

**Dry Bean Weed Control Update**  
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**NDSU, Fargo, ND**  
**1/18/2022**



Table 41. Weeds ranked as one of the three worst in dry beans in 2020.

Weed <sup>a</sup>	Respon- dents (no.)	Respon- dents (%)	Acres reported (no.) <sup>b</sup>	Acres reported (%) <sup>b</sup>	Weed <sup>a</sup>	Respon- dents (no.)	Respon- dents (%)	Acres reported (no.) <sup>b</sup>	Acres reported (%) <sup>b</sup>
<b>Minnesota</b>					<b>Northharvest</b>				
Lambsquarters	62	68.9	31,981	68.7	Kochia	87	37.3	65,470	44.8
Waterhemp	49	54.4	22,942	49.3	Lambsquarters	110	47.2	64,700	44.2
Ragweed	46	51.1	22,807	49	Ragweed	84	36.1	52,146	35.6
Red. pigweed	26	28.9	15,464	33.2	Red. pigweed	78	33.5	47,985	32.8
Nightshade	15	16.7	8,496	18.3	Waterhemp	62	26.6	28,524	19.5
Kochia	6	6.7	5,851	12.6	Nightshade	32	13.7	23,864	16.3
Buckwheat	5	5.6	4,595	9.9	Cocklebur	27	11.6	21,061	14.4
Cocklebur	7	7.8	4,091	8.8	Vol. grain	31	13.3	18,629	12.7
Vol. grain	7	7.8	3,998	8.6	Bi. wormwood	26	11.2	17,160	11.7
Pros. pigweed	5	5.6	3,724	8	Canada thistle	23	9.9	15,227	10.4
Bi. wormwood	6	6.7	3,276	7	Foxtail	13	5.6	11,969	8.2
Foxtail	5	5.6	3,257	7	Marestail	21	9	11,879	8.1
Wild mustard	2	2.2	1,249	2.7	Buckwheat	15	6.4	9,711	6.6
Canada thistle	3	3.3	992	2.1	Wild oats	14	6	9,686	6.6
Venice mallow	3	3.3	721	1.5	Wild mustard	16	6.9	7,252	5
Smartweed	2	2.2	480	1	Pro. pigweed	7	3	6,624	4.5
Proso millet	1	1.1	323	0.7	Lance. sage	4	1.7	3,526	2.4
Wild oats	1	1.1	320	0.7	Sunflowers	4	1.7	3,476	2.4
Lance. sage	1	1.1	304	0.7	Vol. canola	3	1.3	2,896	2
White cockle	2	2.2	275	0.6	Venice mallow	4	1.7	2,021	1.4
Clover	1	1.1	200	0.4	Black medic	2	0.9	1,460	1
Sunflowers	1	1.1	150	0.3	Curly dock	1	0.4	1,100	0.8
<b>North Dakota</b>					<b>Smartweed</b>				
Kochia	81	56.6	59,619	59.8	Proso millet	1	0.4	323	0.2
Lambsquarters	48	33.6	32,719	32.8	Chamomile	1	0.4	311	0.2
Red. pigweed	52	36.4	32,521	32.6	White cockle	2	0.9	275	0.2
Ragweed	38	26.6	29,339	29.4	Clover	1	0.4	200	0.1
Cocklebur	20	14	16,970	17	Stinkgrass	1	0.4	120	0.1
Nightshade	17	11.9	15,368	15.4					
Vol. grain	24	16.8	14,631	14.7					
Canada thistle	20	14	14,235	14.3					
Bi. wormwood	20	14	13,884	13.9					
Marestail	21	14.7	11,879	11.9					
Wild oats	13	9.1	9,366	9.4					
Foxtail	8	5.6	8,712	8.7					
Wild mustard	14	9.8	6,003	6					
Waterhemp	13	9.1	5,582	5.6					
Buckwheat	10	7	5,116	5.1					
Sunflowers	3	2.1	3,326	3.3					
Lance. sage	3	2.1	3,222	3.2					
Pro. pigweed	2	1.4	2,900	2.9					
Vol. canola	3	2.1	2,896	2.9					
Black medic	2	1.4	1,460	1.5					
Venice mallow	1	0.7	1,300	1.3					
Curly dock	1	0.7	1,100	1.1					
Chamomile	1	0.7	311	0.3					
Stinkgrass	1	0.7	120	0.1					

<sup>a</sup>Ranked as No. 1, 2 or 3 weed by respondents.

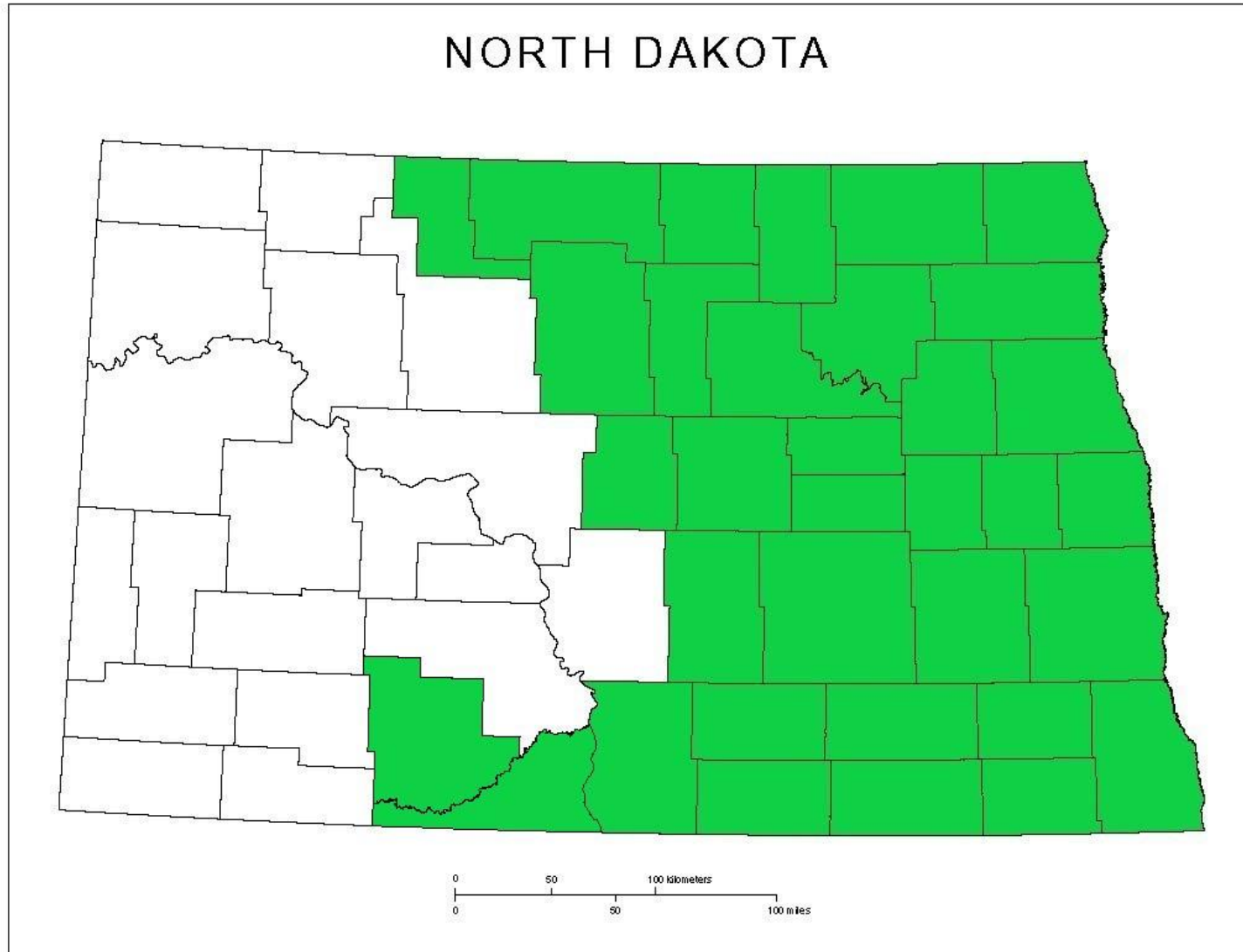
<sup>b</sup>Respondents' acres only.

<sup>c</sup>Weed problem may not have been present across all reported acres.

- Waterhemp is ranked among worst weeds in dry beans

- Primarily resistant to glyphosate + ALS inhibitors
- Minimal PPO-inhibitor resistance

# Waterhemp Distribution



# Waterhemp Trials 2021

- Two experiments in Fargo
  - Planted 'ND Palomino' May 10
- PPI and PRE experiment
  - Incorporation depth of 4" cm
  - 0.23" rainfall on May 20
  - 1.02" rainfall on June 7/8
- POST experiment
  - Blanket PPI of Eptam + Sonalan (3 pt/A + 2 pt/A)
  - POST treatments applied to 2" waterhemp



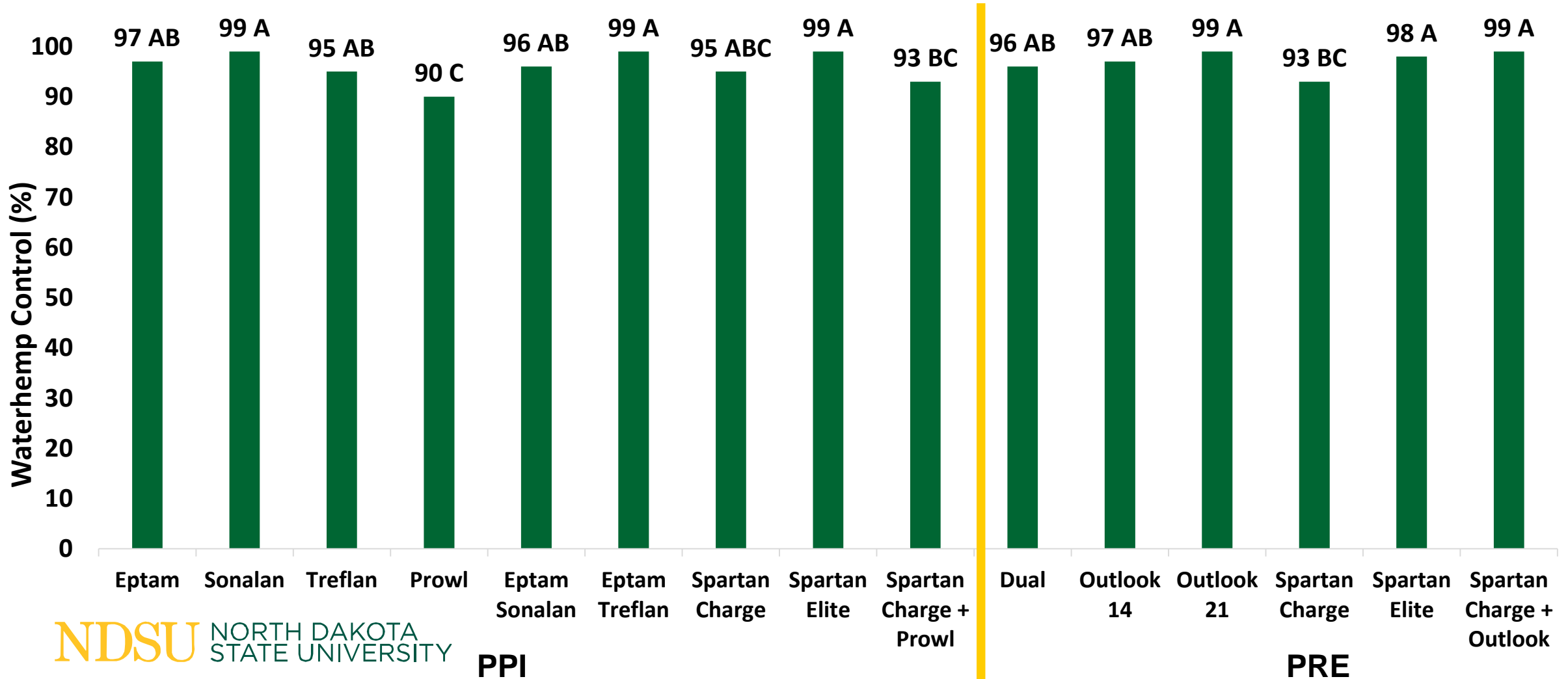
# Treatments – PPI

<b>Product</b>	<b>Rate (Product /A)</b>
<b>Eptam 7E</b>	4 pt
<b>Sonalan HFP</b>	3 pt
<b>Treflan HFP</b>	1.5 pt
<b>Prowl H<sub>2</sub>O</b>	3 pt
<b>Eptam 7E + Sonalan HFP</b>	3 pt + 2 pt
<b>Eptam 7E + Treflan HFP</b>	3 pt + 1.5 pt
<b>Spartan Charge</b>	5 fl oz
<b>Spartan Elite</b>	25 fl oz
<b>Spartan Charge + Prowl H<sub>2</sub>O</b>	4 fl oz + 1.5 pt

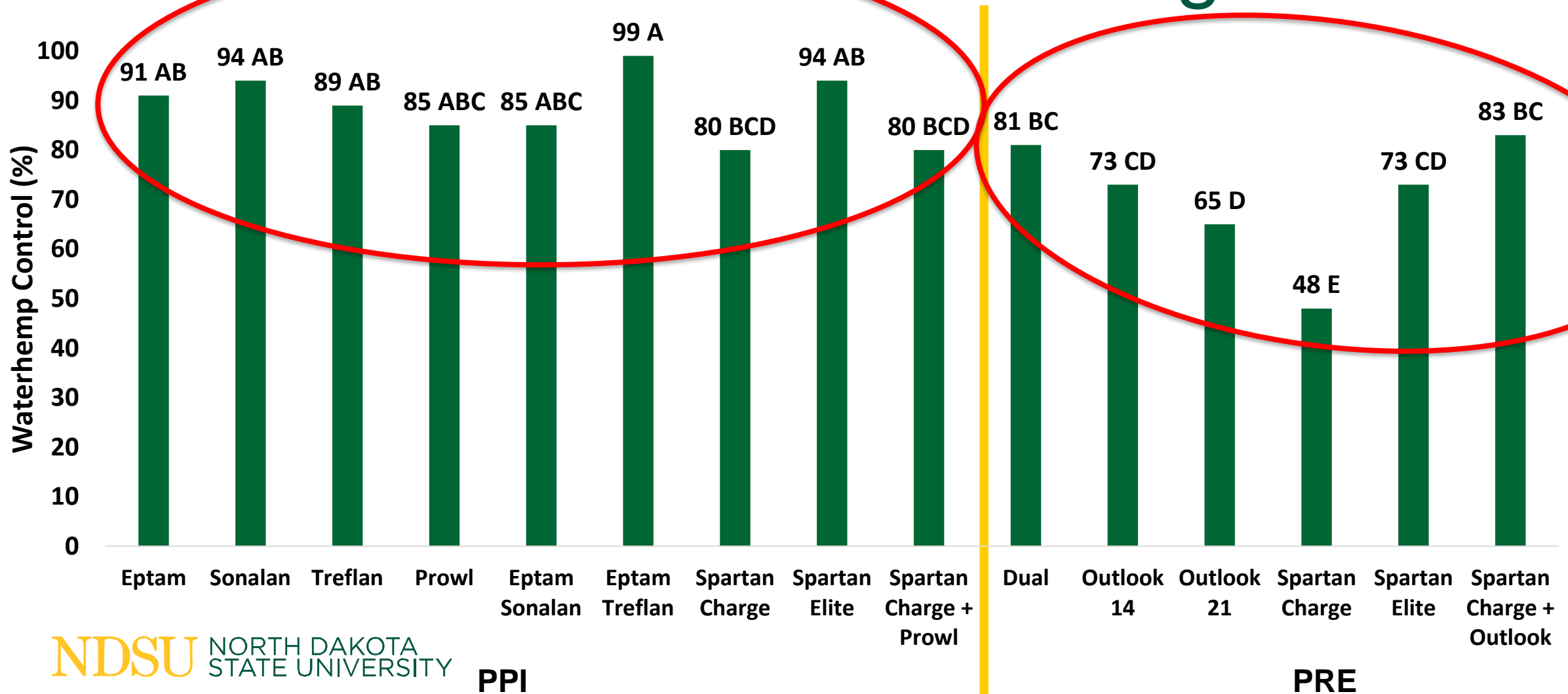
# Treatments – PRE

<b>Product</b>	<b>Rate (Product /A)</b>
<b>Dual II Magnum</b>	2 pt
<b>Outlook</b>	14 fl oz
<b>Outlook</b>	21 fl oz
<b>Spartan Charge</b>	5 fl oz
<b>Spartan Elite</b>	25 fl oz
<b>Spartan Charge + Outlook</b>	4 fl oz + 14 fl oz

# PPI/PRE Results – 4 Weeks After Planting



# PPI/PRE Results – 8 Weeks After Planting

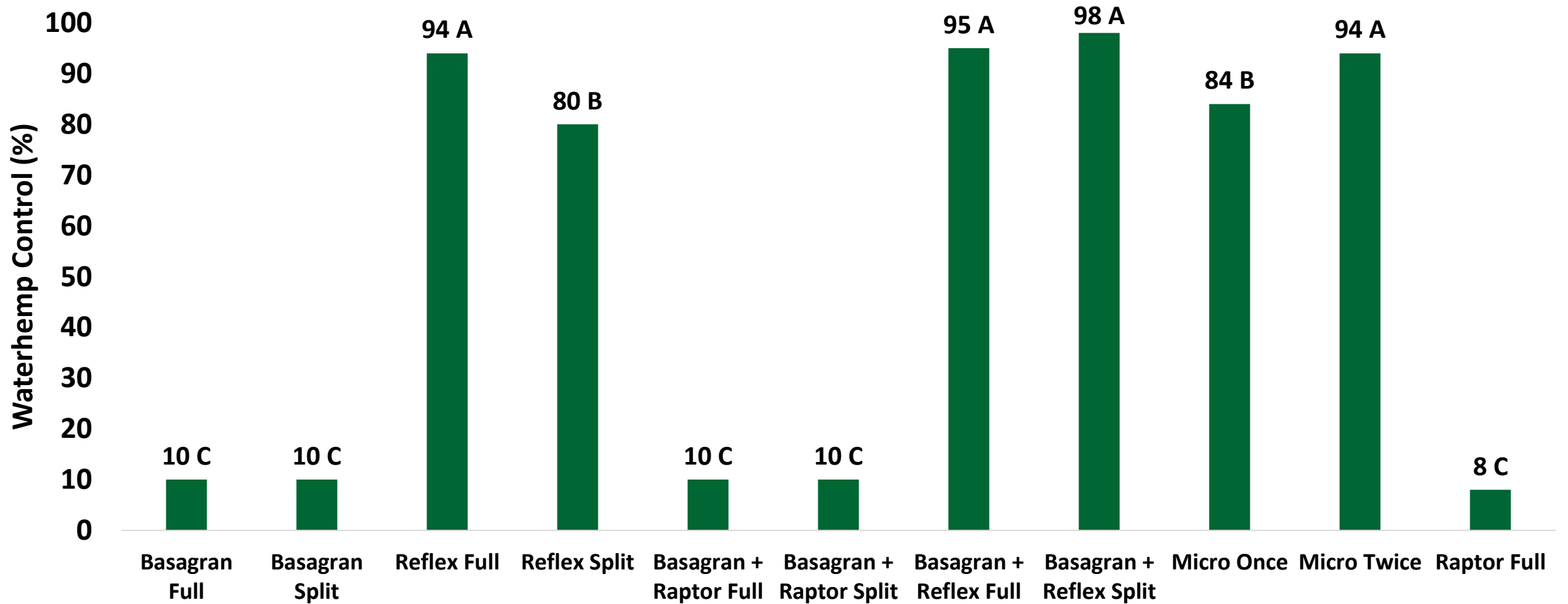




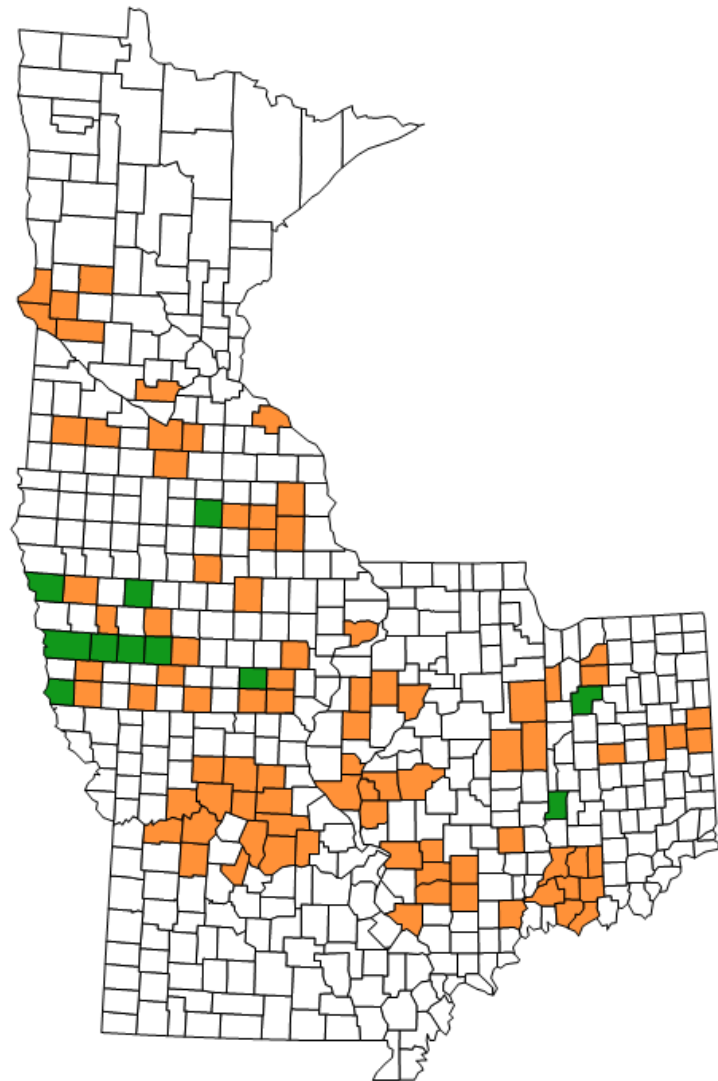
# Treatments – POST

Product	Rate (Product /A)
Basagran 5L	1.6 pt 0.8 pt fb 0.8 pt
Reflex	12 fl oz 6 fl oz fb 6 fl oz
Basagran 5L + Raptor	1.6 pt + 4 fl oz 0.8 pt + 2 fl oz fb 0.8 pt + 2 fl oz
Basagran 5L + Reflex	1.6 pt + 12 fl oz 0.8 pt + 6 fl oz fb 0.8 pt + 6 fl oz
Basagran 5L + Raptor+ Reflex (NDSU Microrate)	0.56 pt + 2 fl oz + 4 fl oz 0.56 pt + 2 fl oz + 4 fl oz fb 0.56 pt + 2 fl oz + 4 fl oz
Raptor	4 fl oz

# POST Results – 4 Weeks After Initial Treatment



# Waterhemp Populations with Group 14 Resistance



Resistant		
Total	Whole Plant	$\Delta G210$
Populations (no.)		
148	126	125

■  $\Delta G210$  present

■  $\Delta G210$  absent



# Waterhemp Control in Dry Beans

(assuming it is glyphosate and ALS resistant but not PPO resistant)

- Start clean and use residuals at planting
  - Sulfentrazone (Spartan)
  - Metolachlor (Dual), dimethenamid (Outlook), anything yellow
- **TIMELY** post treatments + another layer of residual
  - Reflex + dimethenamid (Outlook)

# Waterhemp Control in Dry Beans

(assuming it is glyphosate and ALS resistant AND PPO resistant)

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  - ~~Reflex~~ + dimethenamid (Outlook)

# Conclusions and Implications

- Several effective PPI herbicides for waterhemp control 8 WAP
  - Conducted during severe drought
- POST programs must utilize fomesafen
  - Full rate once
  - Reduced rates 7 days apart
- Several herbicide options for control of ALS-inhibitor resistant waterhemp



# Current and Future Work

- Repeat work in 2022 and beyond
  - Replicate work on Palmer amaranth
- Determine ideal timing for layered residual application



Questions?

