

Weed Management Trials in Specialty Crops

High -Value Crops Project, North Dakota State University

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Onion Weed Control Trials

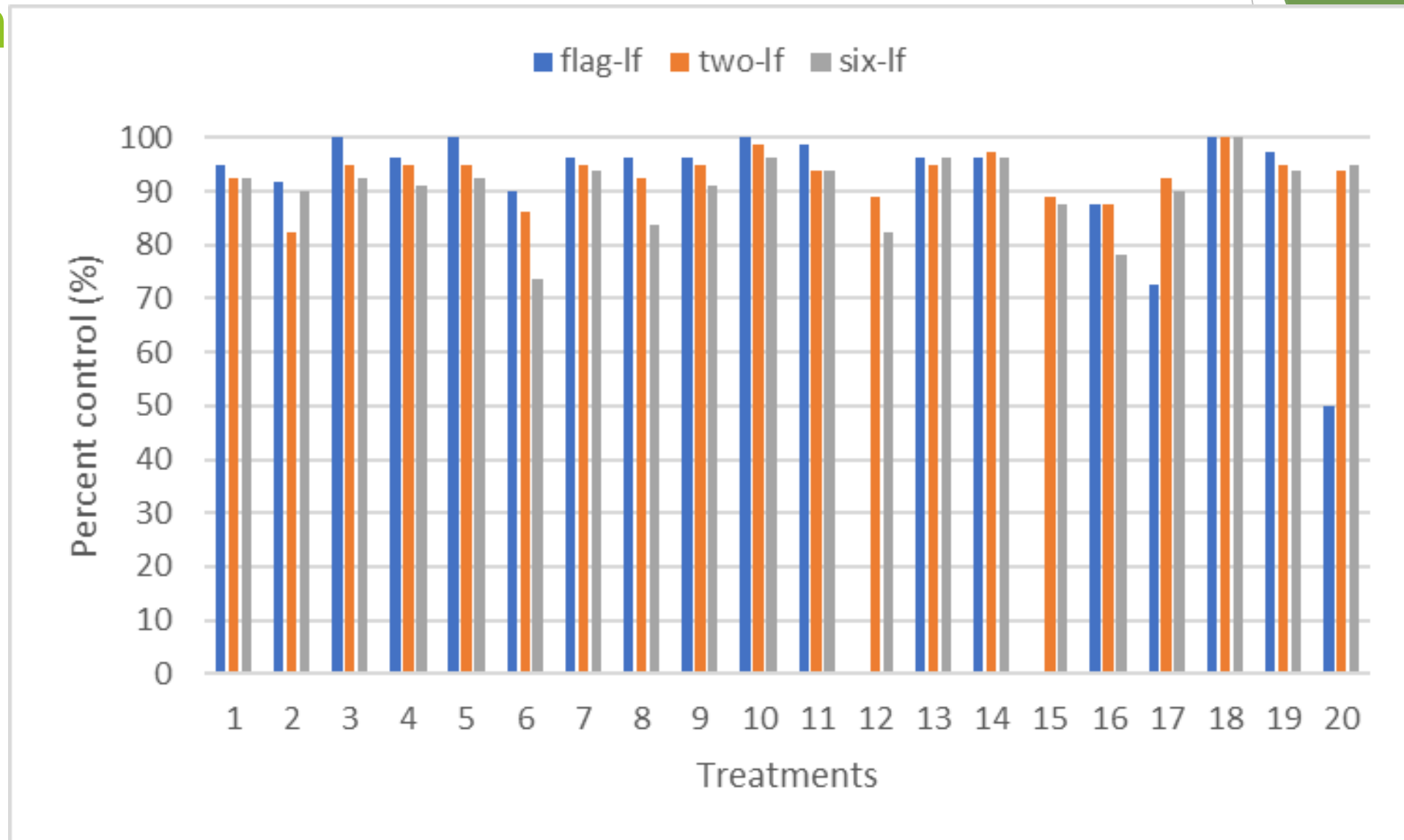
- ▶ Continue field trials to evaluate early-season weed control and crop safety.
- ▶ Objective:
 - ▶ Determine pendimethalin rate and application timing that consistently does not injure onion while providing early-season weed control.

Treatments

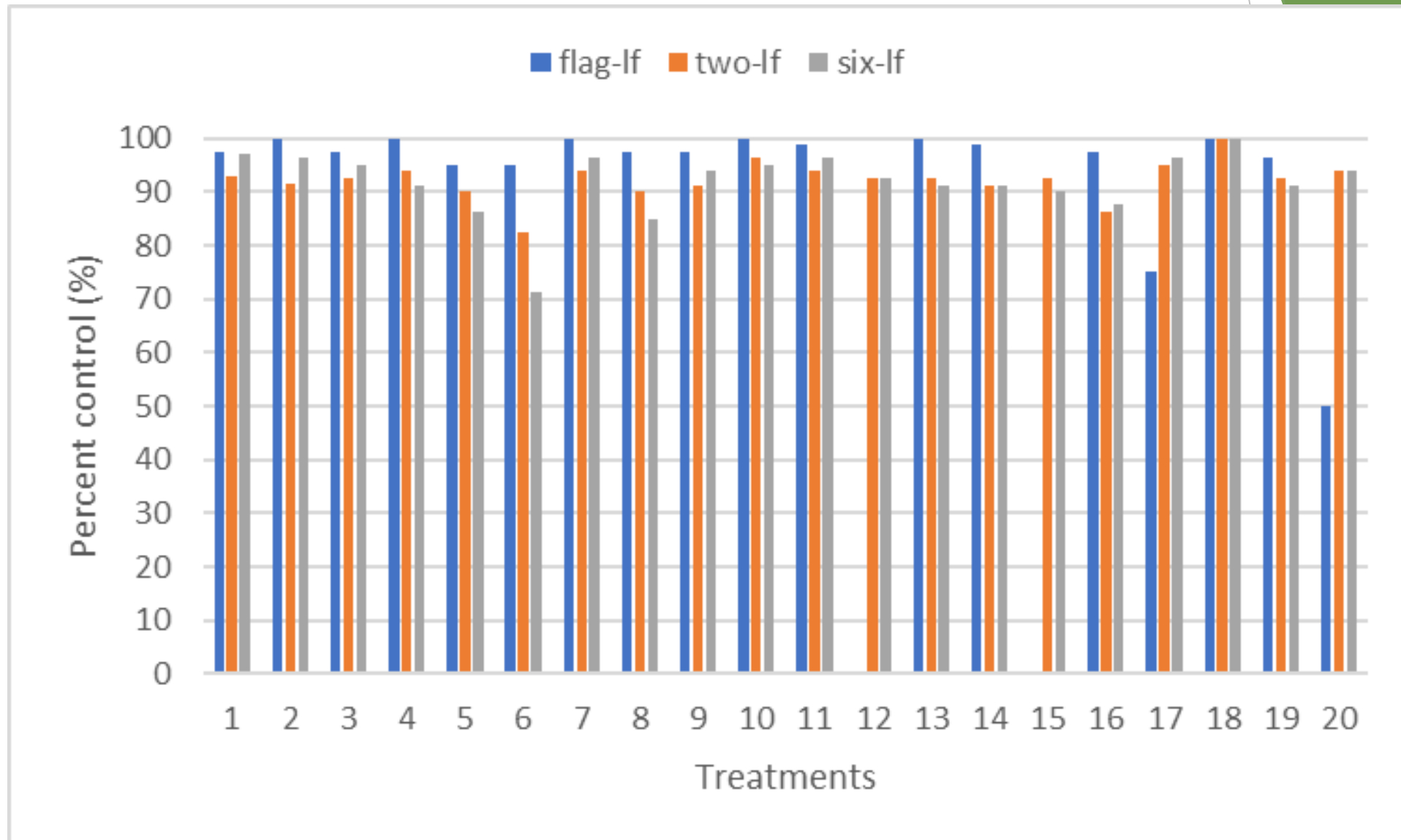
- ▶ PRE: 5/23
 - ▶ D PRE: 5/28
 - ▶ Flag: 6/8
 - ▶ 2 leaf: 6/22
 - ▶ 8 leaf: 7/21
- Chateau

TRT	PRE		Delayed PRE		Flag Leaf		2 Leaf	
1	Dacthal	10 pt/a					Goal Tender	4 floz/a
2	Norton	1.4 pt/a						
	Prowl H2O	0.75 pt/a					Goal Tender	4 floz/a
3	Norton	1.36 pt/a	Prowl H2O	0.75 pt/a			Goal Tender	4 floz/a
4	Prowl H2O	0.75 pt/a	Norton	1.4 pt/a			Goal Tender	4 floz/a
5	Prowl H2O	1.5 pt/a					Goal Tender	4 floz/a
6	Prowl H2O	0.75 pt/a					Goal Tender	4 floz/a
7			Prowl H2O	1.5 pt/a			Goal Tender	4 floz/a
8			Prowl H2O	0.75 pt/a			Goal Tender	4 floz/a
9			Nortron	1.36 pt/a				
			Prowl H2O	0.75 pt/a			Goal Tender	4 floz/a
10			Prowl H2O	1.5 pt/a				
			Buctril	1.0 pt/a			Goal Tender	4 floz/a
11			Prowl H2O	1.5 pt/a				
			RoundUp	22 oz/a			Goal Tender	4 floz/a
12					Prowl H2O	1.5 pt/a	Goal Tender	4 floz/a
13			Buctril	1 pt/a	Prowl H2O	1.5 pt/a	Goal Tender	4 floz/a
14			RoundUp	22 floz/a	Prowl H2O	1.5 pt/a	Goal Tender	4 floz/a
15					Prowl H2O	0.75 pt/a		
					Norton	1.36 pt/a	Goal Tender	4 floz/a
16			Norton	1.36 pt/a			Goal Tender	4 floz/a
17			Norton	2.72 pt/a			Goal Tender	4 floz/a
18	Weed-free							
19			Dacthal	10 pt/a			Goal Tender	4 floz/a
20					Norton	2.72 pt/a	Goal Tender	4 floz/a

Common Lambsquarters Control Over Time



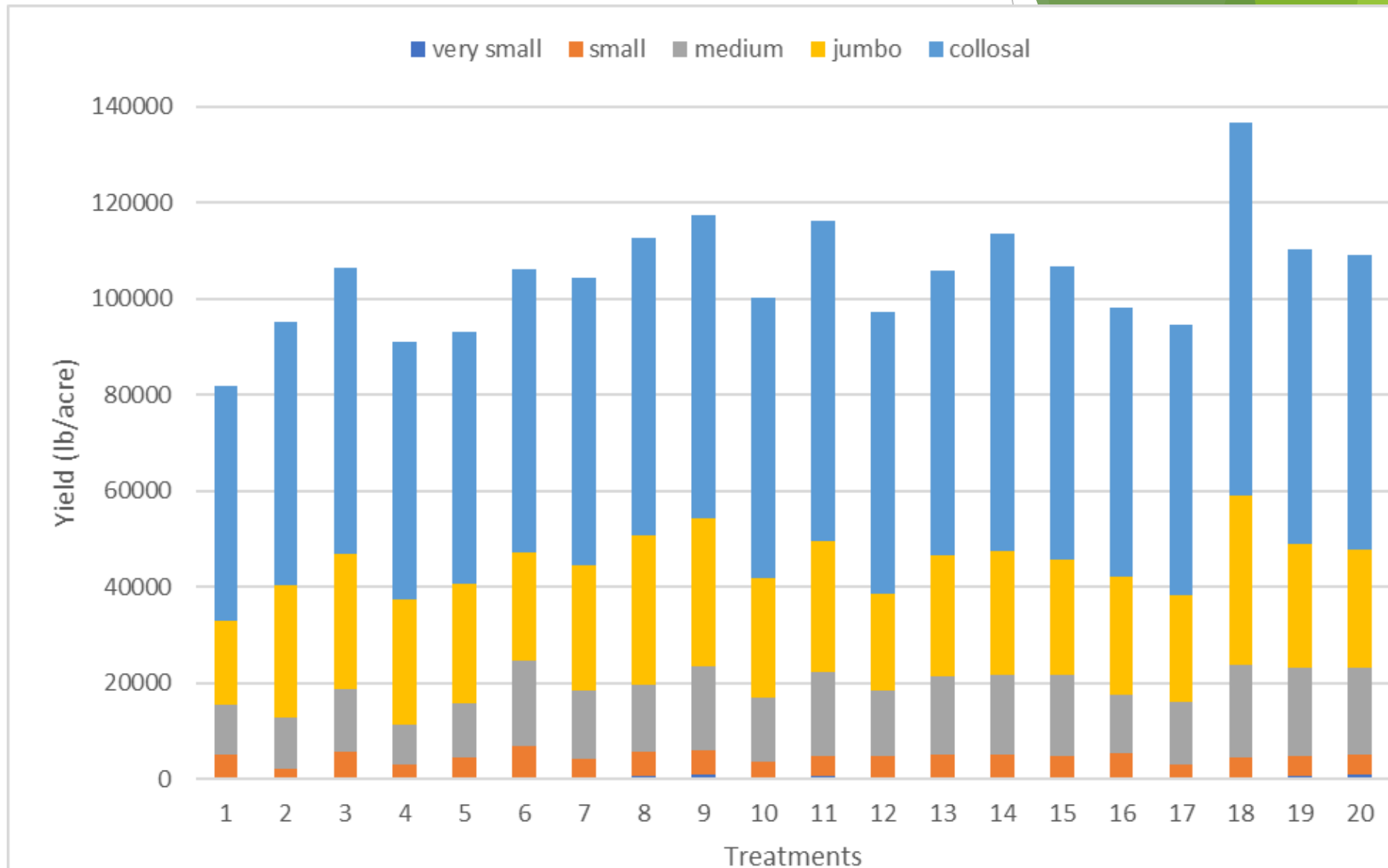
Redroot Pigweed Control Over Time



Yield

Trts 1-6 PRE, 7-11, 13, 14, 16, 17 Delayed PRE, 12, 15, 20 Flag Leaf

- Treatment 18 was the weed-free.
- Next highest total yields were:
 - Nortron+Prowl H2O 1.36+0.75 pt/a delayed PRE
 - Prowl H2O+RoundUp 1.5 pt/a+22 oz/a delayed PRE



Reducing Chateau Injury to Potato

- ▶ Flumioxazin has caused potato injury.
 - ▶ Several important potato growing states can't use flumioxazin in potatoes.
 - ▶ Label has strict application timings.
- ▶ Be sure a minimum of 2 inches of soil covers the vegetative portion of potato plants.
- ▶ Growers primarily rely on metribuzin for broadleaf weed control.
 - ▶ Does not control nightshade species.
 - ▶ Increasing numbers of triazine resistant weeds.

Treatments

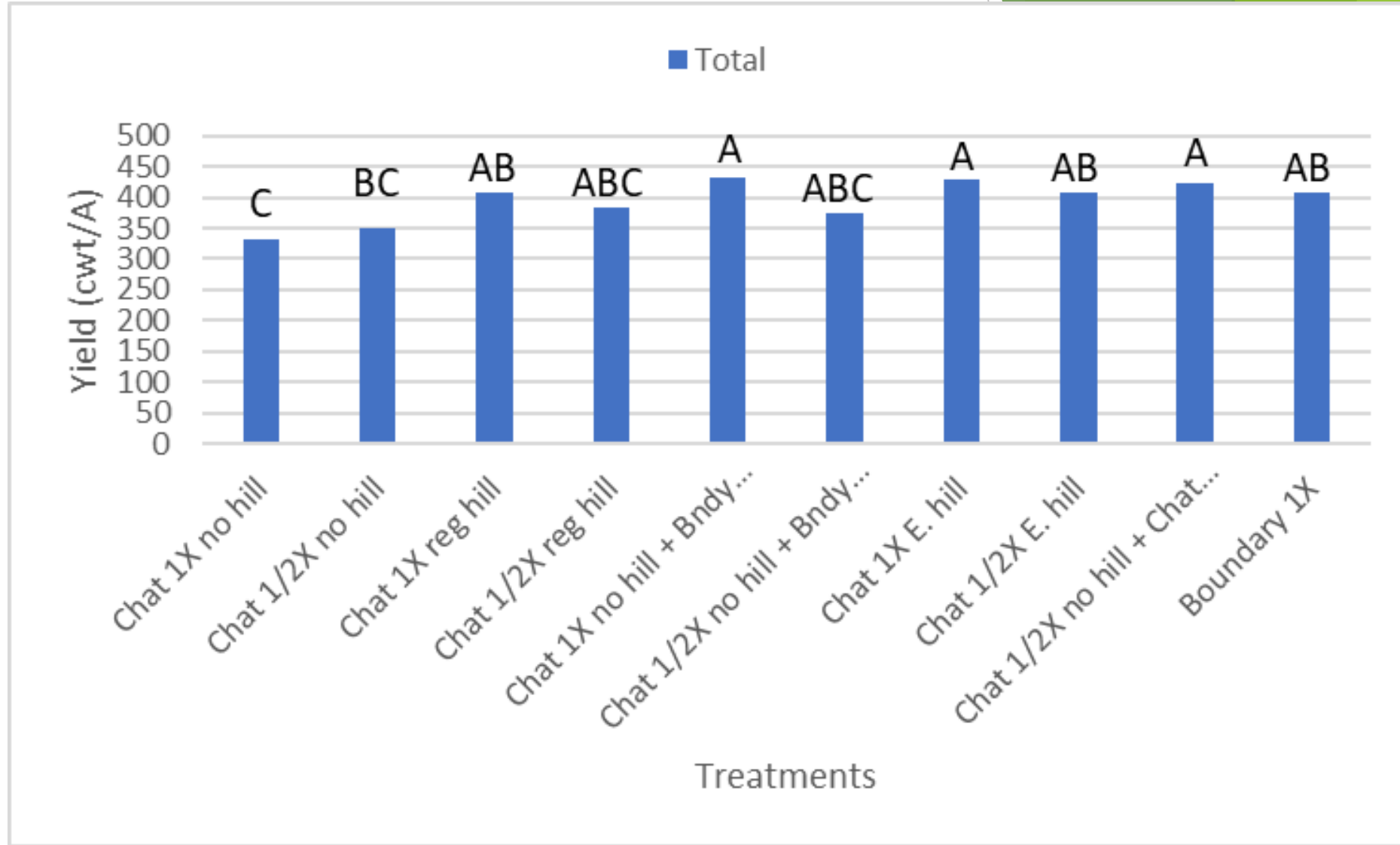
1	Chateau	1.5 oz	After Plant	2 DAP	Chat 1X no hill
2	Chateau	0.75 oz	After Plant	2 DAP	Chat 1/2X no hill
3	Chateau	1.5 oz	Normal Hill	9 DAP	Chat 1X reg hill
4	Chateau	0.75 oz	Normal Hill	9 DAP	Chat 1/2X reg hill
5	Chateau Boundary	1.5 oz 1 pt	After Plant Normal Hill	2 DAP 9 DAP	Chat 1X no hill + Bndy 1/2X reg hill
6	Chateau Boundary	0.75 oz 1 pt	After Plant Normal Hill	2 DAP 9 DAP	Chat 1/2X no hill + Bndy 1/2X reg hill
7	Chateau	1.5 oz	After E. Hill	2 DAP	Chat 1X E. hill
8	Chateau	0.75	After E. Hill	2 DAP	Chat 1/2X E. hill
9	Chateau Chateau	0.75 0.75	After E. Hill Normal Hill	2 DAP 9 DAP	Chat 1/2X E. hill + Chat 1/2X reg hill
10	Boundary	2 pt	Normal Hill	9 DAP	Boundary 1X

Results

- ▶ At 34 days after planting, none of the treatments caused >20% visible potato injury and all treatments provided >85% control of grass and broadleaf annual weeds.
- ▶ Plots treated with 0.5X or 1X flumioxazin and no hilling provided greater potato injury and less weed control when compared to other treatments.

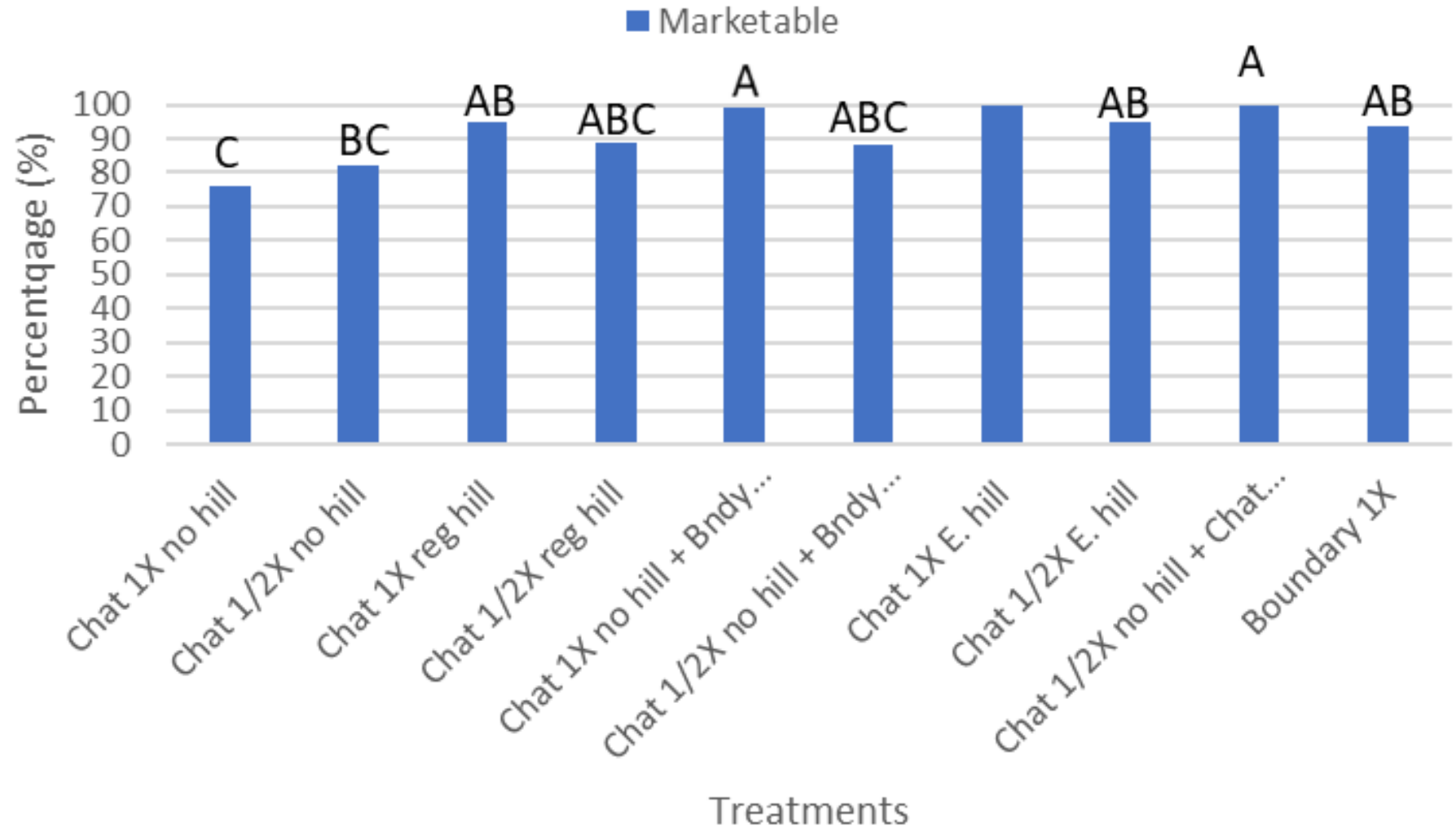
Results

Treatments 5, 7, 9
had greater total
yields than
treatments 1 and 2.



Results

Treatments 5, 7, 9
had greater percent
marketable than
treatments 1 and 2.



Multi-State Evaluation of Pumpkin/Squash Tolerance to Delayed PRE Applications of S-metolachlor.

- ▶ Thierry E Besancon, Rutgers University
- Sushila Chaudhari, Michigan State University
- Douglas Doohan, The Ohio State University
- Harlene M Hatterman-Valenti, North Dakota State University
- Katherine M Jennings, North Carolina State University
- Dwight Lingenfelter, Penn State University
- Stephen L Meyers, Purdue University
- Lynn M Sosnoskie, Cornell University
- Mark VanGessel, University of Delaware
- Kurt M Vollmer, University of Maryland

Treatments

1	Untreated			
2	S-metolachlor	Dual Magnum	1.33 pt/a	14 DAP
3	S-metolachlor	Dual Magnum	2.66 pt/a	14 DAP
4	S-metolachlor	Dual Magnum	1.33 pt/a	28 DAP
5	S-metolachlor	Dual Magnum	2.66 pt/a	28 DAP
6	S-metolachlor	Dual Magnum	2.66 pt/a	14 DAP
	Halosulfuron	Sandea	0.50 oz/a	
	NIS	NIS	0.25% v/v	
7	S-metolachlor	Dual Magnum	2.66 pt/a	28 DAP
	Halosulfuron	Sandea	0.50 oz/a	
	NIS	NIS	0.25% v/v	
8	Fomesafen	Reflex	8 floz/a	14 DAP
9	Fomesafen	Reflex	16 floz/a	14 DAP

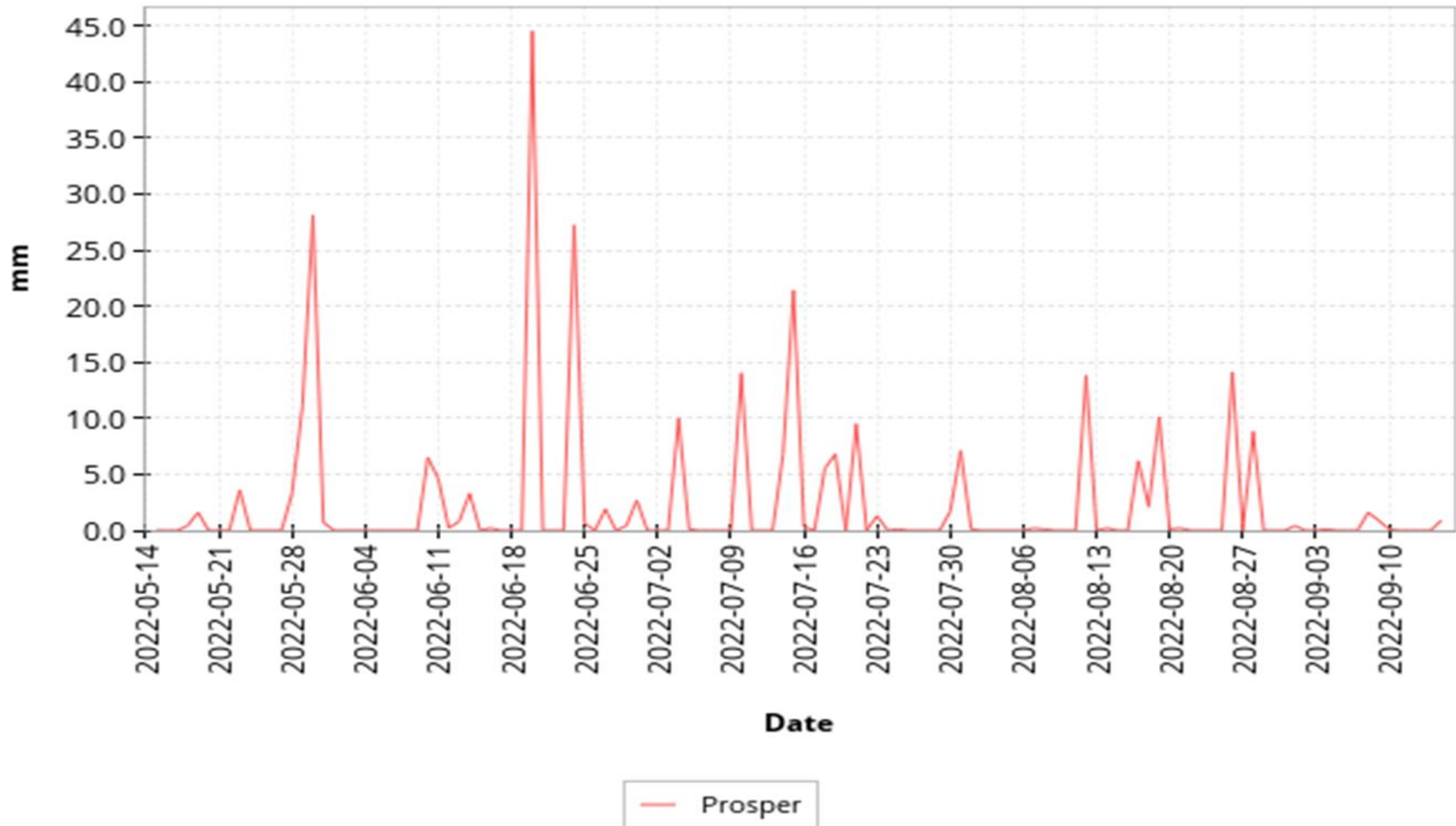
Is a critical weed free period needed for transplanted floral hemp?

- ▶ Multi-state project grant to evaluate weed management practices and to develop recommendations.
- ▶ Floral hemp: ND, NY, and SC.
- ▶ Grain/fiber hemp: IL and VA
- ▶ Objective: To define the critical weed-free period for transplanted floral hemp.
- ▶ Weed-free treatments: 0, 1, 2, 4, 6, and weed-free (16 wks).
- ▶ Annual weed and perennial weed trials:

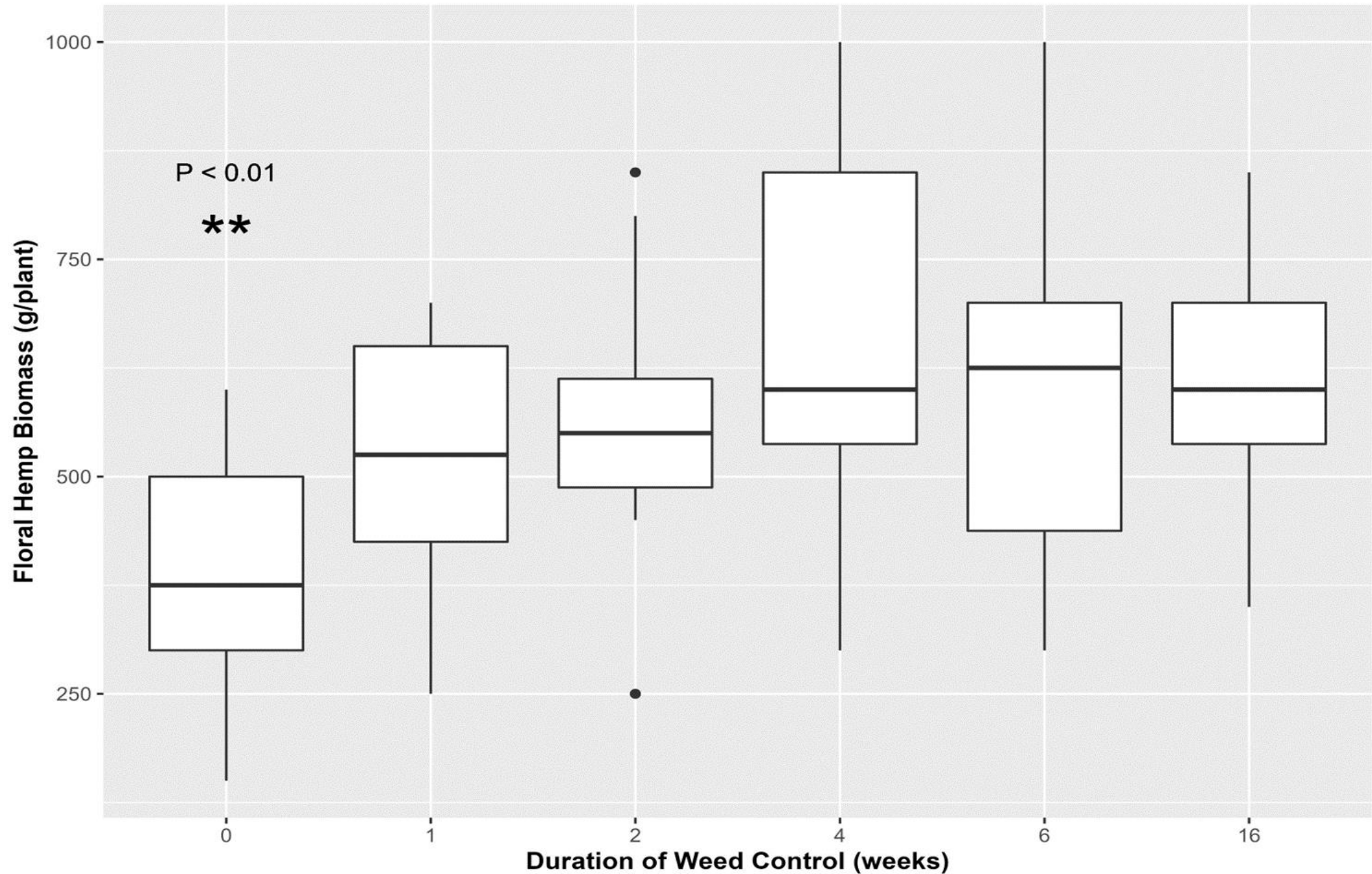
Total Rainfall

(2022-05-15 - 2022-09-15)

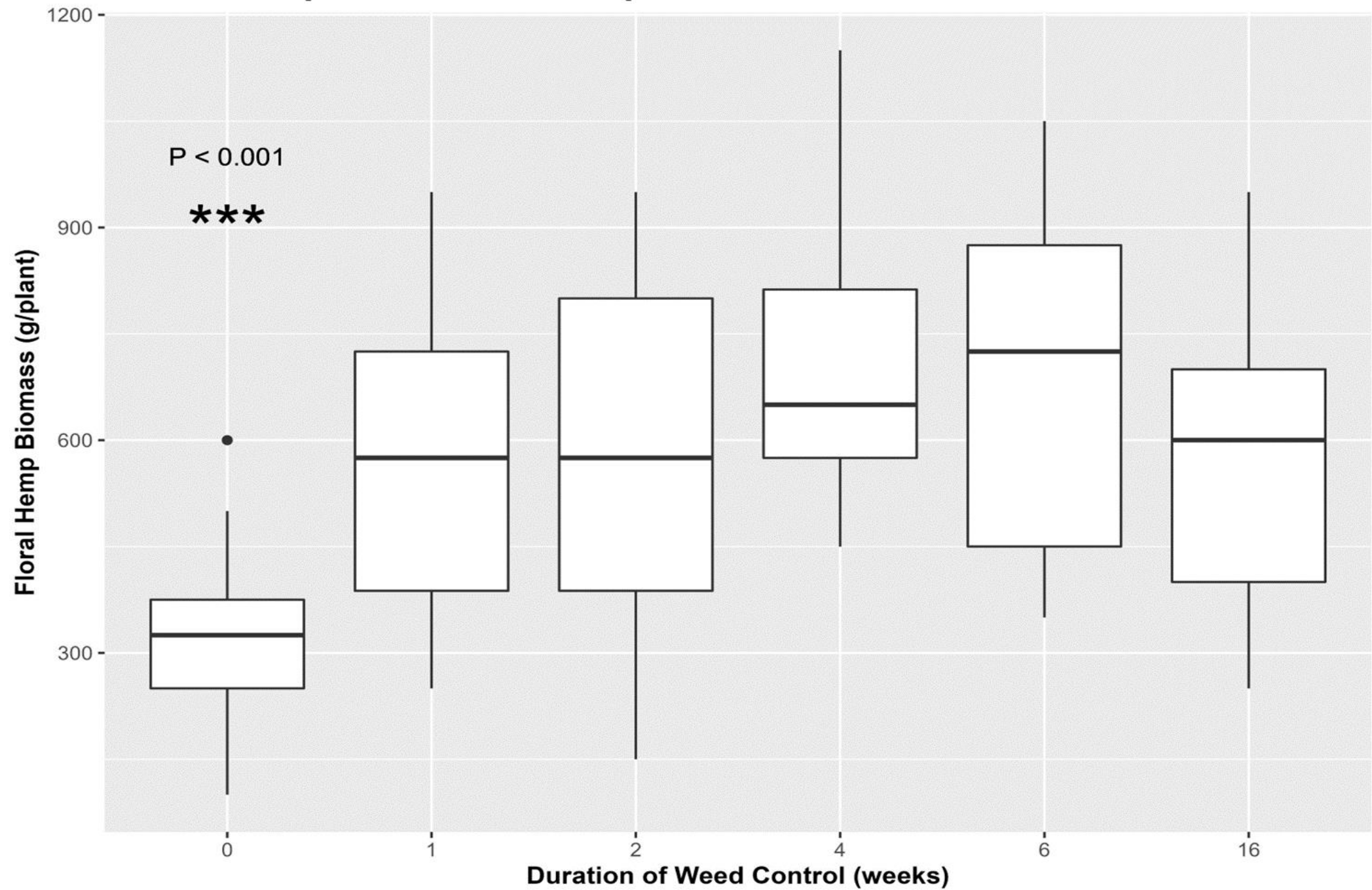
North Dakota Agricultural Weather Network (NDAWN)



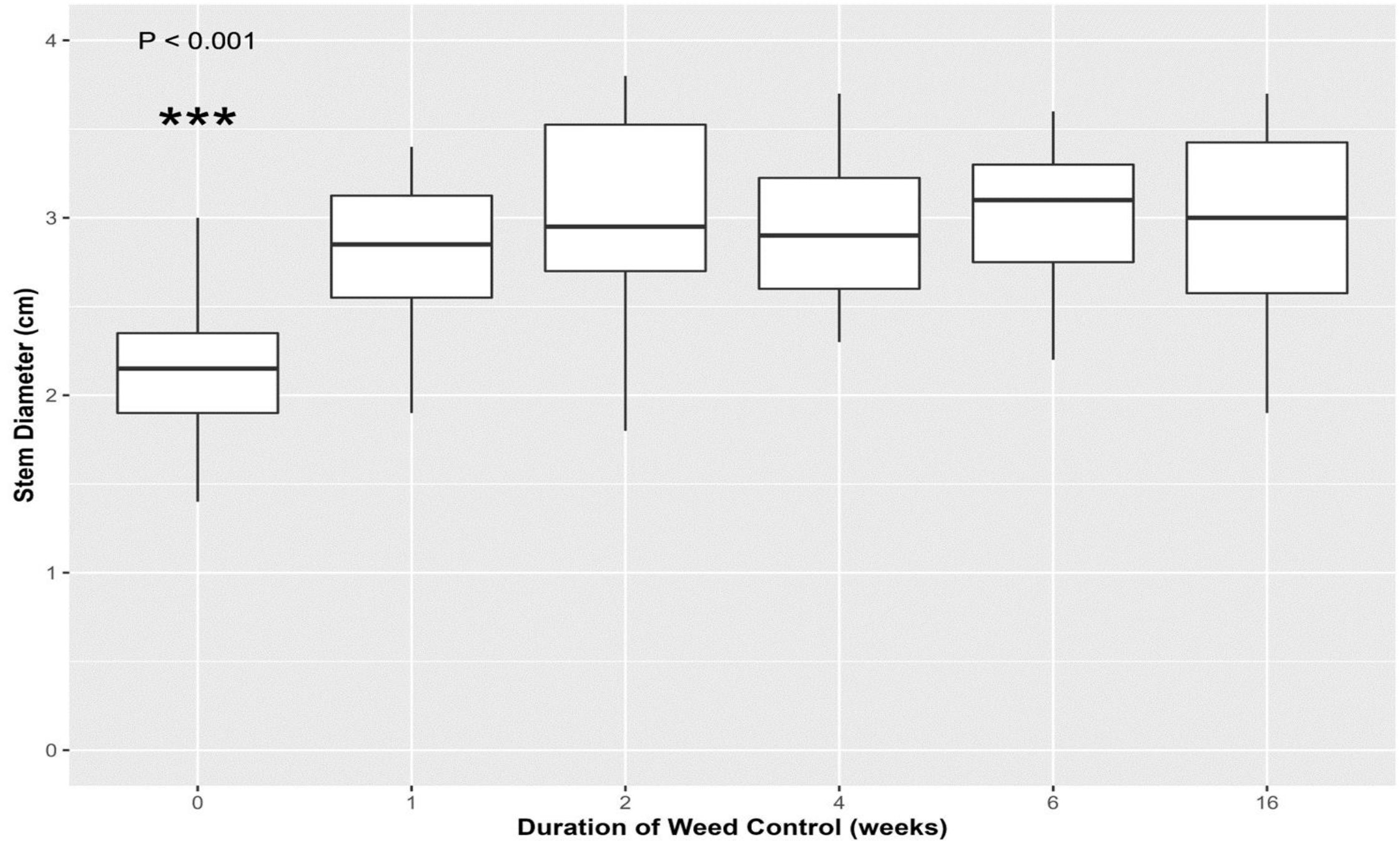
Floral Hemp Biomass in Response to Annual-Weed Control Duration



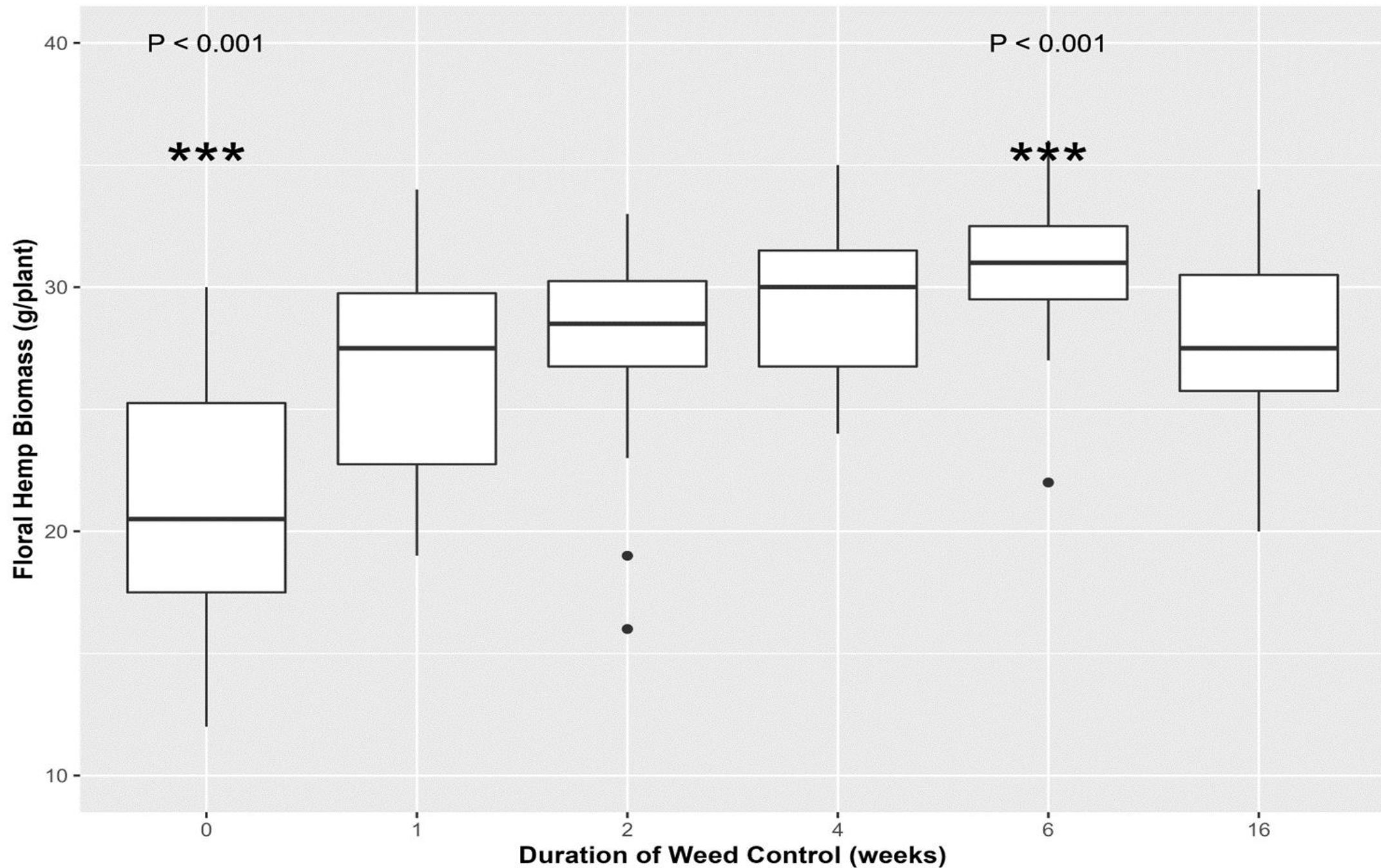
Floral Hemp Biomass in Response to Perennial-Weed Control



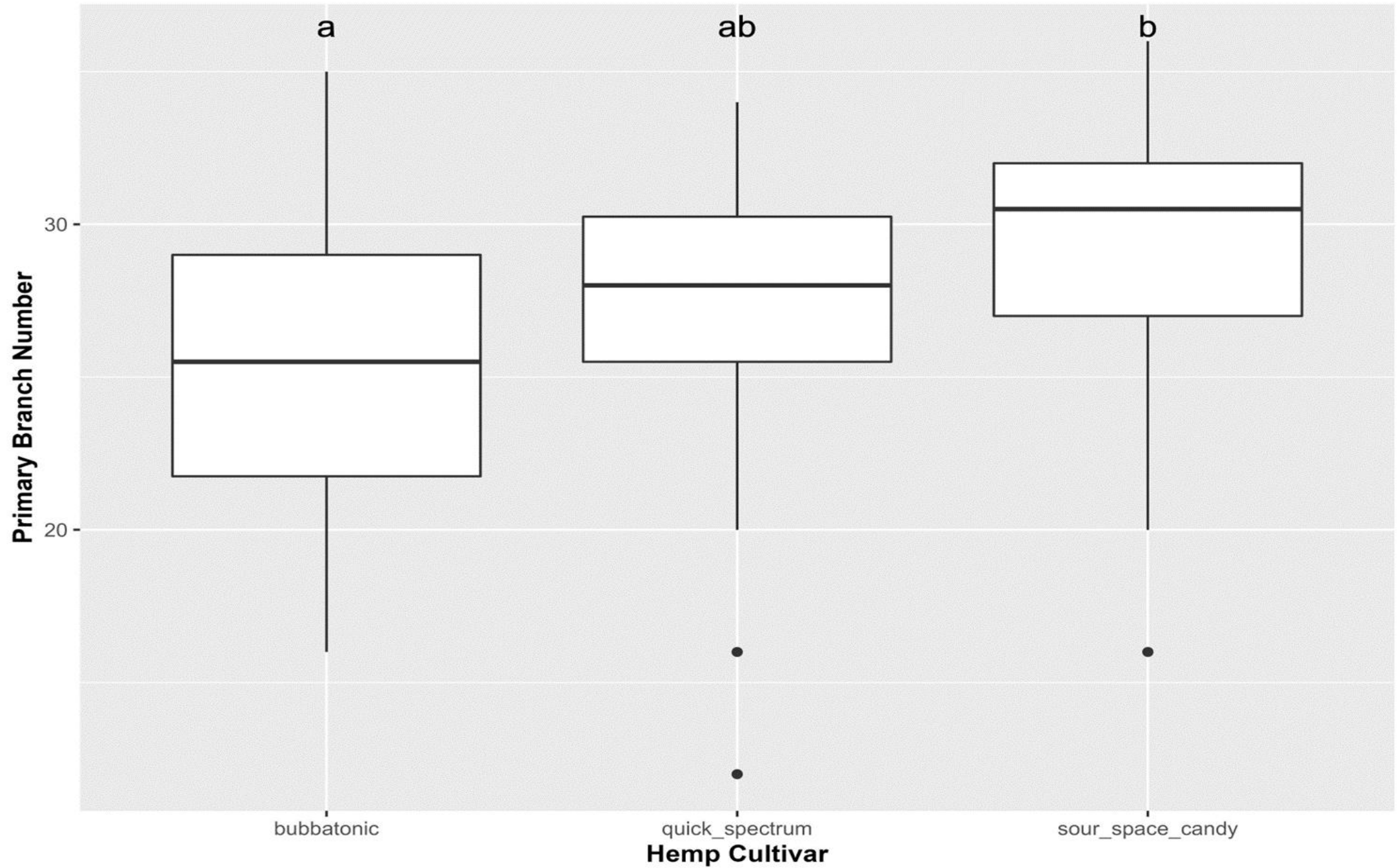
Stem Diameter in Response to Duration of Perrenial-Weed Control



Branch Number in Response to Perennial-Weed Control Duration



Primary Branch Number in Response to Hemp Cultivar



Conclusions

Annual Weeds

- ▶ Removing weeds for at least one week resulted in larger plants as well as more cola and leaf biomass compared to plants without any weed removal.
 - ▶ These results were attributed to the predominantly spring germinating weed species present at this location.

Perennial Weeds

- ▶ Removing weeds for at least one week resulted in larger plants with greater stem diameter and more branches, as well as more cola and leaf biomass compared to plants without any weed removal.
 - ▶ These results were attributed to the length of time it took for perennial plants to become reestablished at this location.
- ▶ ‘Sour Space Candy’ produced more branches than ‘Bubbatonic’.
 - ▶ These results were attributed to genetic differences.

Questions?