



How to remove Roundup Ready alfalfa



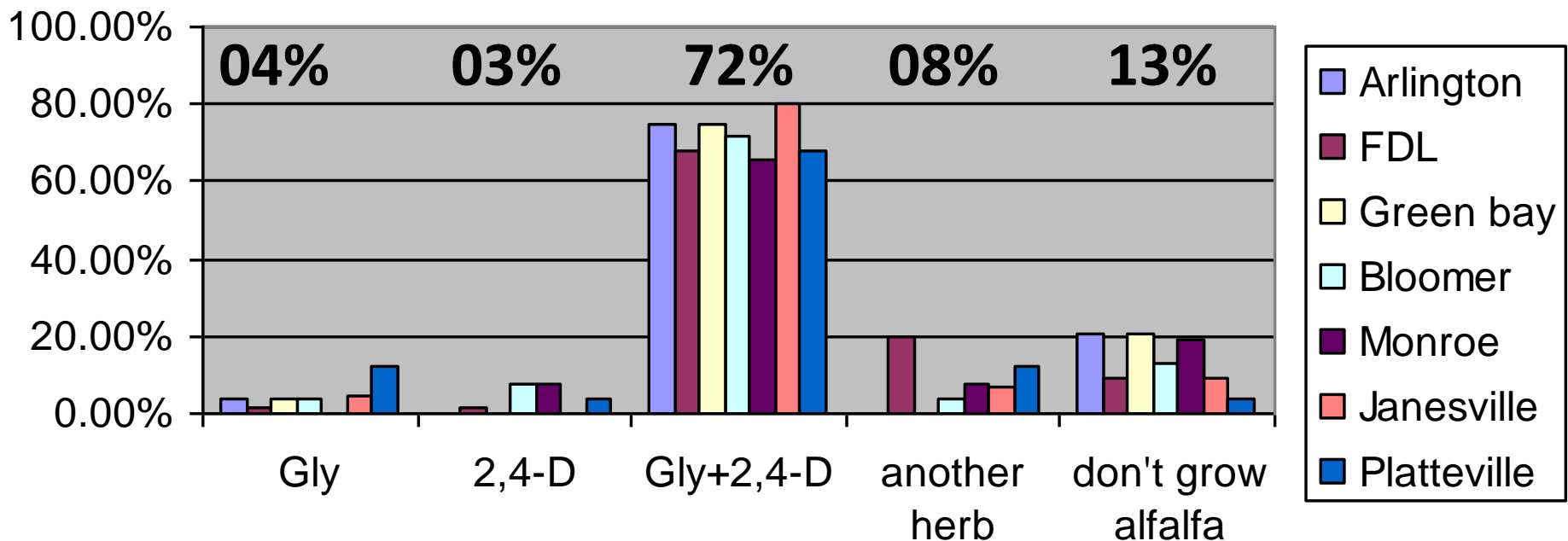
Why remove alfalfa?

- Is a weed in other crops
- Can cause substantial yield loss
 - Yield losses in corn >30 bu/A with in crop appl.
- Surveyed crop consultants in 2007 and they responded that they wanted high levels of control prior to planting control
 - 83% wanted control to be between 70 and 100%

What are people using to remove alfalfa in Wisconsin?

Results from 2007 survey at PMU n=253

In no-till systems what do you use to remove alfalfa?



How do I remove Roundup Ready alfalfa?

- Will have to change management to prevent losses in future crops
 1. Removal strategies
 2. Management of volunteer species

Alfalfa removal strategies

- Before planting
 - Tillage
 - Herbicides
 - Fall
 - Spring
- After future crop is in the ground
 - Scouting
 - Cultivation
 - Herbicides

Effectiveness of Tillage

- Herbicides in combination with tillage are clearly the most effective option in terminating alfalfa
 - Research has shown even poor suppression from herbicides can improve >80% when include tillage
- Tillage alone can be effective
 - Studies across US range from 0-100% control
 - WI fall chisel plow 81% and 98% control (May)
 - Depends on how aggressive tillage is conducted
 - **Often plants will survive tillage and resprout**

What herbicides are available to remove Roundup Ready alfalfa?

- Depends on what crop you are rotating to
- Corn will be the focus of this presentation



Many studies have been conducted to evaluate Roundup Ready Alfalfa removal

Year	# studies	Study locations	Rotational crop planted
2001	5	IA, OH, WA	4 corn 1 spring wheat
2002	11	AZ, IN, NY, PA, WI, CA	7 corn 4 none
2003	4	IA, MO, WA	3 corn 1 none
2006	2	MT, WI	2 none
2007	1	WI	corn
2011	1	MI	corn
	24 trials	10 states	

Summary of results from study

- 2,4-D + dicamba consistently provided >90% control of alfalfa across studies.
 - Needed at least 1.0 lbs ai/A total (usually 2pts/A)
- Alfalfa was also effectively controlled with products that contained clopyralid (Stinger, Hornet)
- Addition of tillage improved control
- In corn, alfalfa control was improved by in season applications of systemic herbicides
 - Dicamba: Distinct, Marksman
 - Clopyralid: Stinger, Hornet

What to consider when removing Roundup Ready alfalfa

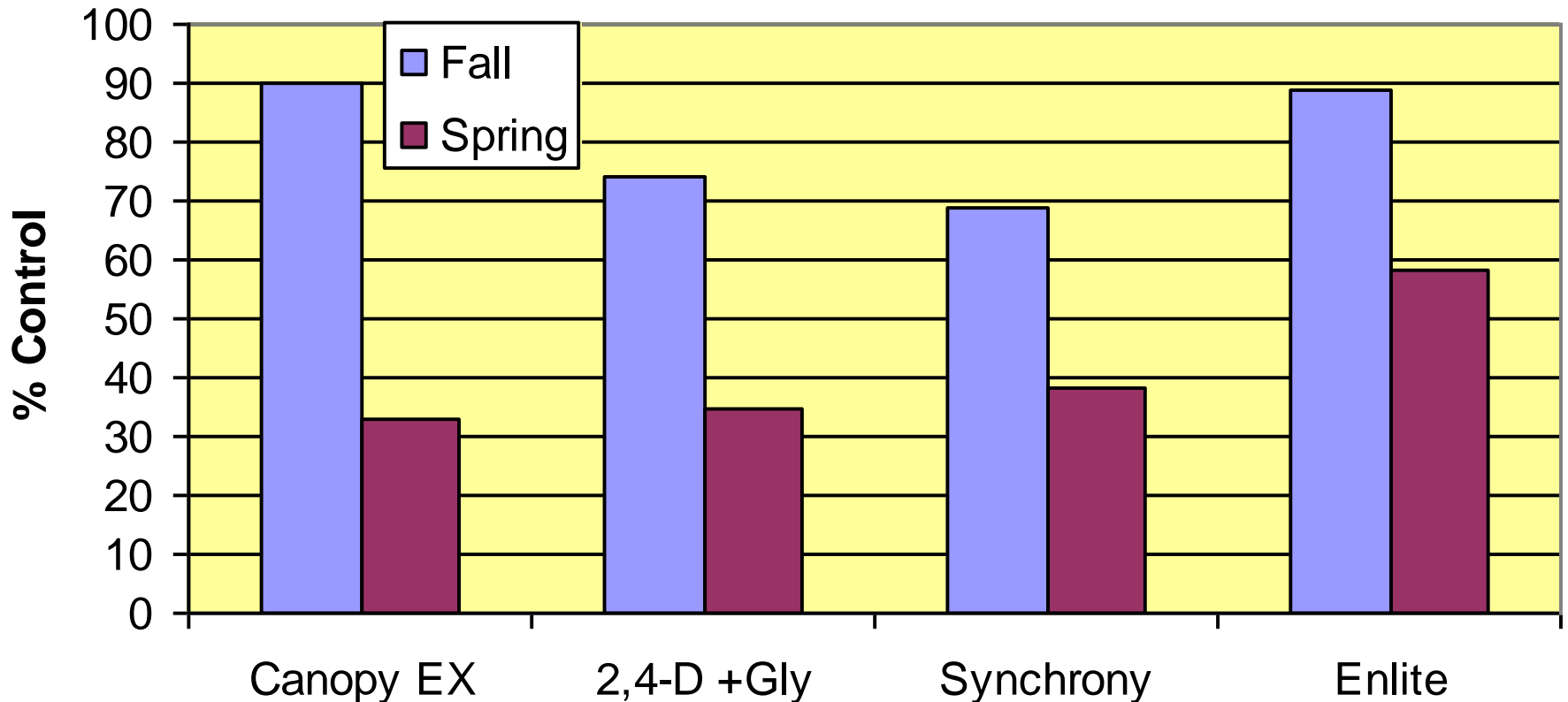
1. Time of year and temperature
 - Fall vs Spring
 - Temperature effects on performance of herbicides
2. Status of the plants
 1. Amount of regrowth when treating
 2. Stress to plants
3. Future crops planned & management
 1. Glyphosate resistant crops?
 2. Planning on adding a non-glyphosate MOA?

Time of year

Spring or fall, which is the best time?

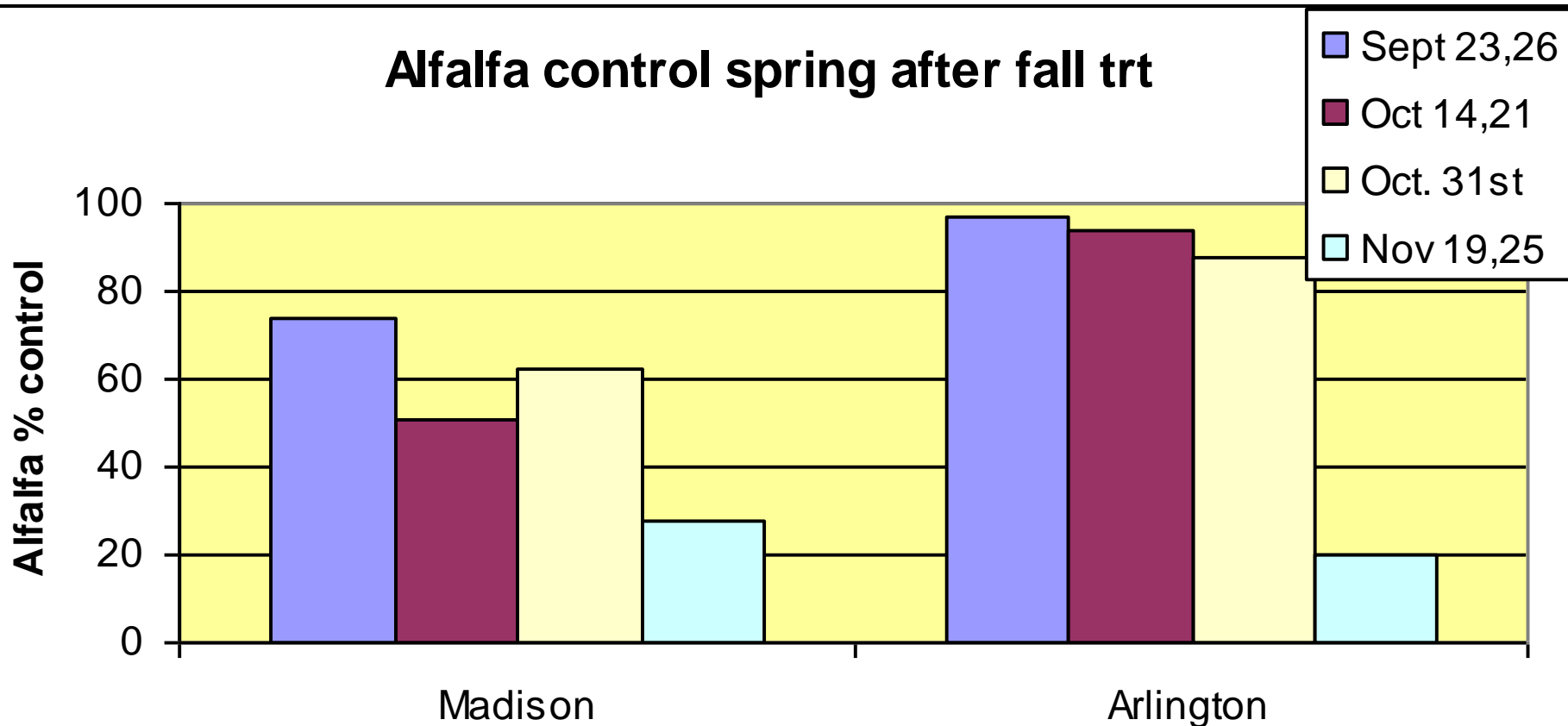
Fall applied 11/14
Spring applied 5/4

Dandelion control

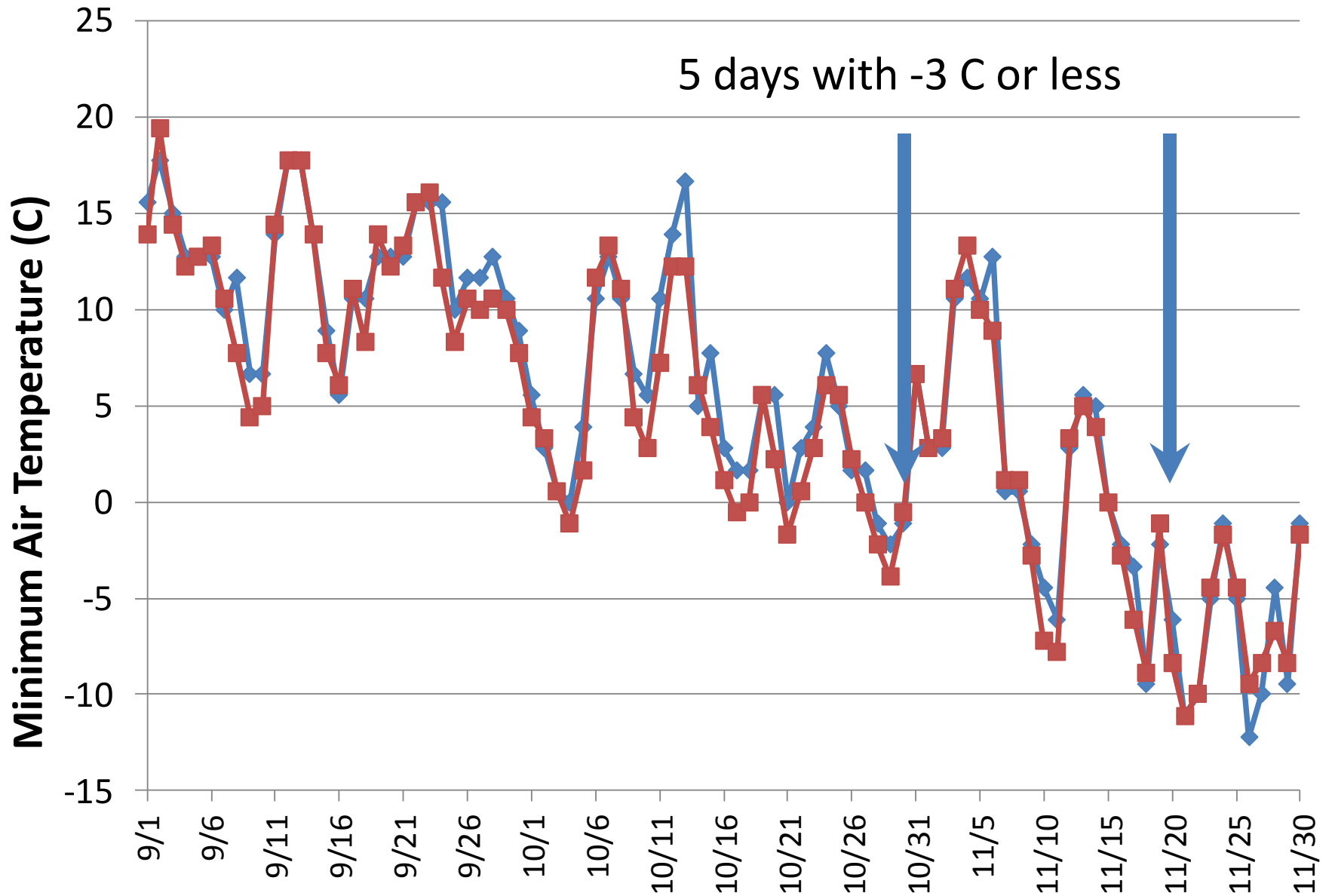


If fall, when should you treat?

- Alfalfa treated with 2,4-D (1 pint/A)
- Note control dramatically reduced at last timing



2008 Minimum Temperatures



What rates should you use in the fall?

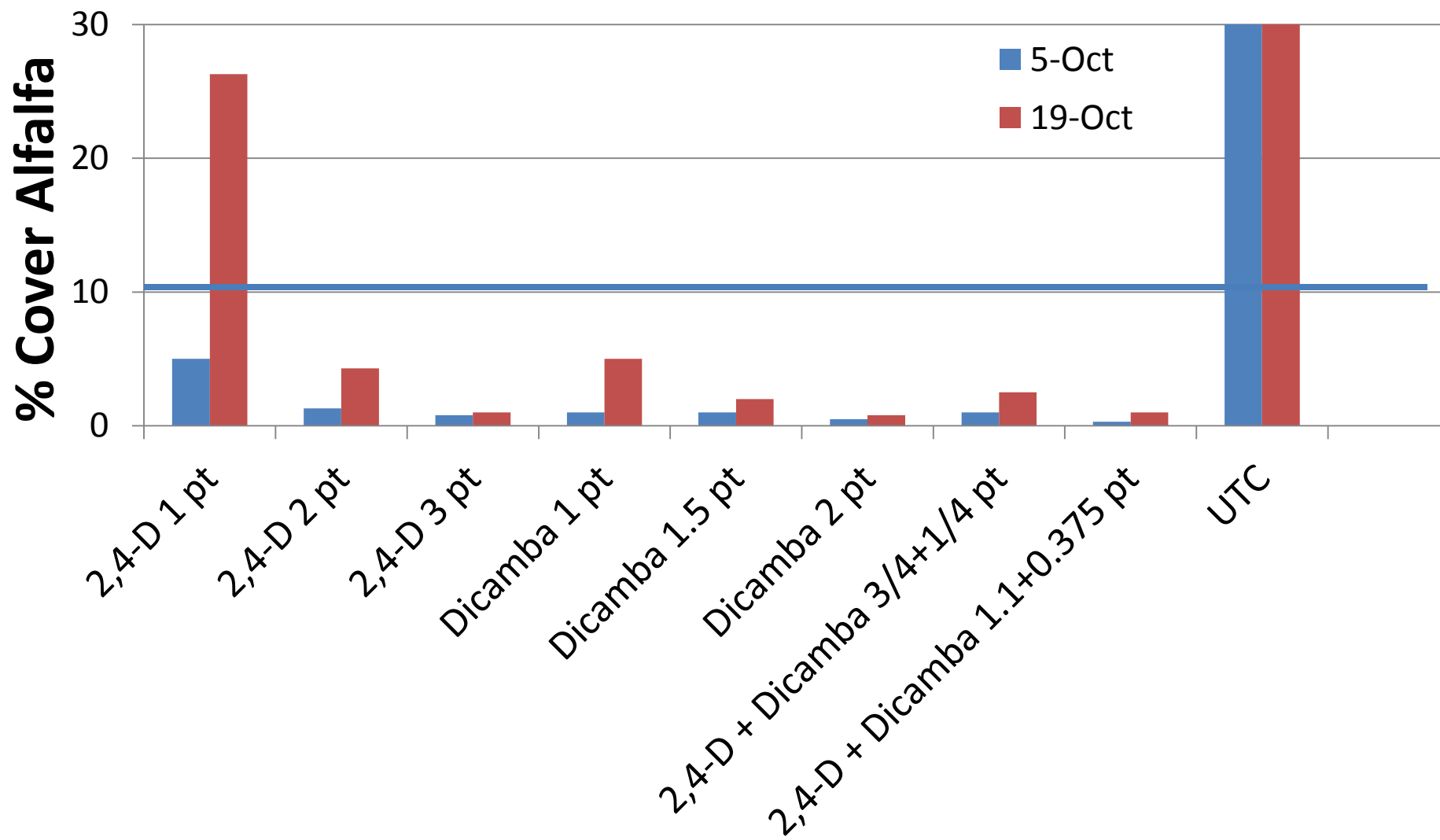
WI alfalfa removal studies

Arlington, WI

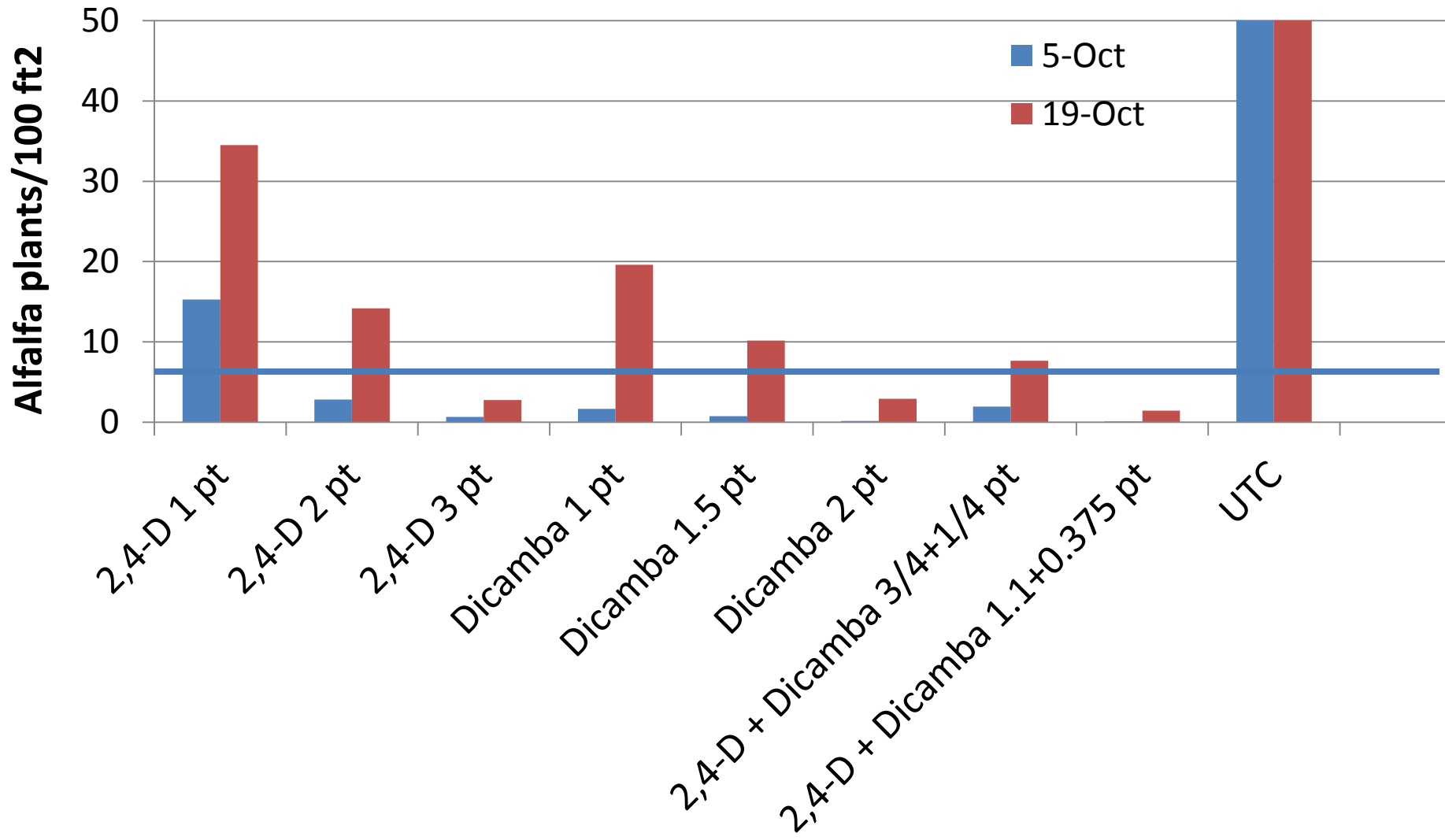
	10/5/06	10/19/2006
Height of alfalfa	4-6 in tall	5 – 7 in tall
Air/Soil Temp when applied	Air = 59 F; Soil =57 F	Air = 39 F; Soil =40 F
Max/Min air temp day of app.	Max= 57F; Min= 34F	Max= 39F; Min= 31F
Max/Min air temp day after app.	Max= 62F; Min= 29F	Max= 47F; Min= 25F

- Two applications
 - October 5th
 - October 19th

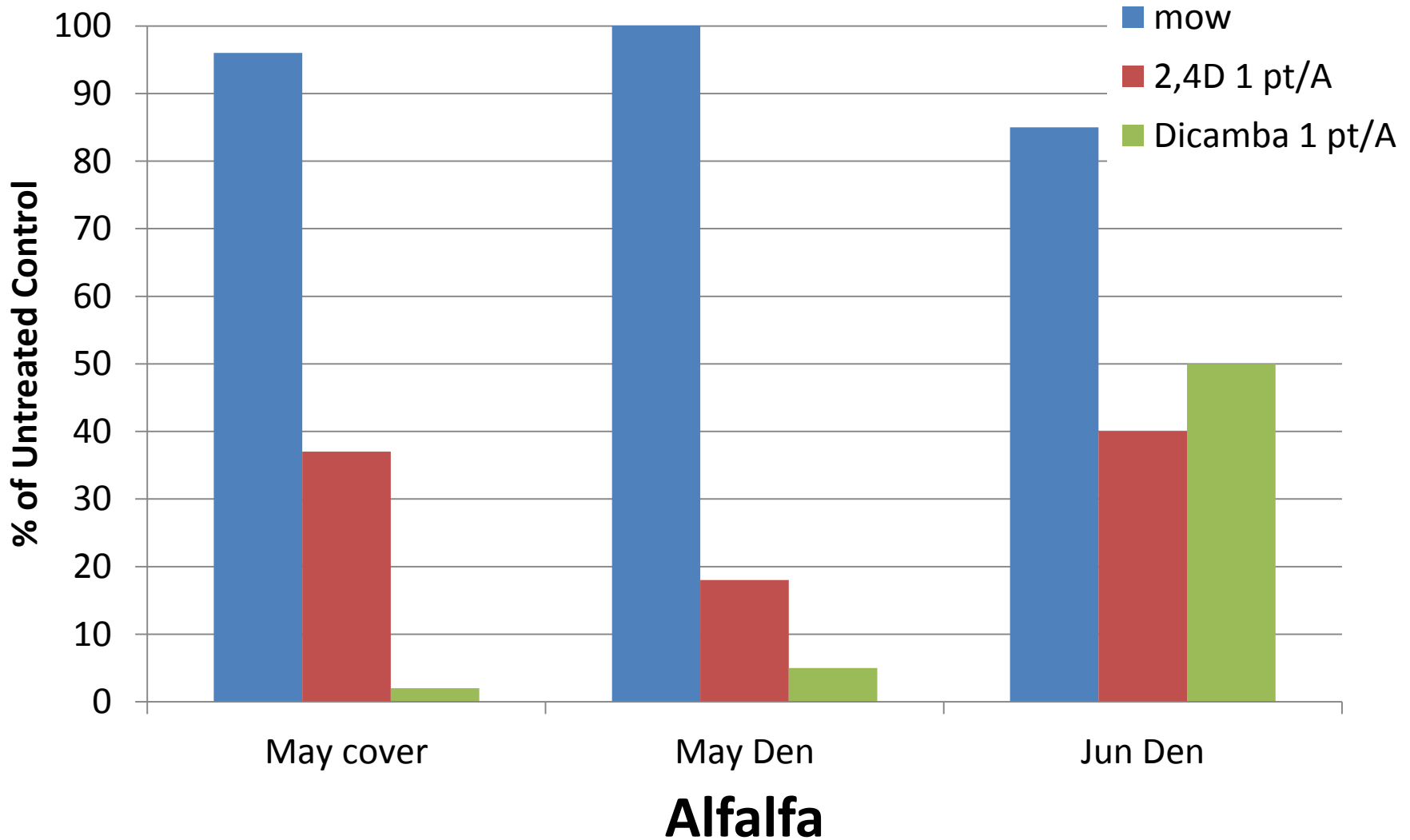
Cover of alfalfa May after fall treatments



alfalfa plants May after fall treatments



A fall application may not eliminate alfalfa



Fall vs spring alfalfa removal

Iowa study

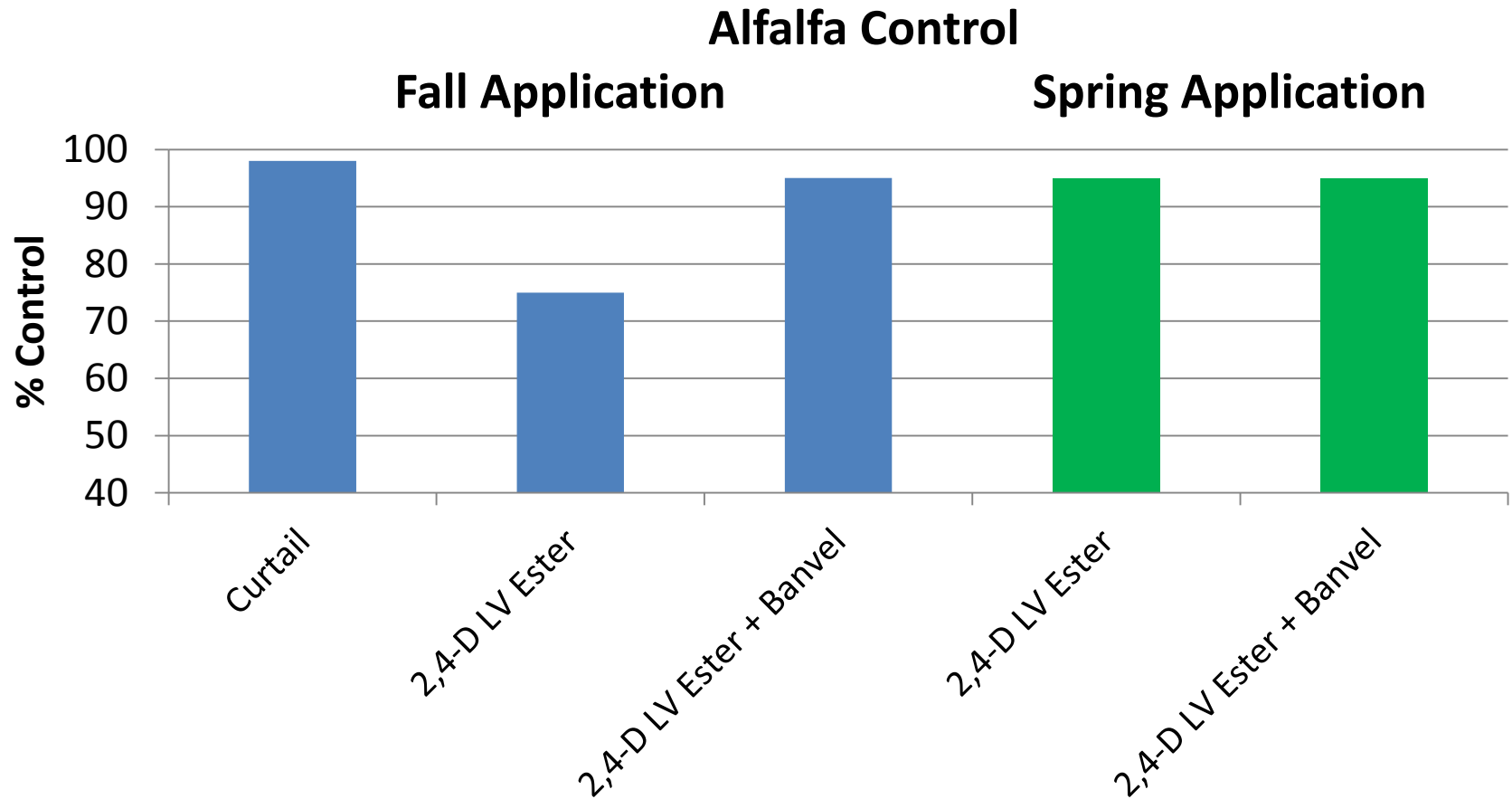
Fall application: 10/11/2001

Spring application: 4/19/2002

Evaluated all treatments 21 days after spring treatment

Treatment	Timing
Curtail 2 pt/A	Fall
2,4-D LV Ester 2 pt/A	Fall
2,4-D LV Ester + Banvel 1 pt/A + 1 pt/A	Fall
2,4-D LV Ester 1 pt/A	Spring
2,4-D LV Ester + Banvel 1 pt/A + 1 pt/A	Spring

Iowa – No Crop Rotation Fall vs Spring Applications



Evaluations were 21 Days after spring treatments!

Spring removal followed by in crop applications for corn

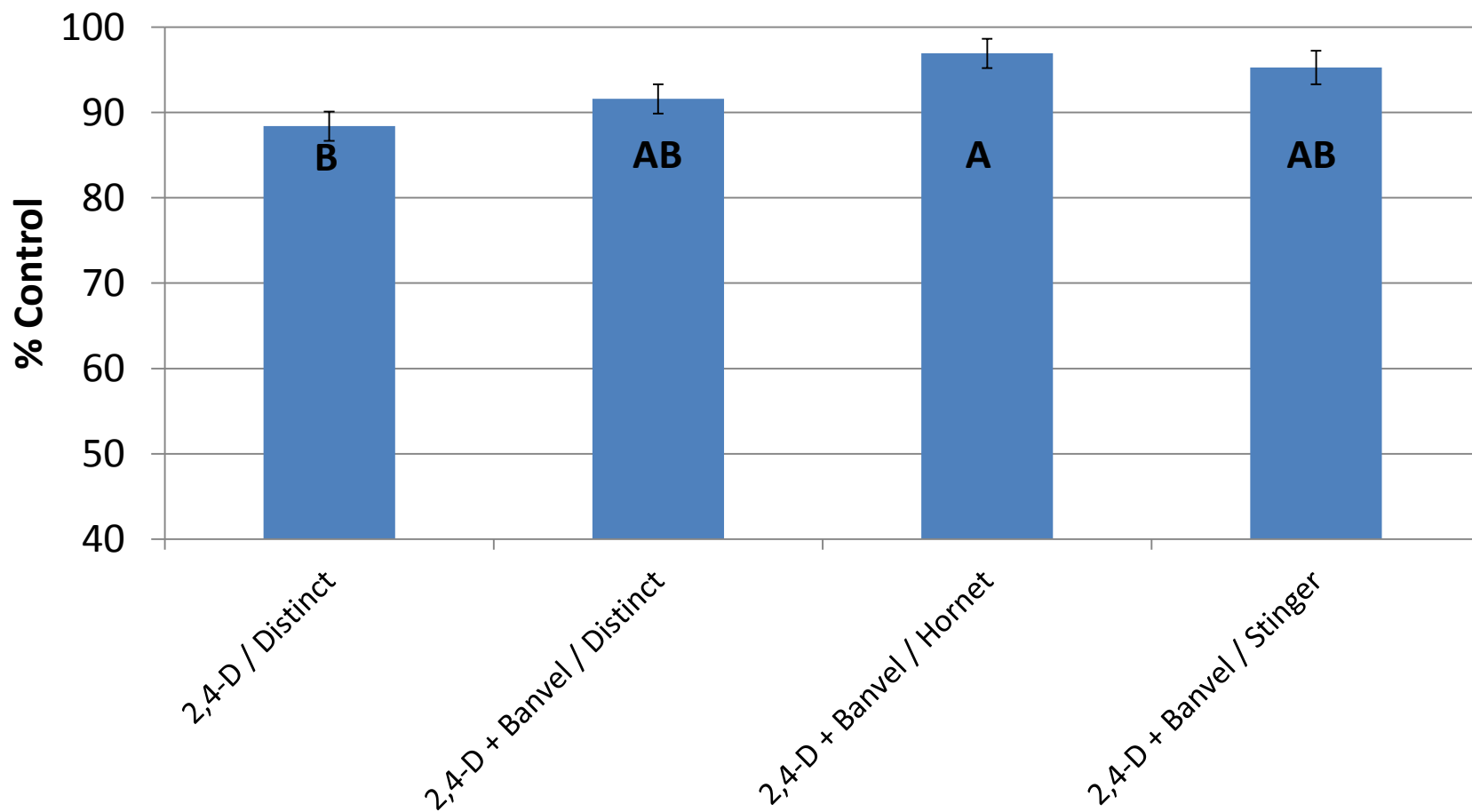
5 sites (IA, IN, NY, PA & WI)

Trt#	Burndown application	In crop application
1	2,4-D LV Ester 2 pt/A	Distinct 6 oz/A
2	2,4-D LV Ester + Banvel 1pt/A + 1 pt/A	Distinct 6 oz/A
3	2,4-D LV Ester + Banvel 1pt/A + 1 pt/A	Hornet 4 oz/A
4	2,4-D LV Ester + Banvel 1pt/A + 1 pt/A	Stinger 0.5 pt/A

NIS and 28-0-0 were included in treatments as recommended.

Spring removal followed by in crop applications for Corn

5 sites (IA, IN, NY, PA & WI)



Summary

- Fall applications are more effective than spring
 - Apply when temps get >50F to avoid reduced control
- While cover in spring may be low, plants may survive and be problematic later
- Scout the following spring in-crop (June)
 - If volunteer alfalfa found applications of systemic herbicide should be planned
 - Avoid relying on contact herbicides (Liberty, gramoxone) or pre herbicides (atrazine)

Plan to manage RR alfalfa in no-till fields

1. Make herbicide application
 - If can't ensure warm temps in fall wait for spring
2. Plant corn
3. Scout field closely before POST application for volunteer RR alfalfa
4. if present include recommended systemic herbicide
 - Dicamba or clopyralid
 - Threshold & yield loss is unknown
5. Scout field again in fall and treat if present at high enough level

Final thoughts

- Roundup Ready alfalfa can be removed from no-till systems
- Use of appropriate herbicides and rates at the correct timing is important
 - Weather and environmental condition can dramatically affect success
 - Don't forgot about other weed species when removing alfalfa (QUACKGRASS)
- Scout fields to prevent volunteer plants from reducing yield in future crops