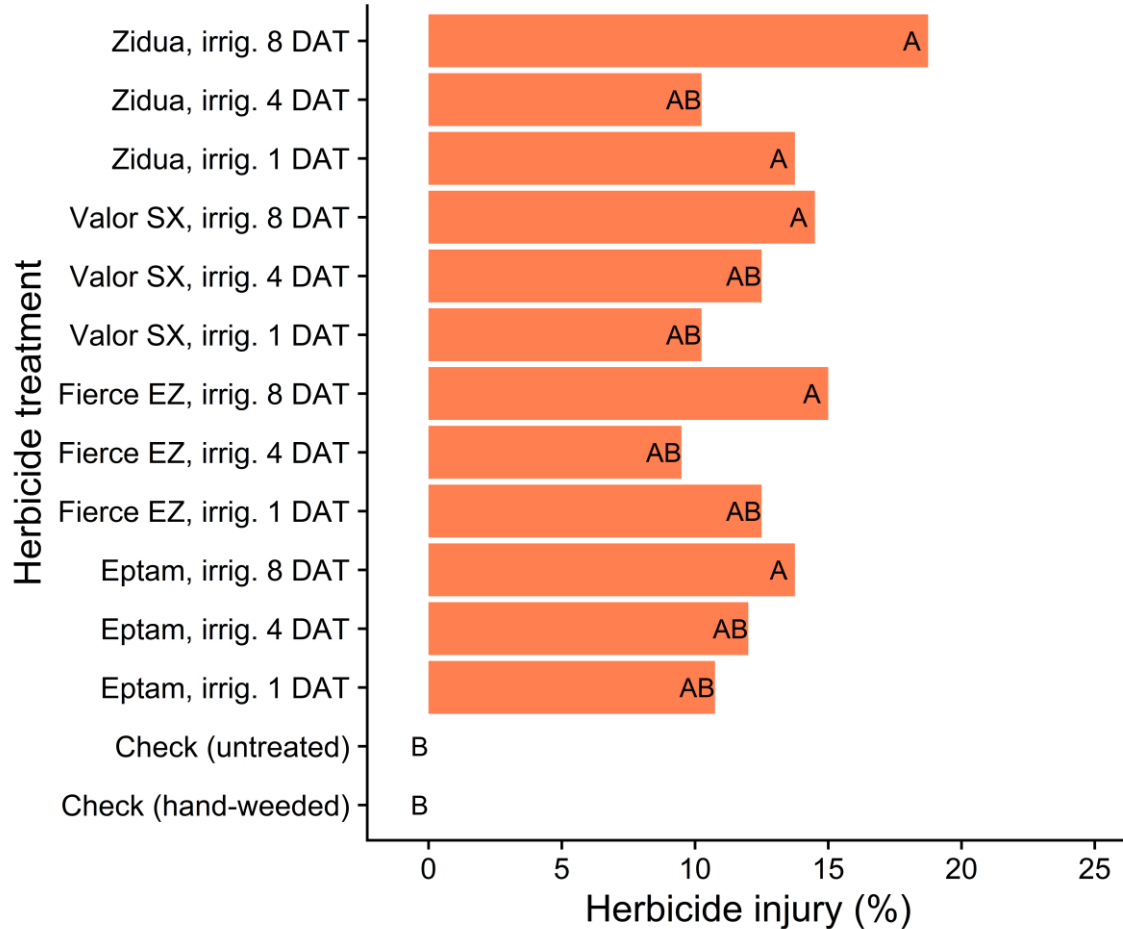
July 6, 2021



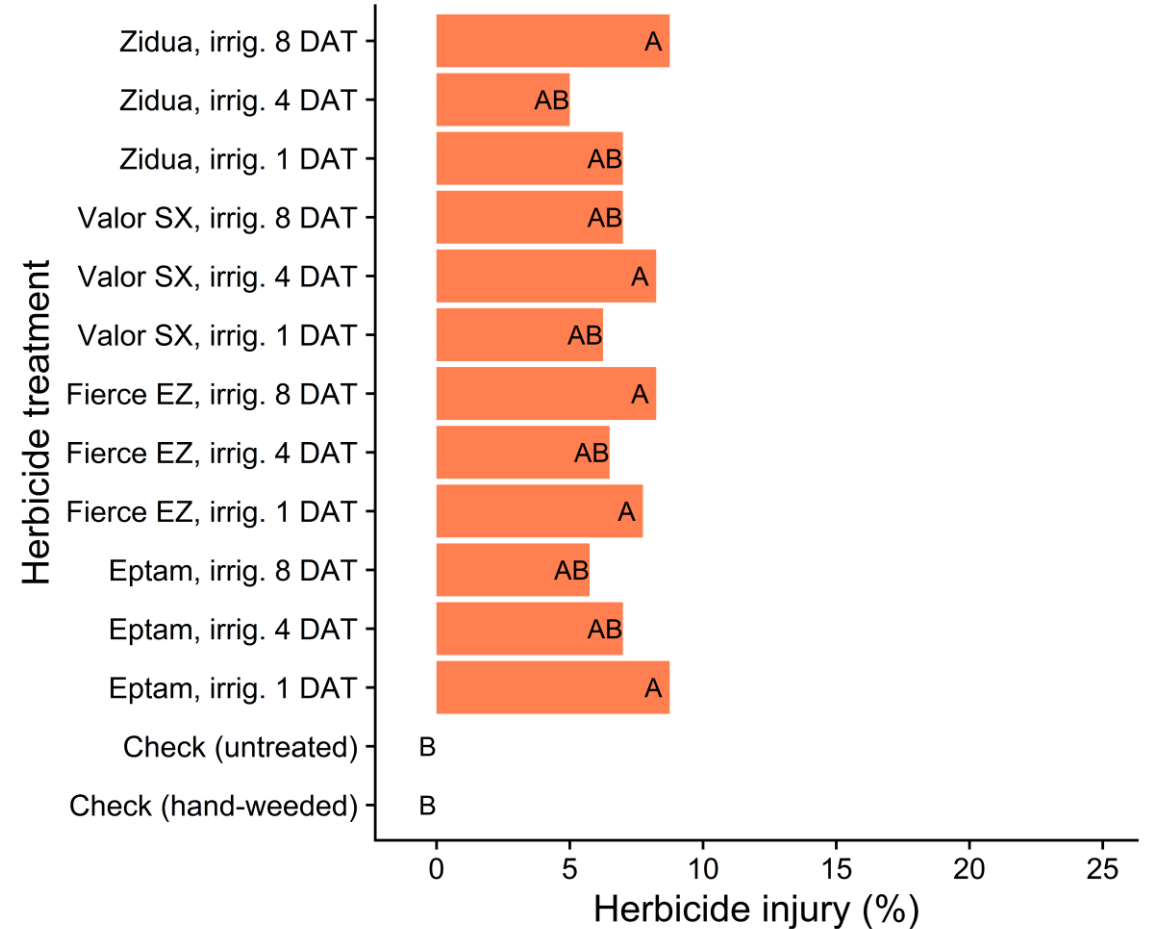


Visible herbicide injury

June 23, 2021



July 6, 2021

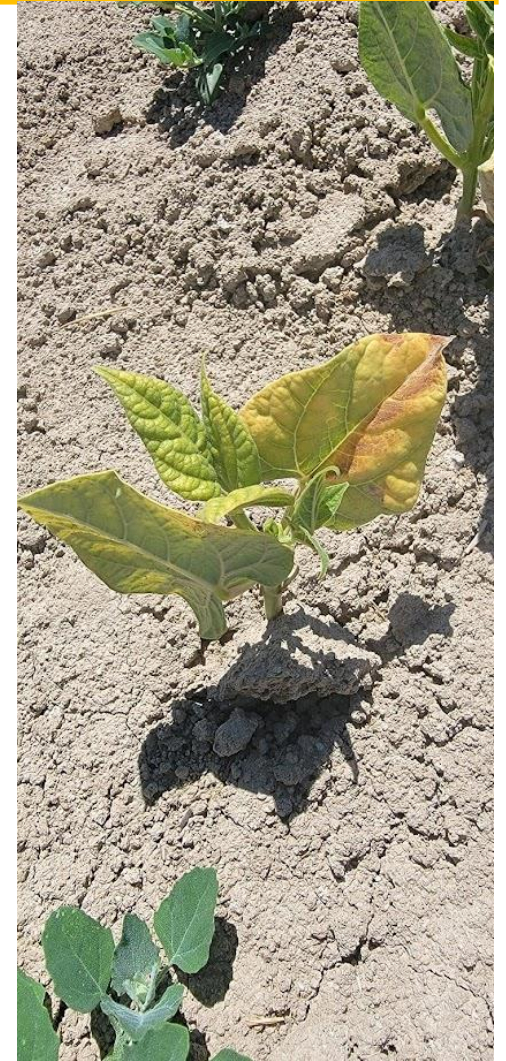


Herbicide injury: Fierce® or Valor®



Typical symptoms:

- necrosis (burn spots)
- bronzing of leaves
- girdled and shriveled stems on seedlings



Herbicide injury: Eptam[®], Fierce[®], Zidua[®]



Typical symptoms:

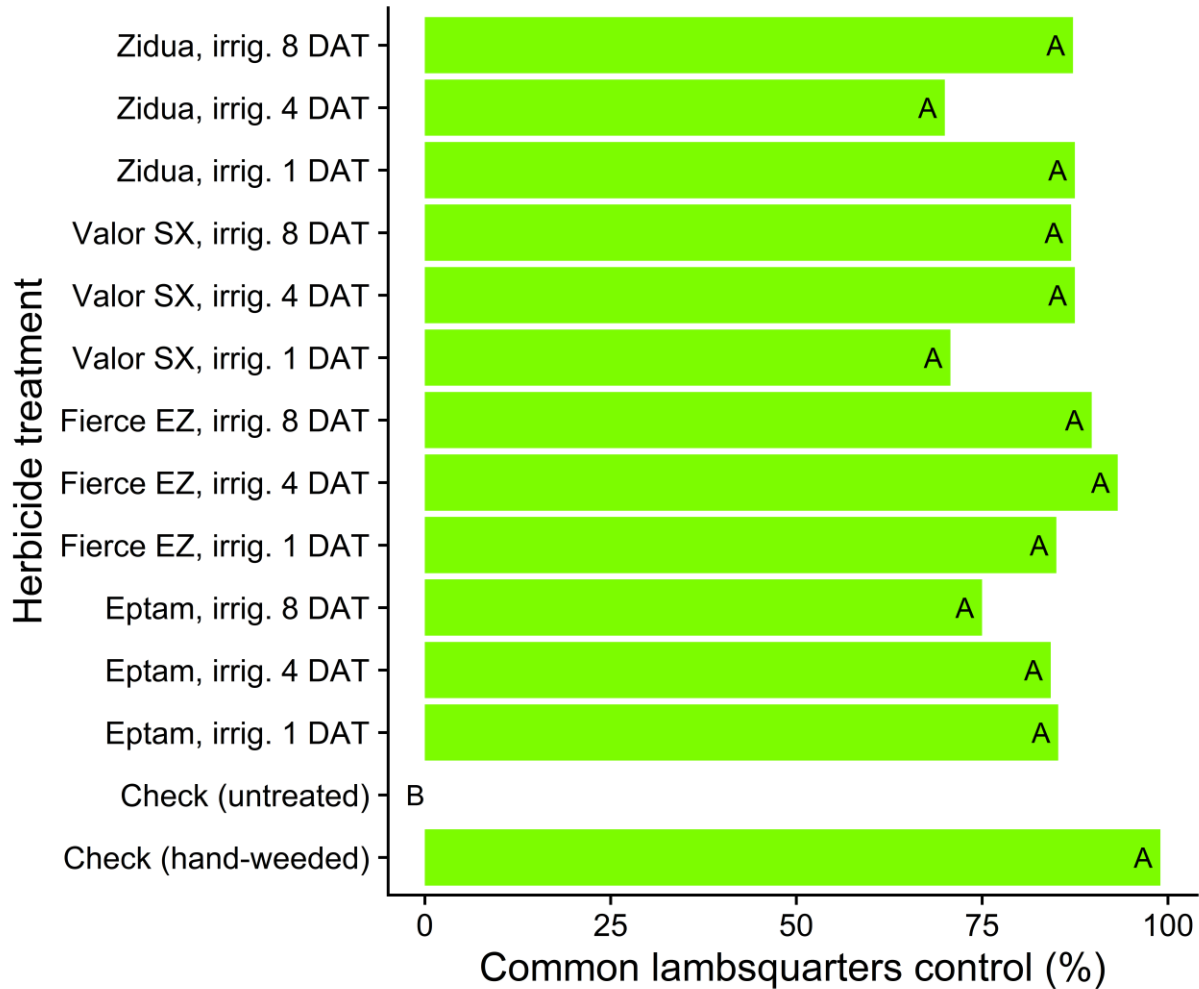
- Stunting
- Cupping of leaves



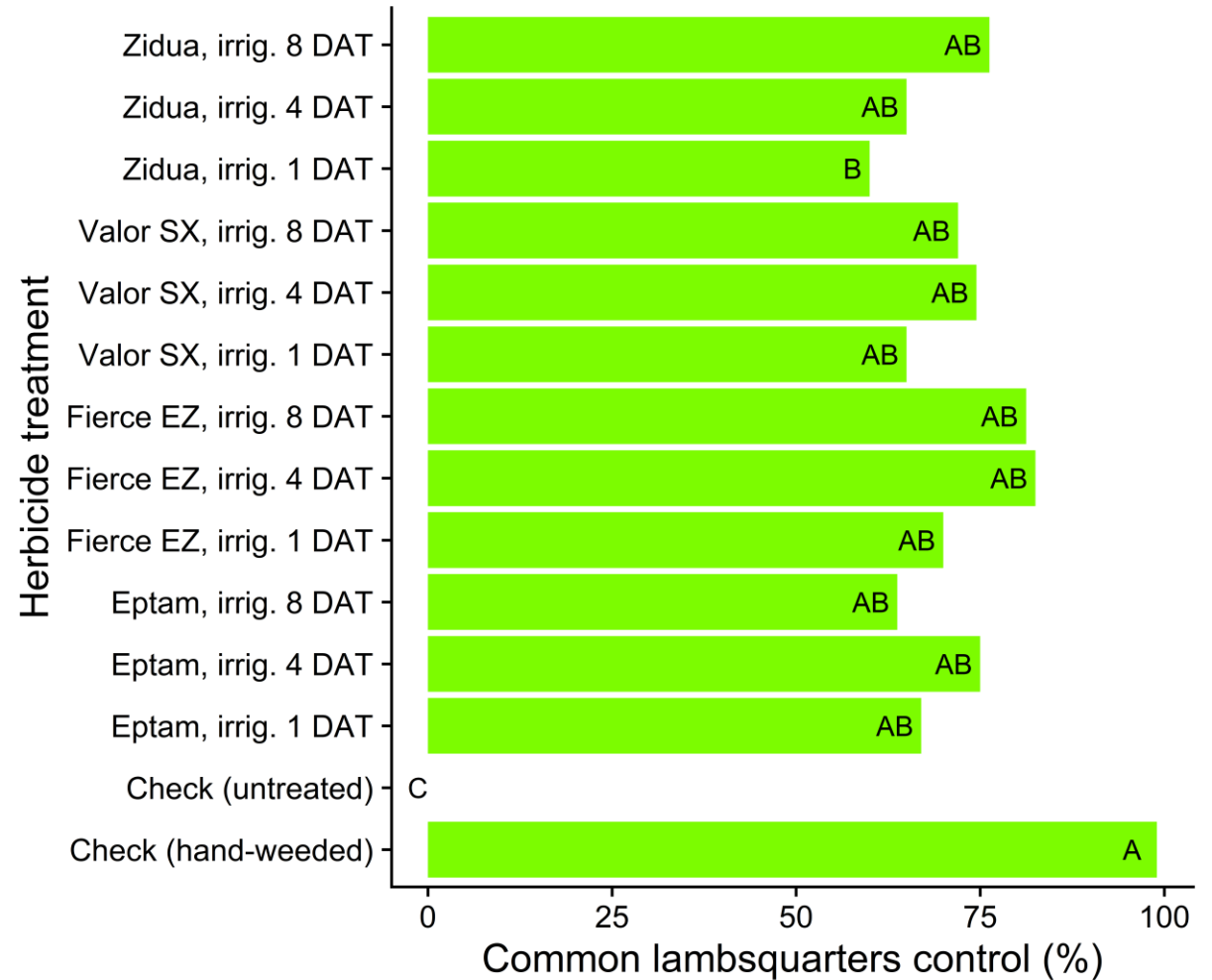


Common lambsquarters control

June 23, 2021



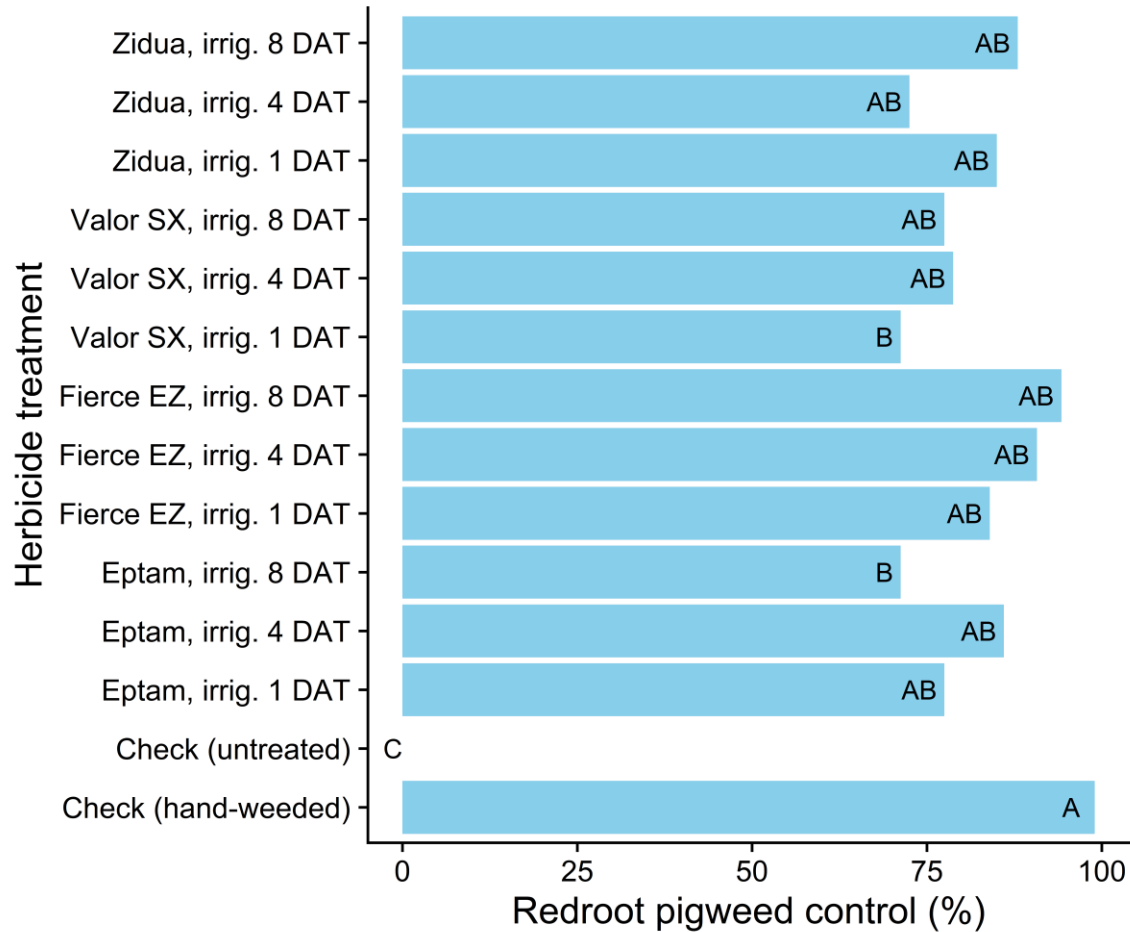
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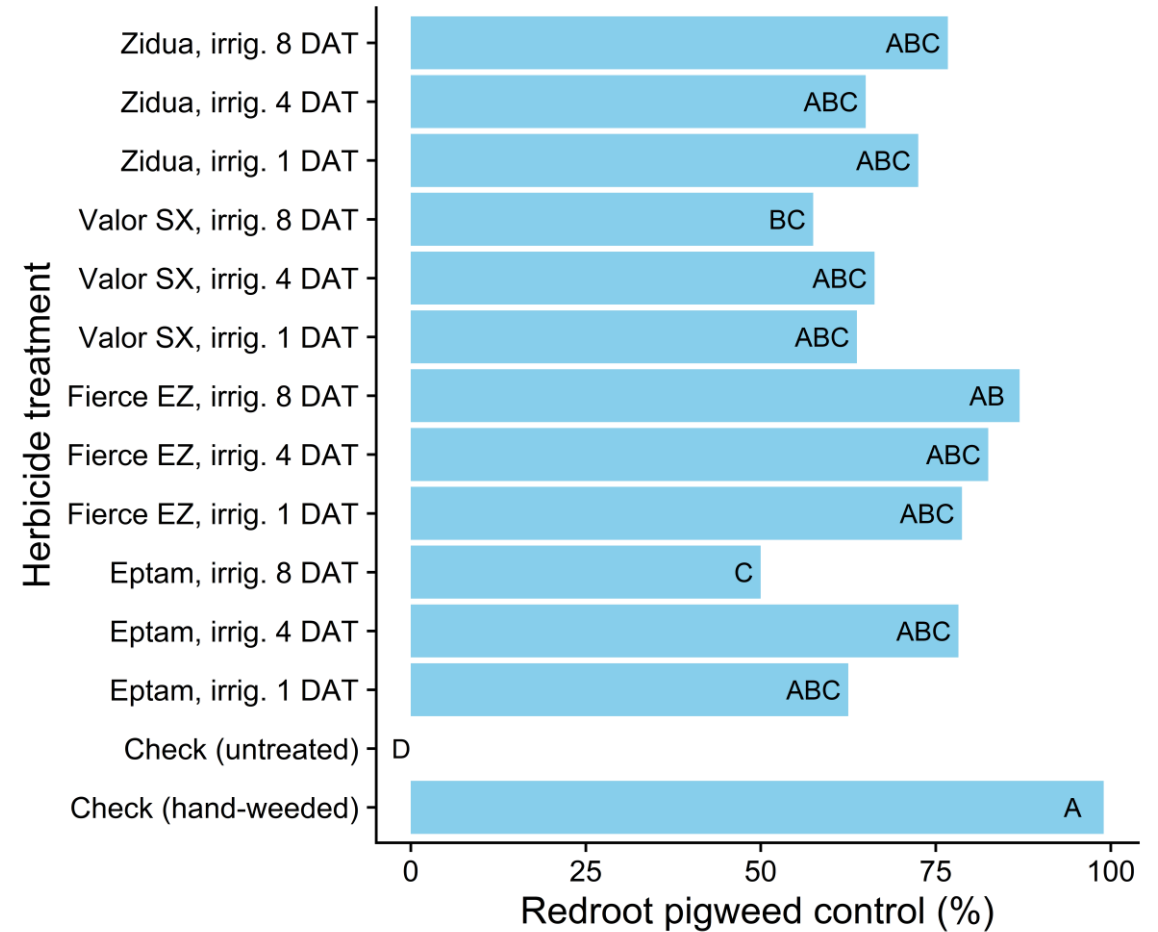


Redroot pigweed control

June 23, 2021



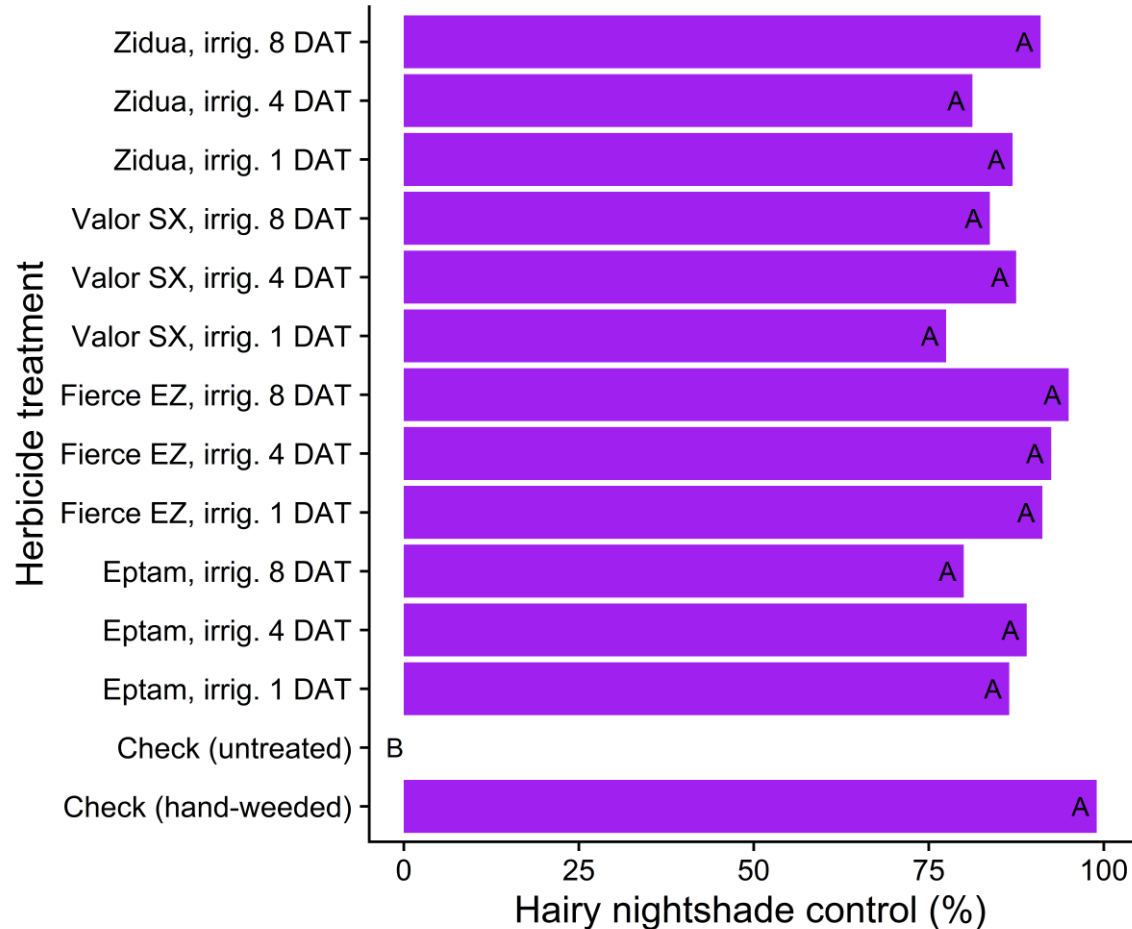
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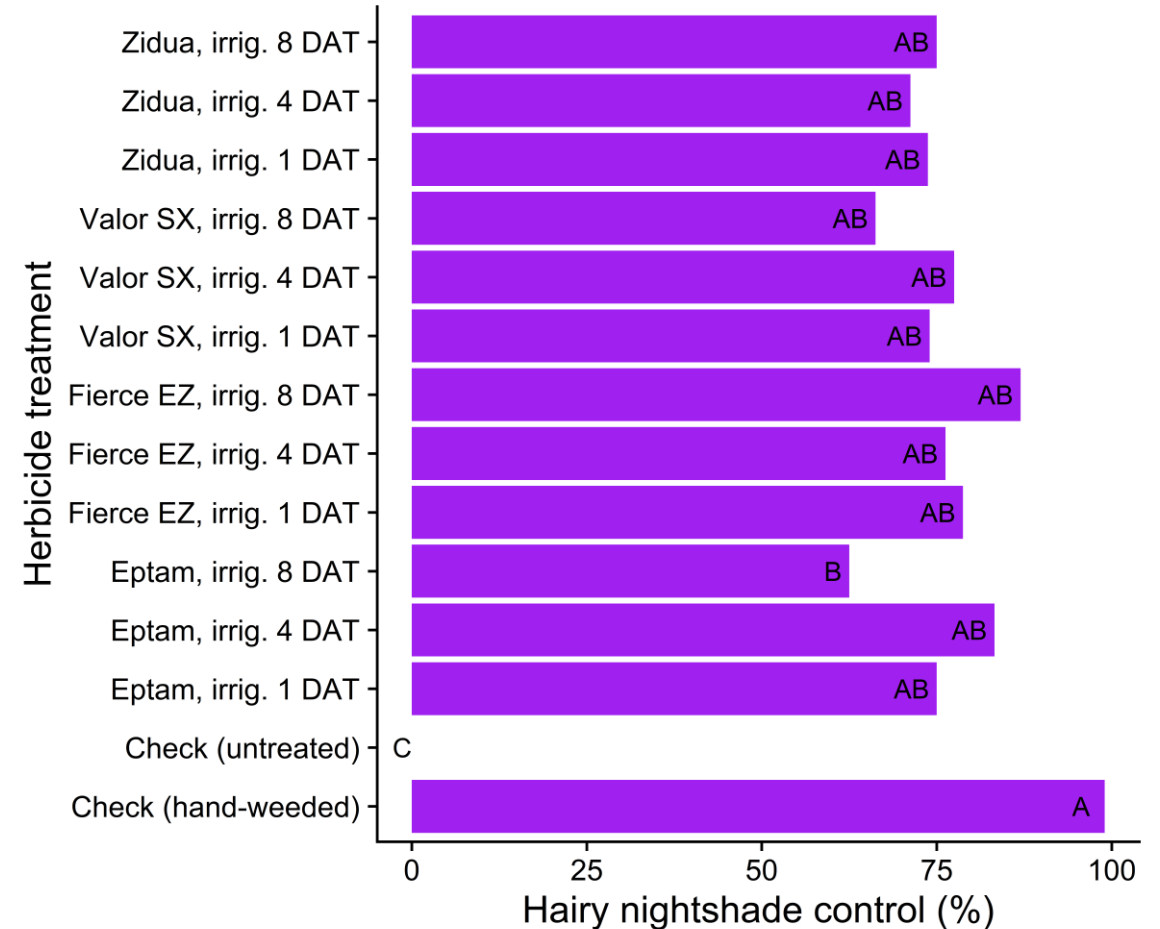


Hairy nightshade control

June 23, 2021



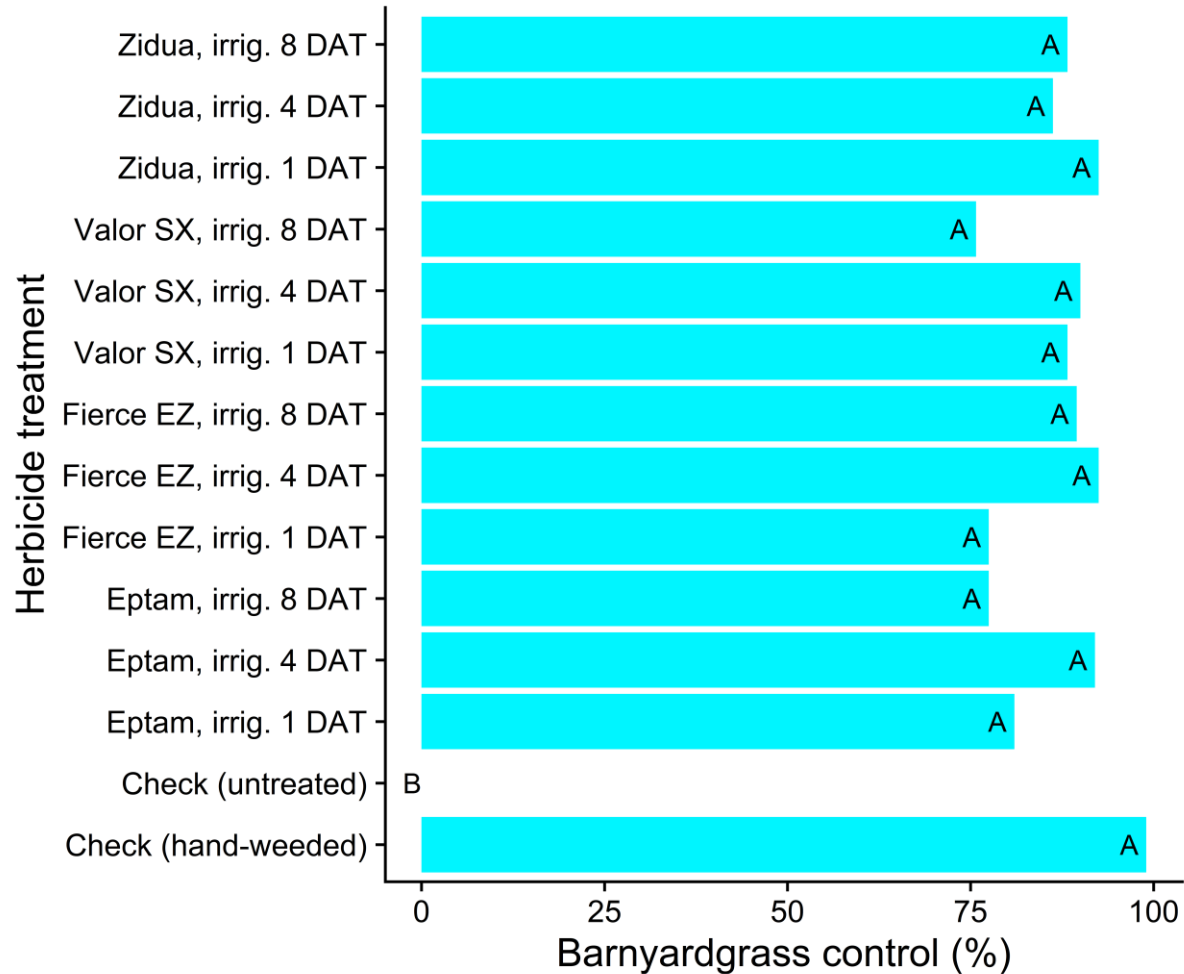
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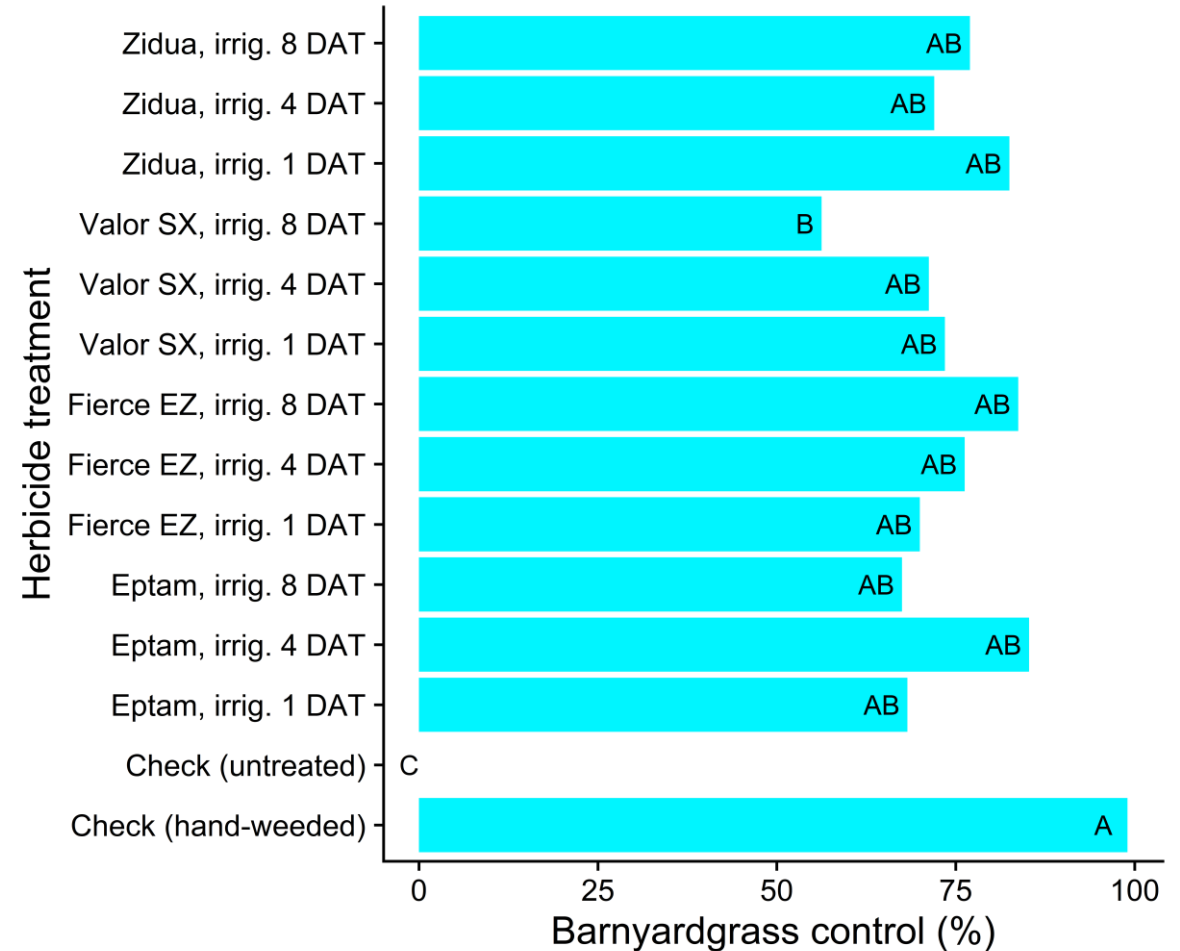


Barnyardgrass control

June 23, 2021



July 6, 2021





Untreated



Hand-weed control



Zidua (2 oz/a), irrigation 1 DAT



Zidua (2 oz/a), irrigation 4 DAT



Zidua (2 oz/a), irrigation 8 DAT



Valor (1.5 oz/a), irrigation 1 DAT



Valor (1.5 oz/a), irrigation 4 DAT



Valor (1.5 oz/a), irrigation 8 DAT



Untreated



Hand-weed control



Fierce (6 oz/a), irrigation 1 DAT



Fierce (6 oz/a), irrigation 4 DAT



Fierce (6 oz/a), irrigation 8 DAT



Eptam (3.5 pt/a), irrigation 1 DAT



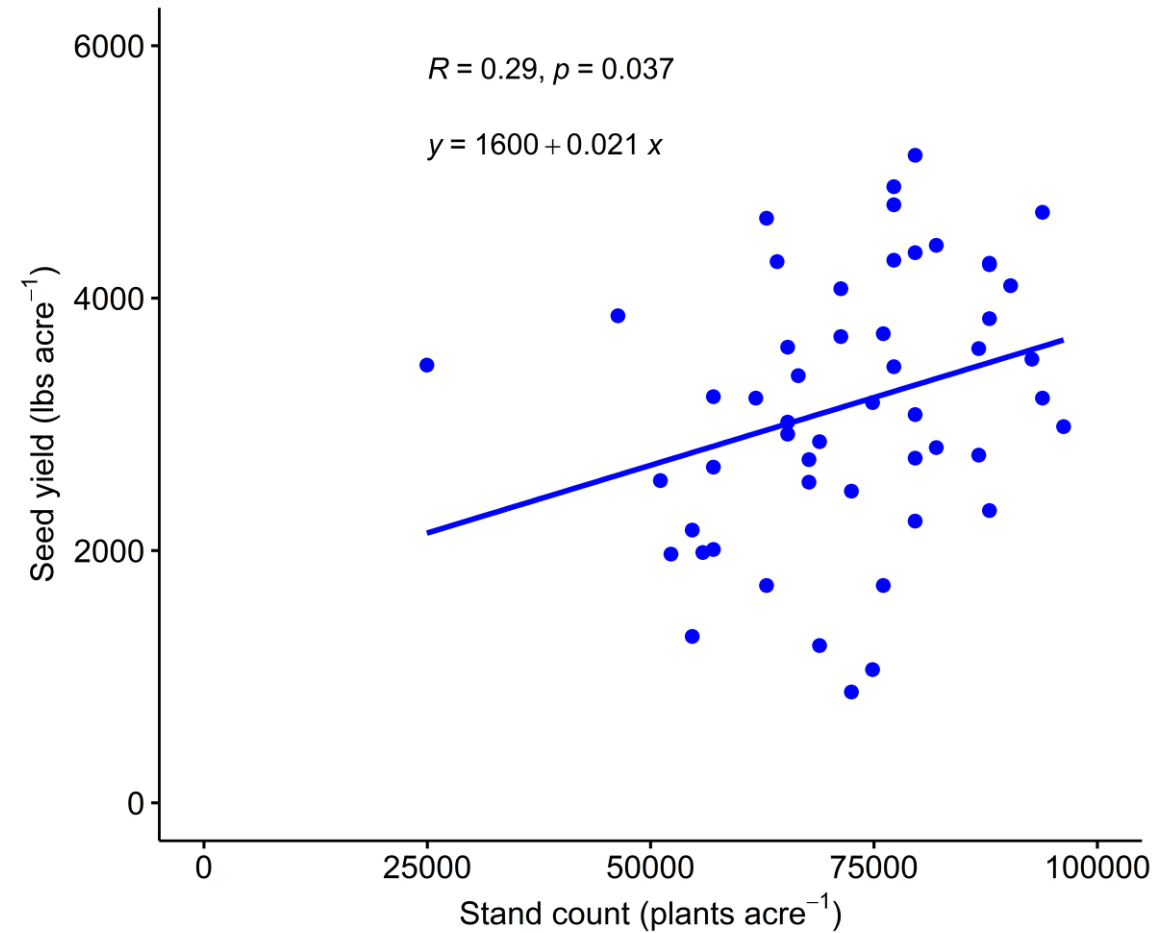
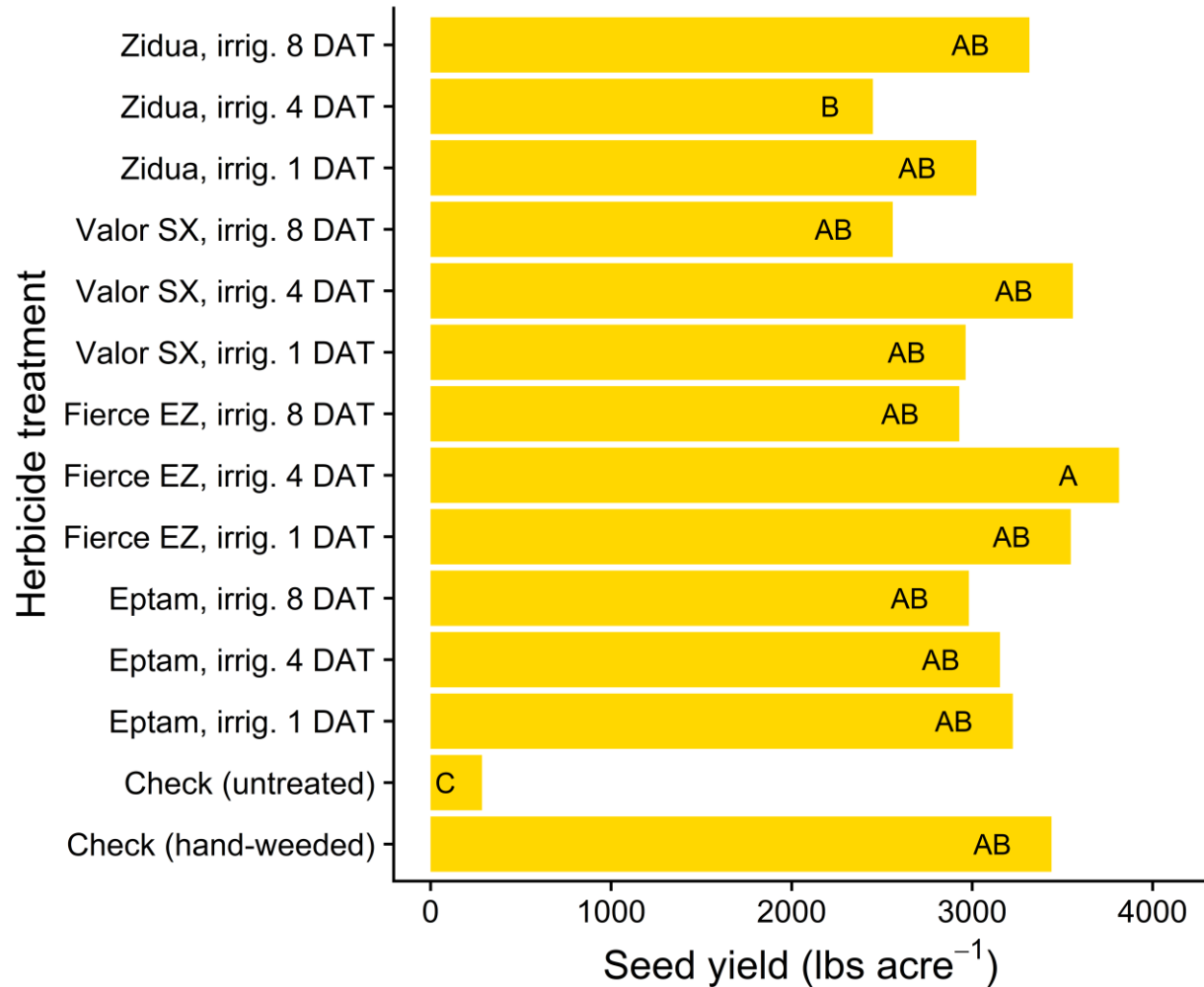
Eptam (3.5 pt/a), irrigation 4 DAT



Eptam (3.5 pt/a), irrigation 8 DAT



Seed yield



Conclusions

- Delaying herbicide Valor[®] activation slightly reduced dry bean stand density
 - Herbicide activation timing did not affect herbicide efficacy
 - Fierce[®], Valor[®], and Zidua[®] are promising herbicides for weed control in dry bean
 - These herbicides may need to be tankmixed with other herbicides for effective or season-long weed control in dry bean
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Acknowledgement

- Idaho Bean Commission
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