Kochia Control in Soybean in Southwest ND

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Soybean in Southwest ND

- Planted soybean acres have been increasing each year in SW ND
  - No-till planted
  - Low rainfall environment = less competitive with weeds
    - Row closure is infrequent for 30-inch row soybean
    - Lower seeding population is common
    - Yield averages between 20 and 30 bushels per acre
  - Kochia is probably biggest weed problem for soybean in SW ND
    - Several emergence flushes during planting season (with each rain event)
    - Small kochia are difficult to control even without herbicide resistant biotypes
    - Herbicide resistant biotypes are becoming more common in ND

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    - Small kochia are difficult to control even without herbicide resistant biotypes
    - Herbicide resistant biotypes are becoming more common in ND
    - Cannot rely on a single application or mode of action

Preplant Timing for Kochia Control

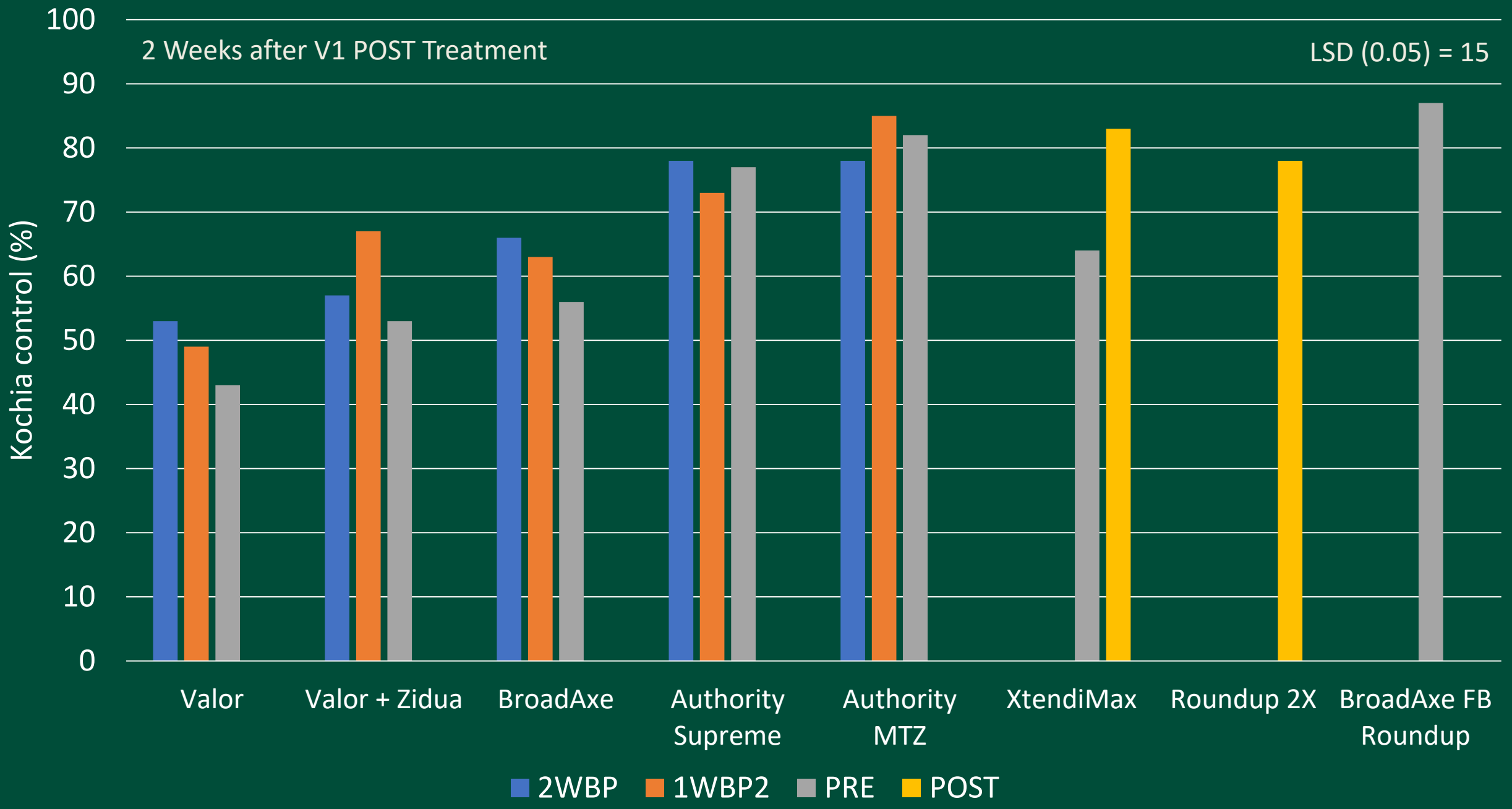
- Treatments were applied 3 and 2 weeks before planting (May 6 and May 16) and at planting (May 28); HSOC included with all treatments
  - Valor (3 oz/A) plus glyphosate (Roundup PowerMax3; 20 oz/A)
  - Valor plus glyphosate plus Zidua SC (5 oz/A)
  - BroadAxe XC (32 oz/A) plus glyphosate
  - Authority Supreme (9.8 oz/A) plus glyphosate
  - Authority MTZ (18 oz/A) plus glyphosate
- Compared with some standard POST treatments and untreated
  - Xendimax (22 oz/A) plus glyphosate (plus required adjuvants)
    - At planting vs at V1 soybean (June 23)
  - Glyphosate (at planting) followed by glyphosate (at V1 soybean)
  - BroadAxe XC plus glyphosate (at planting) followed by glyphosate (V1)
- A POST application of glyphosate at the R1 growth stage to all treatments

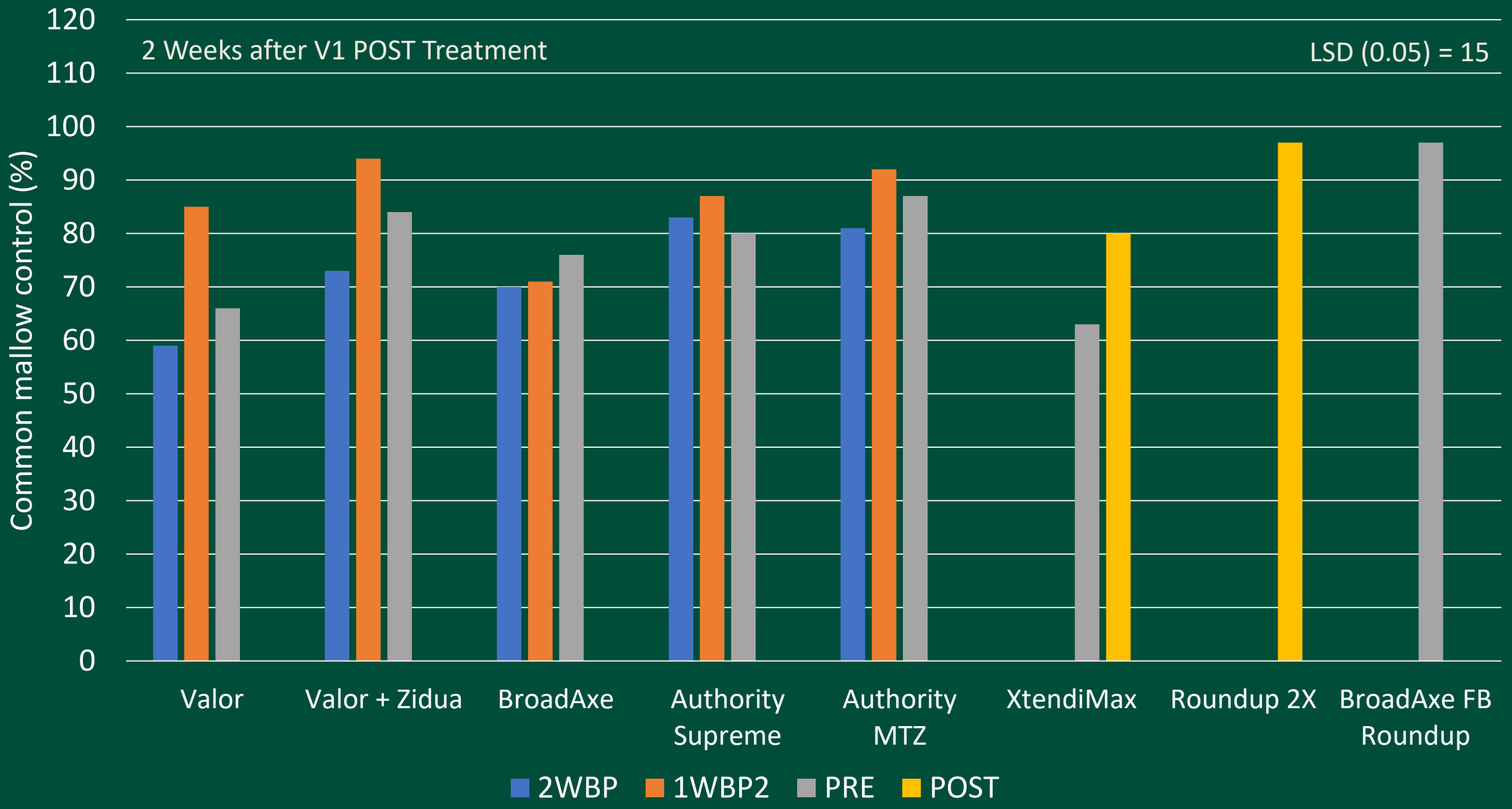
Preplant Timing for Kochia Control

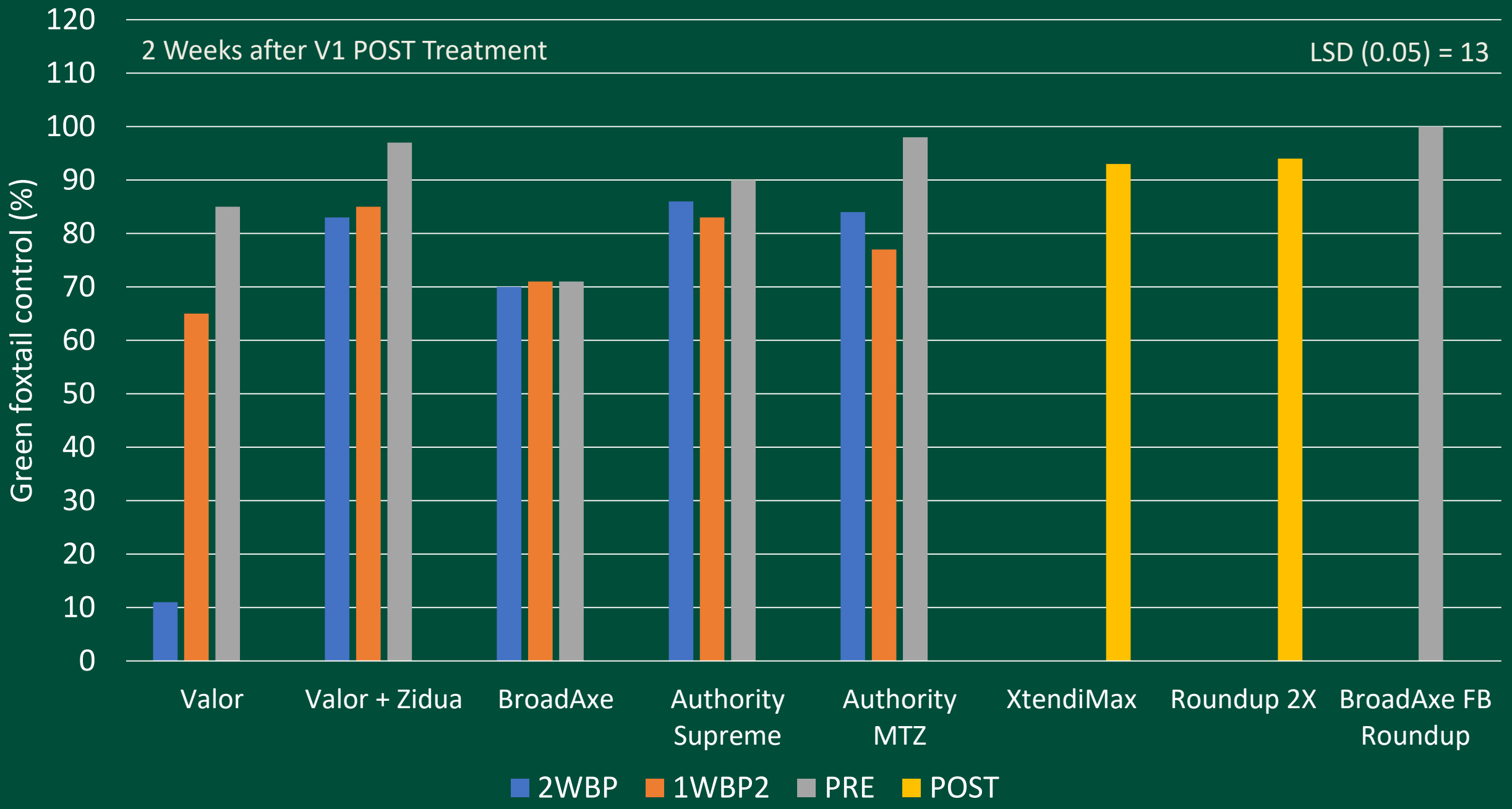
- Soybean:
  - Xtendiflex AG09XFO: 01072322
  - 100,000 Seeds per acre
  - 30-inch rows (John Deere planter)

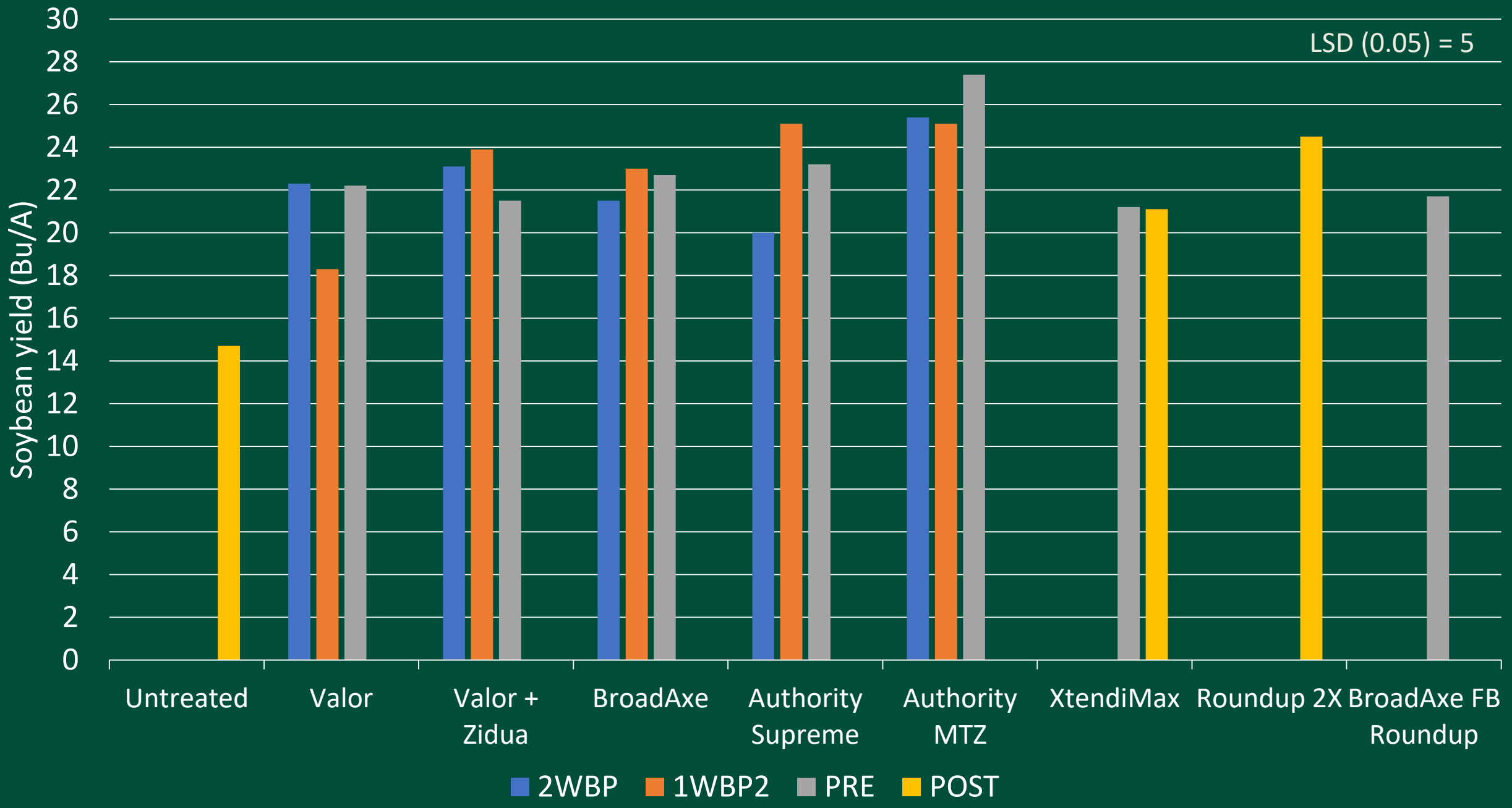
Environmental conditions at time of treatment:

- May 6:
  (3 wk before planting)
  - Time of day: 5:00 PM
  - Temperature: 71 F
  - RH: 43%
  - Wind speed: 8 MPH (ESE)
  - Soil Temp: 63 F
  - Cloud cover: 70%
  - Rainfall 1 wk: 1.24
- May 16
  (2 wk before planting)
  - Time of day: 11:50 AM
  - Temperature: 72 F
  - RH: 37%
  - Wind speed: 9 MPH (SE)
  - Soil Temp: 57 F
  - Cloud cover: 10%
  - Rainfall 1 wk: 0.5
- May 28
  (at planting)
  - Time of day: 10:10 AM
  - Temperature: 75 F
  - RH: 46%
  - Wind speed: 3 MPH (E)
  - Soil Temp: 58 F
  - Cloud cover: 95%
  - Rainfall 1 wk: 0.36
- June 23
  (V1 soybean)
  - Time of day: 3:07 PM
  - Temperature: 87 F
  - RH: 37%
  - Wind speed: 6 MPH (SSE)
  - Soil Temp: 81 F
  - Cloud cover: 20%
  - Rainfall 1 wk: 0.02


2 Weeks after V1 POST Treatment
LSD (0.05) = 15
Kochia control (%)
100
90
80
70
60
50
40
30
20
10
0
Valor
Valor + Zidua
BroadAxe
Authority Supreme
Authority MTZ
XtendiMax
Roundup 2X
BroadAxe FB Roundup
2WBP
1WBP2
PRE
POST


2 Weeks after V1 POST Treatment
LSD (0.05) = 15
Common mallow control (%)
120
110
100
90
80
70
60
50
40
30
20
10
0
Valor
Valor + Zidua
BroadAxe
Authority Supreme
Authority MTZ
XtendiMax
Roundup 2X
BroadAxe FB Roundup
2WBP
1WBP2
PRE
POST


2 Weeks after V1 POST Treatment
LSD (0.05) = 13
Green foxtail control (%)
120
110
100
90
80
70
60
50
40
30
20
10
0
Valor
Valor + Zidua
BroadAxe
Authority Supreme
Authority MTZ
XtendiMax
Roundup 2X
BroadAxe FB Roundup
2WBP
1WBP2
PRE
POST


LSD (0.05) = 5
Soybean yield (Bu/A)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
Untreated
Valor
Valor + Zidua
BroadAxe
Authority Supreme
Authority MTZ
XtendiMax
Roundup 2X
BroadAxe FB Roundup
2WBP
1WBP2
PRE
POST

Untreated

Valor plus Glyphosate at planting

BroadAxe XC plus Glyphosate at planting

Authority Supreme plus Glyphosate at planting

Authority MTZ plus Glyphosate at planting

Xtendimax plus Glyphosate at Planting

Xtendimax plus Glyphosate at V1

Glyphosate at planting FB Glyphosate at V1

Conclusion

- Treatments providing over 80% kochia control
  - Authority MTZ (2 WBP and At planting)
  - Xtendimax plus glyphosate (V1 soybean)
  - BroadAxe XC plus glyphosate (At planting) followed by glyphosate (V1)
- Most preplant and at planting treatments provided poor kochia control
  - Needed the R1 glyphosate application to rescue yield
- It was a difficult year for controlling kochia with preplant/at plant treatments
  - Normal to above normal precipitation (April-4.00 inches; May-2.27 inches)
  - Cool soil temperatures (42 to 62 F; average 53 F)

Thank You!

Thank you to the North Dakota Soybean Council for supporting this research