



HBI961W4-2018US Bicylcopryrone: Crop tolerance and weed control in wormwood (spring initiated trial)

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2018 Crop Protection Field Development

Last Updated: Oct-02-2018

Acknowledgements and Test Locations:

Trial	State	Cooperator/ Syngenta Rep	Crop	IH/ CRO/ COI	Included in Summary
USNL0H0122018	MI	Bounds Ryan	Newly Seeded	IH	Yes
USNL0H0132018	MI	Bounds Ryan	Established	IH	Yes
USNL0H0292018	MI	Bounds Ryan	Newly Seeded	IH	Yes

Objectives:

- Is bicyclopyrone (BIR) safe to established or newly seeded wormwood?
- Compared to BIR + NIS alone, does a treatment of BIR + NIS + AMS or BIR + COC + AMS provide better weed control while remaining safe to wormwood?

Treatment List: Established and newly seeded wormwood

A timing: Pre-emergence/early-green up

1. Untreated Check
2. A16003E 50 gai/ha
3. A16003E 100 gai/ha

BC timing: Early Post-emergence / DE timing Late Post-emergence

- 4/10. A16003E 50gai/ha + Activator 90 0.25% v/v
- 5/11. A16003E 50gai/ha + Activator 90 0.25% v/v + N-Pak 2.5% v/v
- 6/12. A16003E 50gai/ha + R.O.C 1.0% v/v + N-Pak 2.5% v/v
- 7/13. A16003E 100gai/ha + Activator 90 0.5% v/v
- 8/14. A16003E 100gai/ha + Activator 90 0.5% v/v + N-Pak 5.0% v/v
- 9/15. A16003E 100gai/ha + R.O.C 2.0% v/v + N-Pak 5.0% v/v

Established Wormwood: Background

- Challenges:
 - Limited herbicide options
 - Annual, biennial, and perennial weeds
 - Many herbicides that wormwood tolerates, Ambrosia species tolerates as well
- Planting Date: Late August – Mid September
 - 4 row vegetable vacuum planter on 40 inch rows
 - Planting population 300,000+ seeds per acre
 - Established population 8,000-15,000 per acre



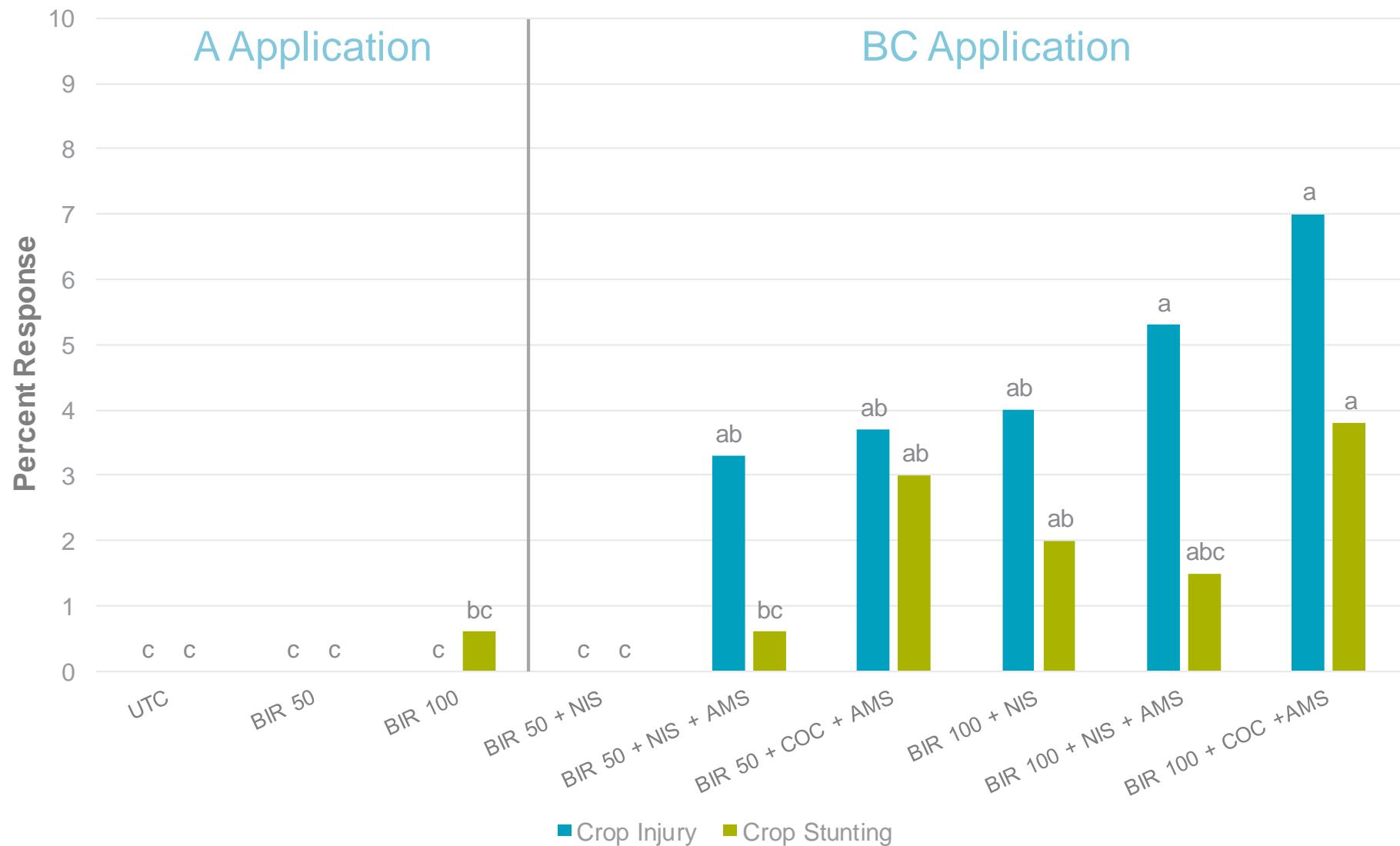
Established Wormwood: 2018 Trial

- Field planted September 15, 2016
- Applications/Crop stage:
 - Application A: 1-1.5 inches of new growth (4/20/2018)
 - Application B/C: 3-5 inches of new growth (5/11/2018)
 - Application D/E: 10-14 inches of new growth (5/23/2018)
- Soil: Sandy Loam
 - pH 7.5
 - 4.7% Organic Matter
- A Application:
 - No injury or stunting during the course of the study

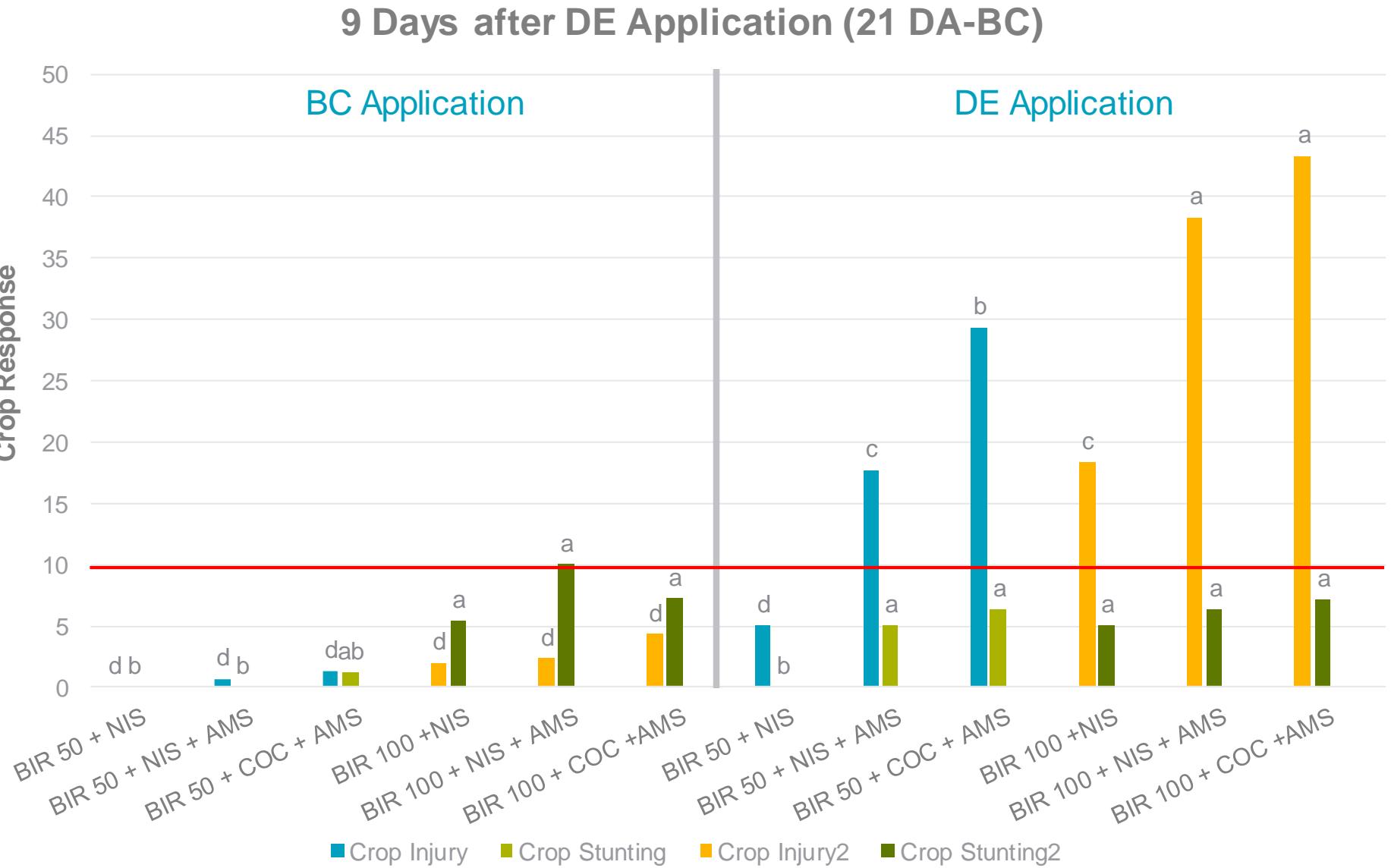


Results

7 Days after BC Application (27 DA-A)

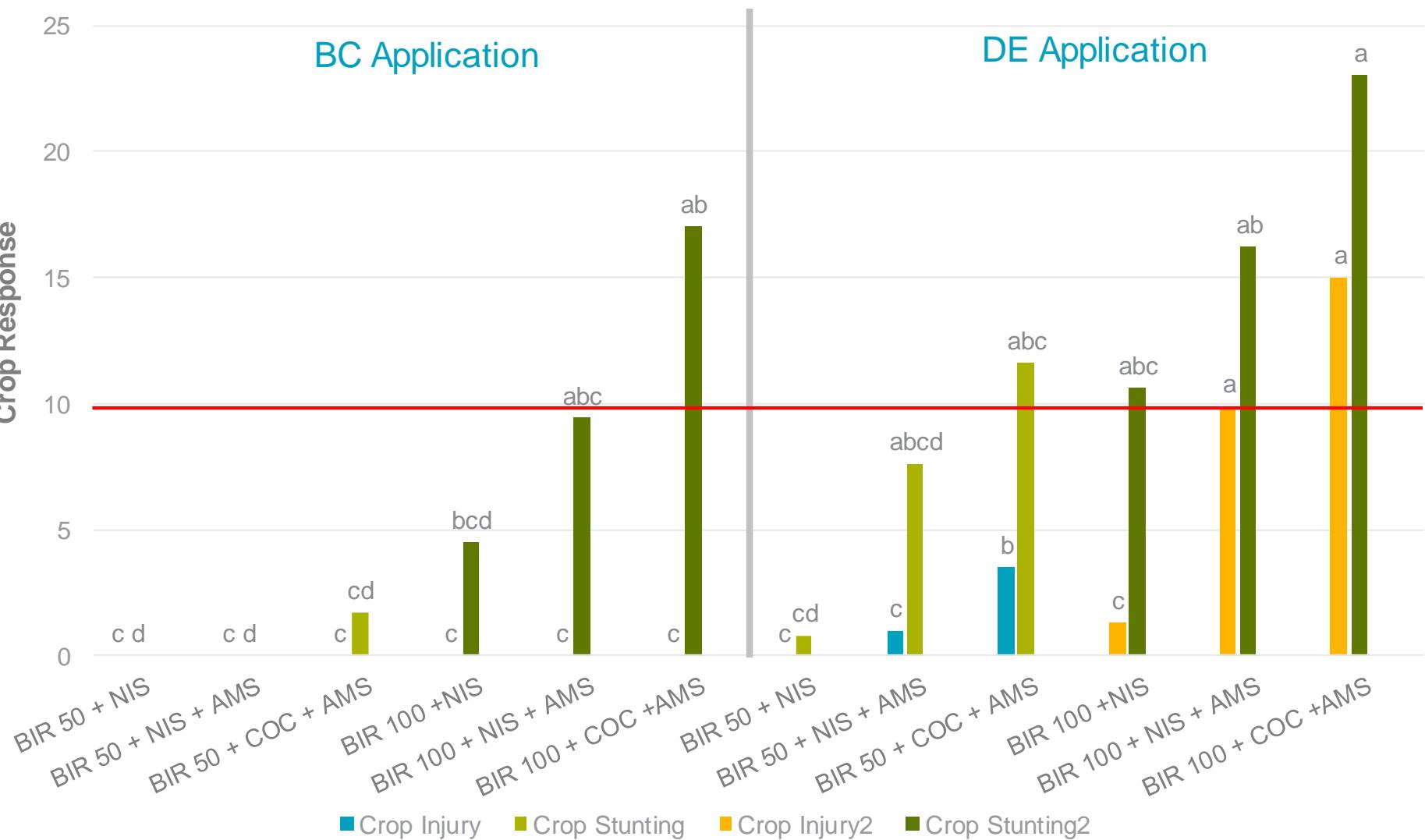


Results



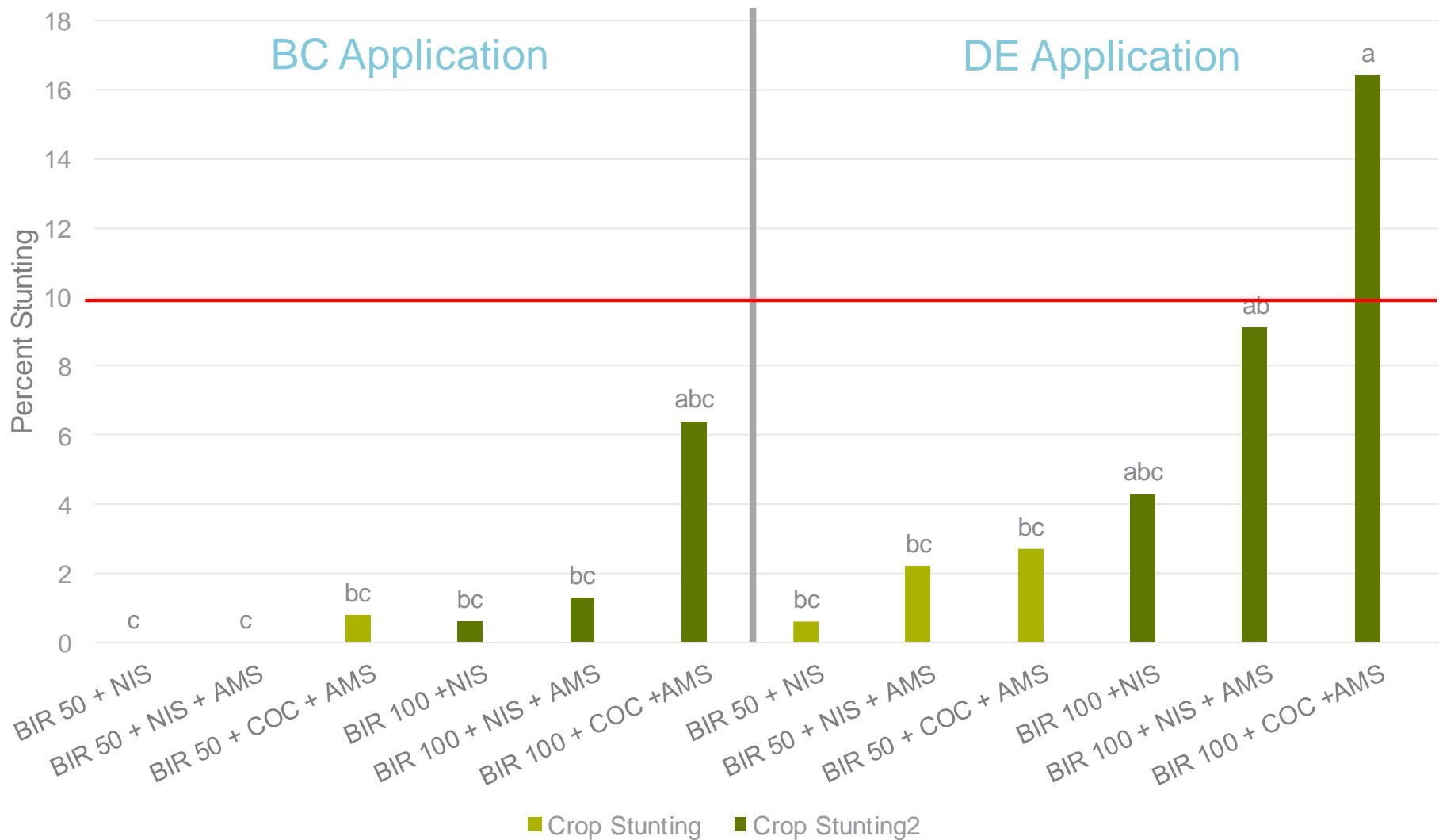
Results

28 Days after DE Application (40 DA-BC)



Stunting Results Prior to Harvest

55 Days after DE Application Crop Stunting (67 DA-BC)



Treatment 6 (B): N-Pak @ 2.5% v/v + BIR 50 gai/ha + COC 1.0% v/v



21 Days after
Application

Treatment 12 (D): N-Pak @ 2.5% v/v + BIR 50 gai/ha + COC 1.0% v/v



9 Days after
Application

Treatment 15 (DE): N-Pak @ 5% v/v + BIR 100 gai/ha + COC 2.0% v/v



9 Days after
Application

Newly Seeded Wormwood: Background

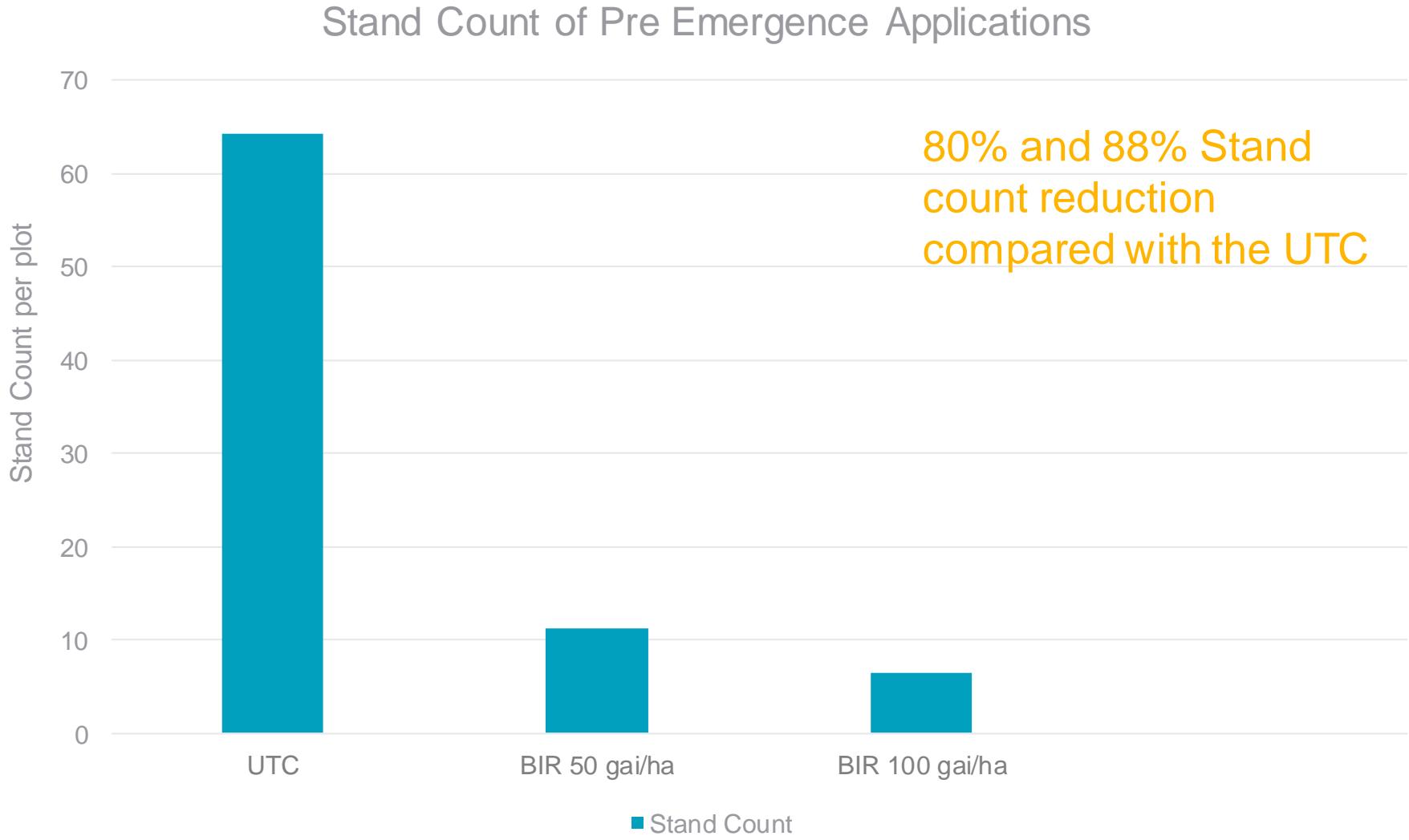
- Wheat or Rye is planted after wormwood to prevent erosion during winter. This is control in spring by clethodim.
- Newly seeded wormwood is often mowed 1 or 2 times prior to a Gramoxone application with a tunnel sprayer to control weeds through the first growing season. Atrazine can be applied to 6-10 inch tall wormwood.
- No harvest is taken during the first season.
- Challenges: 2018 Trial
 - Variable crop growth stages
 - Poor Stand
 - Weeds often out compete newly seeded wormwood
 - This location had to be abandoned after the 1st rating which was 55 DA-A application.

Newly Seeded Wormwood:

- Planting Dates:
 - H012:
 - September 20th, 2017
 - January 20th, 2018
- Application/Crop Stage:
 - H012:
 - Pre Emerged Wormwood
 - 4/20/2018
- Soil:
 - Clay Loam
 - pH: 6.9
 - 3.2% Organic Matter



Results:



Untreated Check



BIR at 50 gai/ha applied 55 days prior to picture



View across the field



Treatments: Newly Seeded Wormwood (Bonus Trial)

AB timing: Early Post-emergence / **CD timing** Late Post-emergence

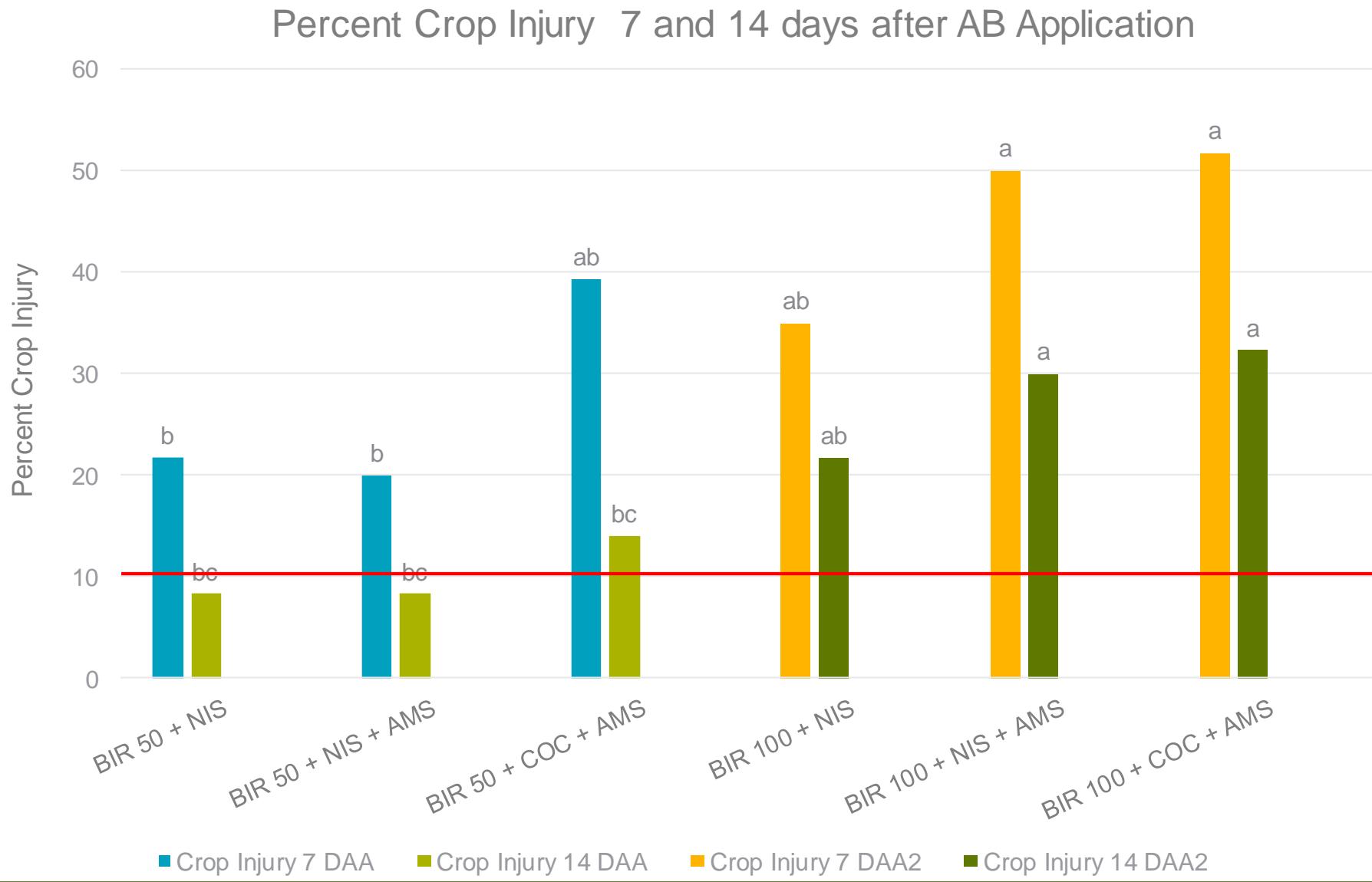
- 2/8. A16003E 50gai/ha + Activator 90 0.25% v/v
- 3/9. A16003E 50gai/ha + Activator 90 0.25% v/v + N-Pak 2.5% v/v
- 4/10. A16003E 50gai/ha + R.O.C 1.0% v/v + N-Pak 2.5% v/v
- 5/11. A16003E 100gai/ha + Activator 90 0.5% v/v
- 6/12. A16003E 100gai/ha + Activator 90 0.5% v/v + N-Pak 5.0% v/v
- 7/13. A16003E 100gai/ha + R.O.C 2.0% v/v + N-Pak 5.0% v/v

Newly Seeded Wormwood:

- Planting Dates: Hand Spread
 - H029: June 28th, 2018
- Application/Crop Stage:
 - H029: Weeds Mowed prior to each Application
 - Application A/B: 0.5-3 inch wormwood plants (8/7/2018)
 - Application C/D: 3-6 inch wormwood plants (9/13/2018)
- Soil:
 - Sandy Loam
 - pH: 6.4
 - 3.6% Organic Matter

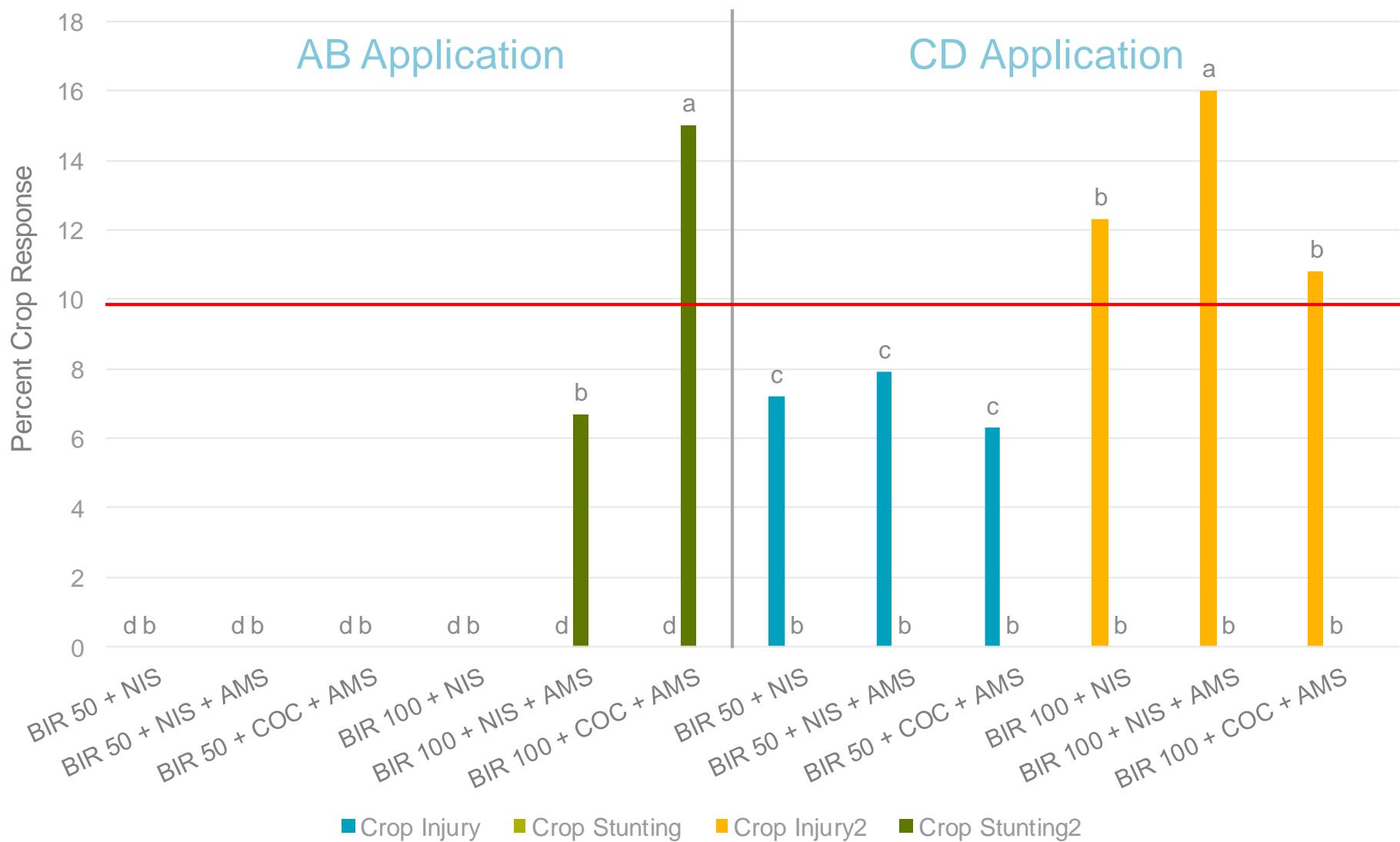


Results



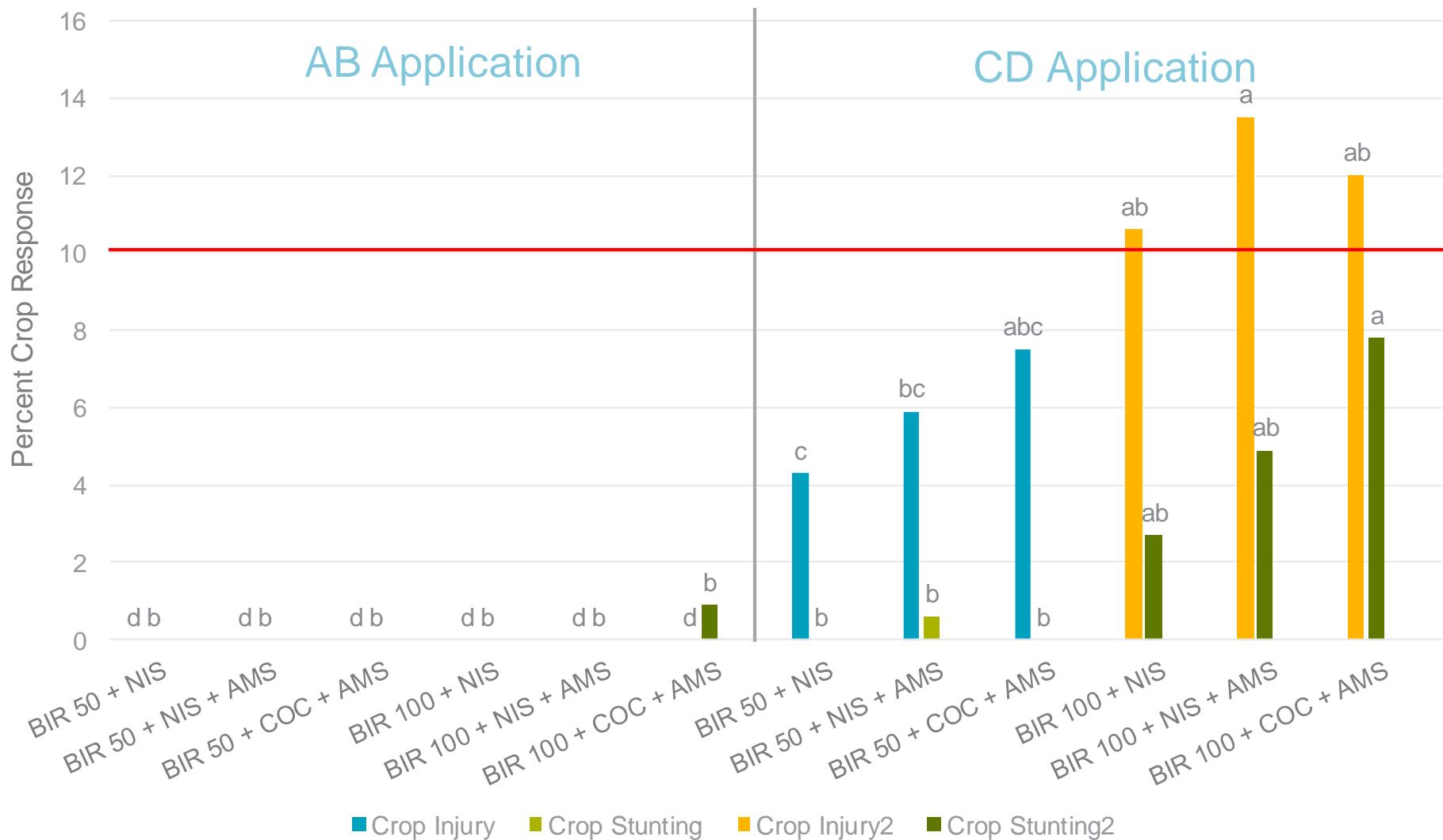
Results

8 Days after CD Application (45 DA-AB)



Results

42 Days after CD Application (80 DA-AB)



Untreated Check



Trt 4: BIR 50 gai/ha + COC +AMS



Trt 6: BIR 100 gai/ha + NIS + AMS



Trt 7: BIR 100 gai/ha + COC + AMS



Summary:

- Is bicyclopyrone (BIR) safe to established or newly seeded wormwood?
 - The only application timing to not express injury symptoms was in the established wormwood trial where 1.5 inches of new growth or less present. BIR does cause injury to both established and newly seeded wormwood at pre emerged and all other plant stages. However there are only 2 timings of concern. Pre-emergence on newly seeded wormwood and greater than 10 inch established wormwood.
- Compared to BIR + NIS alone, does a treatment of BIR + NIS + AMS or BIR + COC + AMS provide better weed control while remaining safe to wormwood?
 - Due to weed variability and mowing weed control rates were not recorded. However, a general observation showed that both BIR+NIS+AMS and BIR+COC+AMS provided better weed control. BIR+COC+AMS greatly outperformed BIR+NIS+AMS and BIR+NIS.

Recommendations:

- Move forward with BIR+COC+AMS treatment. Best observed weed control and the crop damage is not great enough for concern.
- In newly seeded wormwood trials where weed control is the primary objective, post applications need to be based on weed height, rather than wormwood height. Weeds tend to grow about 5 times faster than newly seeded wormwood.
- Consider other tank mixture partners for better weed control. Atrazine, prowl, command, atrazine + s-moc, etc.
- On established wormwood, consider harvesting a few select treatments to determine if crop injury and stunting is reflected in yields.