The Effect of Simulated Hail on Sunflower Health

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Yield loss

- Hail can affect…
  - Population
  - Head size
  - Seed size
  - Oil content

…depending on hail event

But also…

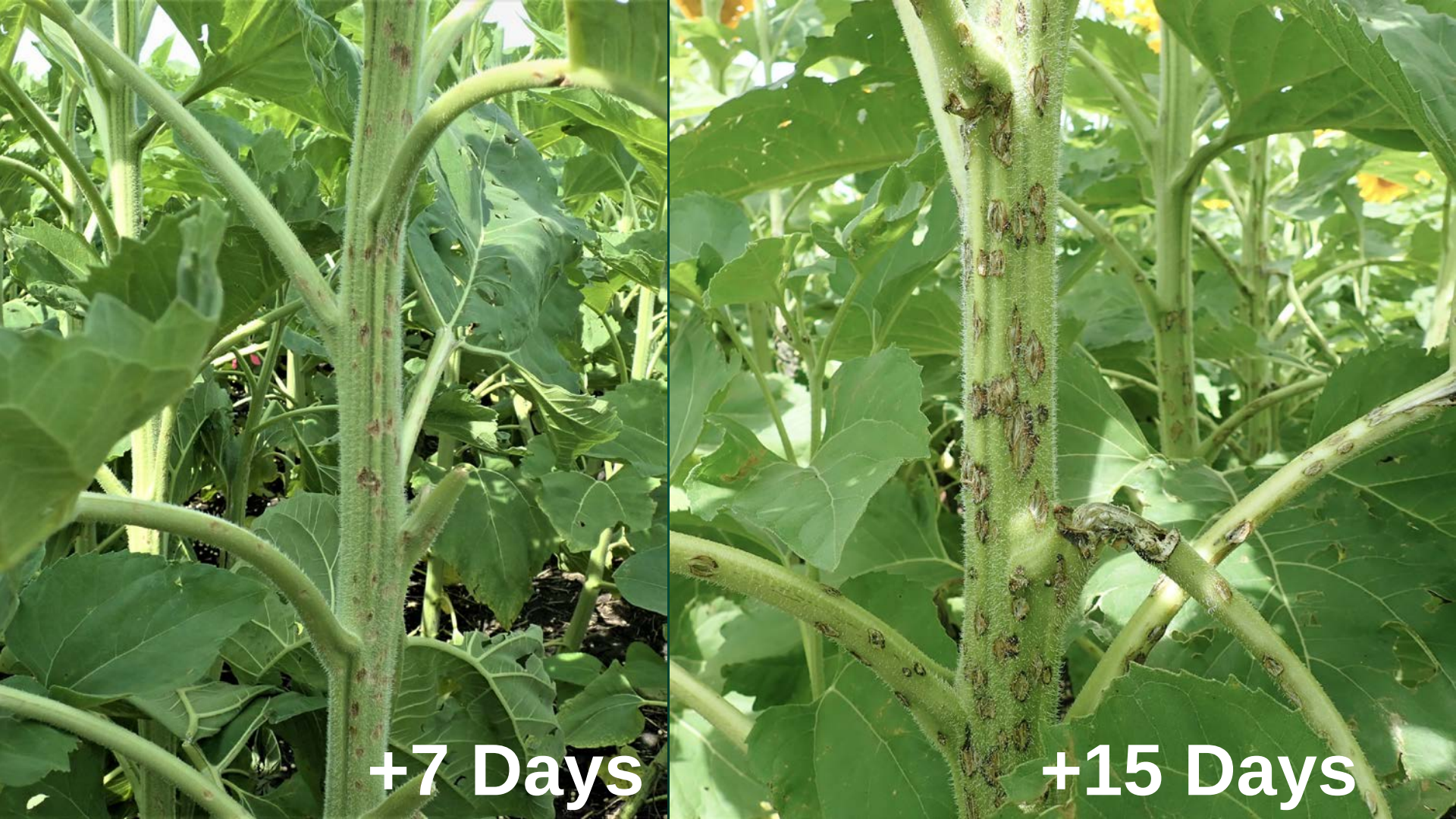
- Pathogens infect through wounds and openings
- Hail creates many wounds
- Questions/concerns about hail
- Questions/concerns about fungicide

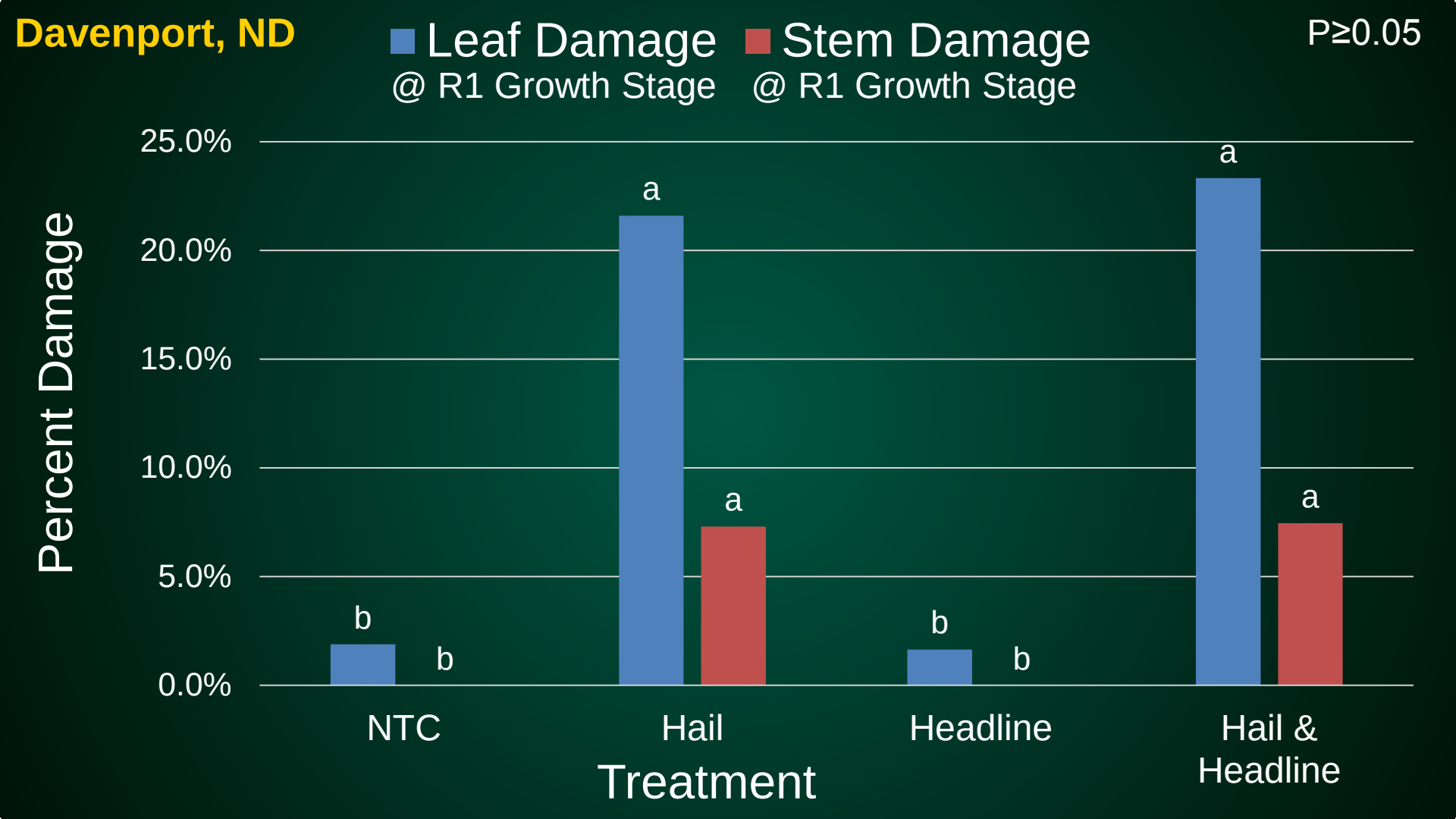
Experimental Design

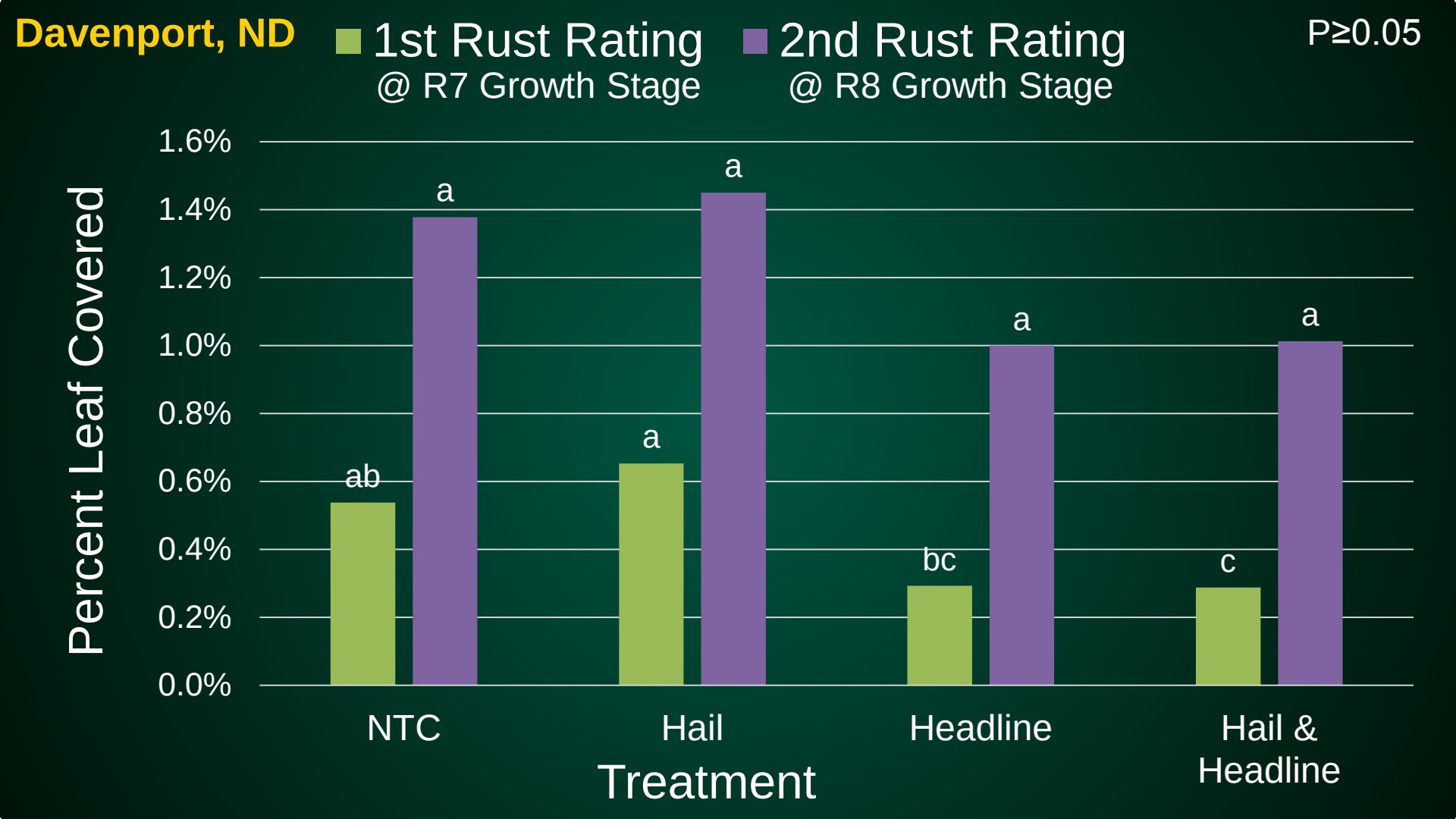
- Three locations
- RCBD with four reps
- Four treatments
  1. No Headline, No Hail (-,-)
  2. No Headline, With Hail (-,+)
  3. With Headline, No Hail (+,-)
  4. With Headline, With Hail (+,+)
- Simulated hail application made at R1 growth stage
- Headline (pyraclostrobin) application made 1-2 days after hail (6fl oz/ac in 20 gal/ac)

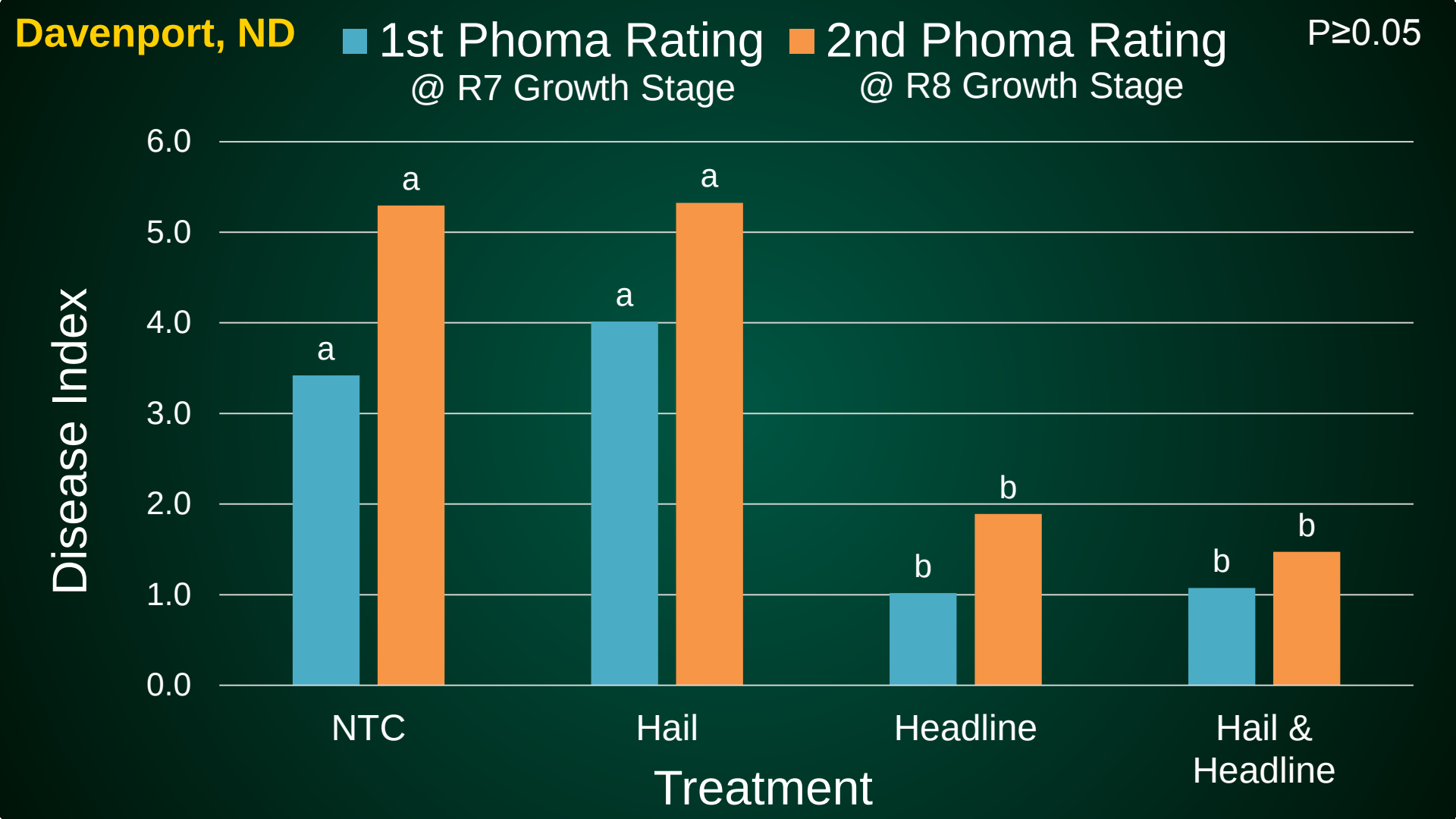
STIHL
STIHL

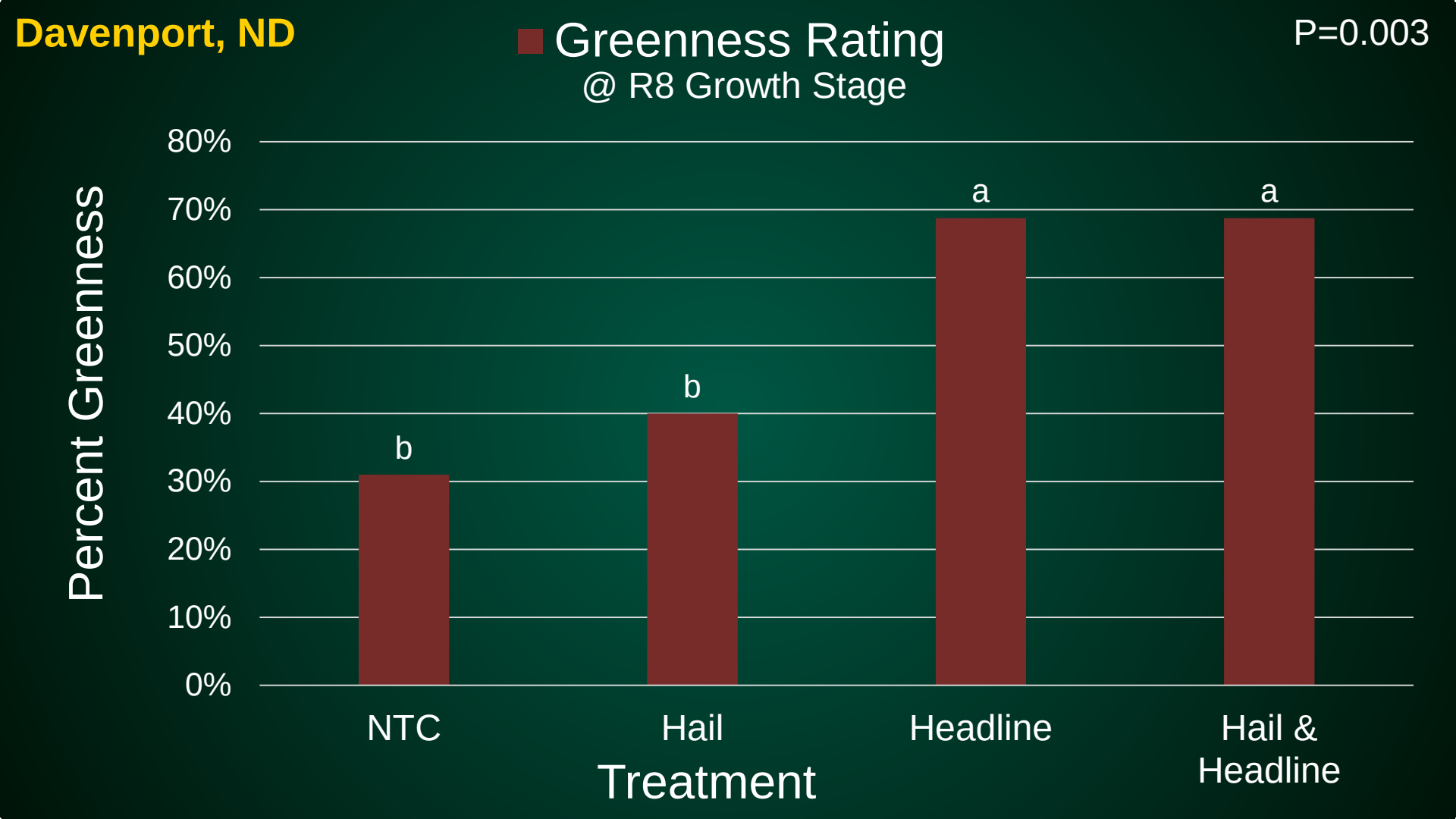
STIHL


+7 Days
+15 Days


Davenport, ND
Leaf Damage @ R1 Growth Stage
Stem Damage @ R1 Growth Stage
P≥0.05
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
Percent Damage
b
b
a
a
b
b
a
a
NTC
Hail
Headline
Hail & Headline
Treatment


Davenport, ND
1st Rust Rating
@ R7 Growth Stage
2nd Rust Rating
@ R8 Growth Stage
P≥0.05
Percent Leaf Covered
1.6%
1.4%
1.2%
1.0%
0.8%
0.6%
0.4%
0.2%
0.0%
ab
a
a
a
bc
a
c
a
NTC
Hail
Headline
Hail & Headline
Treatment


Davenport, ND
1st Phoma Rating @ R7 Growth Stage
2nd Phoma Rating @ R8 Growth Stage
P≥0.05
Disease Index
6.0
5.0
4.0
3.0
2.0
1.0
0.0
a
a
a
a
b
b
b
b
NTC
Hail
Headline
Hail & Headline
Treatment


Davenport, ND
Greenness Rating
@ R8 Growth Stage
P=0.003
Percent Greenness
80%
70%
60%
50%
40%
30%
20%
10%
0%
b
b
a
a
NTC
Hail
Headline
Hail & Headline
Treatment

Davenport, ND

NTC

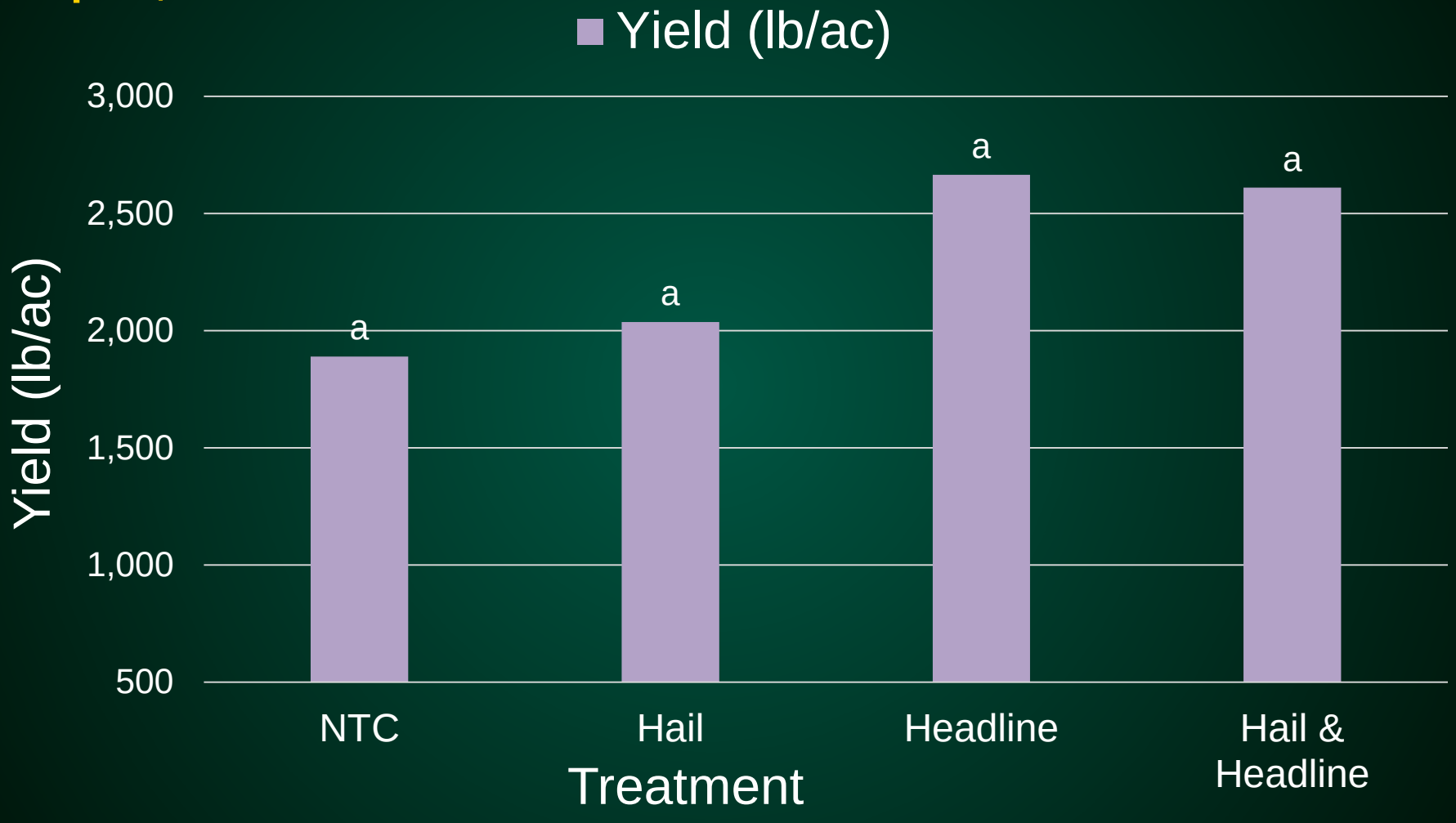
Hail

Headline

Hail + Headline

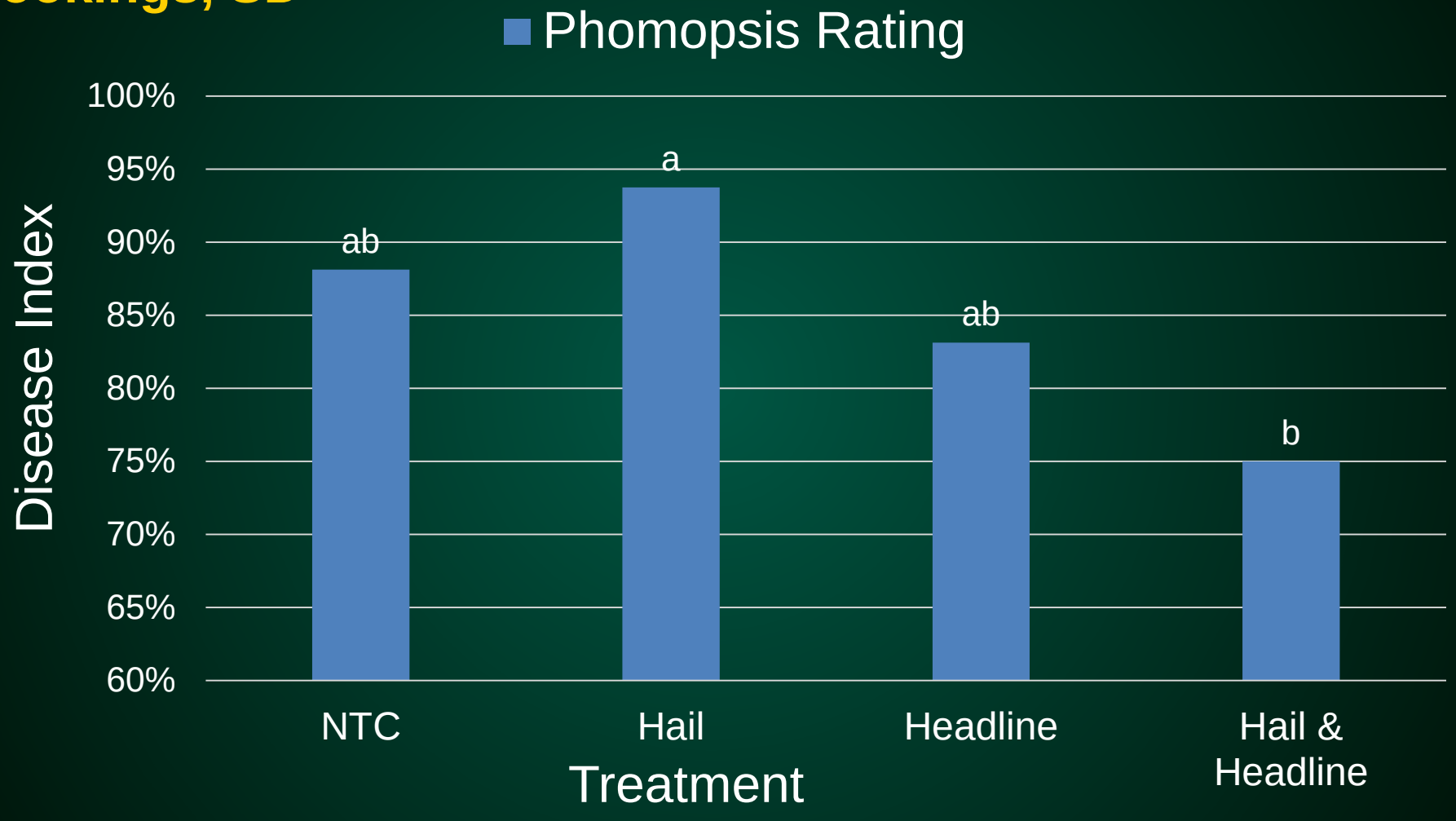
Davenport, ND

P=0.25



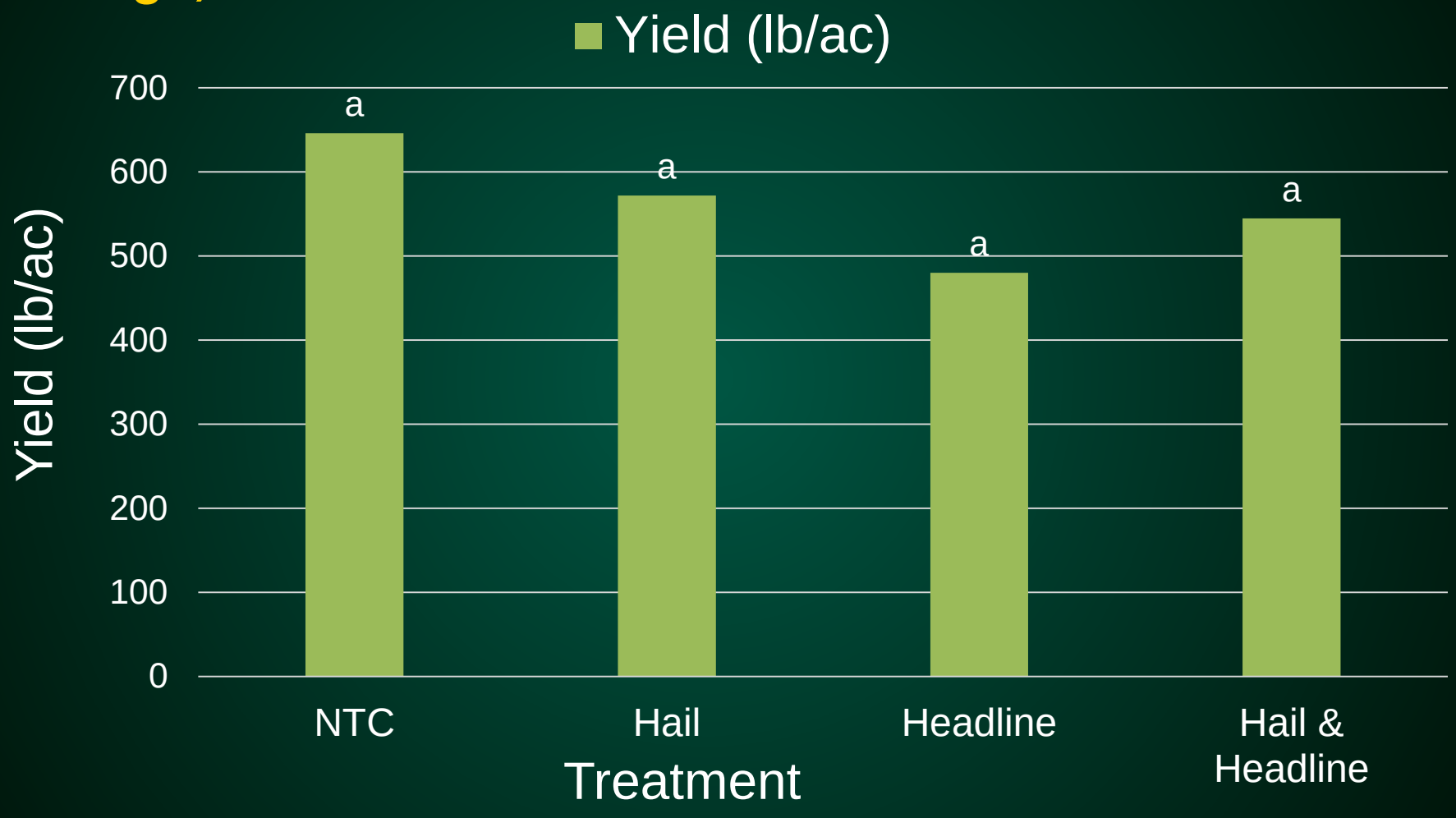
Brookings, SD

P=0.06



Brookings, SD

P=0.51



Conclusion

- Hail had no effect on disease
- R1 application of Headline improved sunflower health in terms of Phoma, Rust, and greenness(?)
- No yield effects from hail damage ($\alpha=0.05$)
- No yield effects from Headline ($\alpha=0.05$)
- Yield conclusions are inconclusive

Thank You

- UNL – Panhandle Res. & Ext. Center
- NDSU - Extension
- SDSU
- BASF
- NSA