

Improving corn yields and NUE with late N applications using high clearance equipment

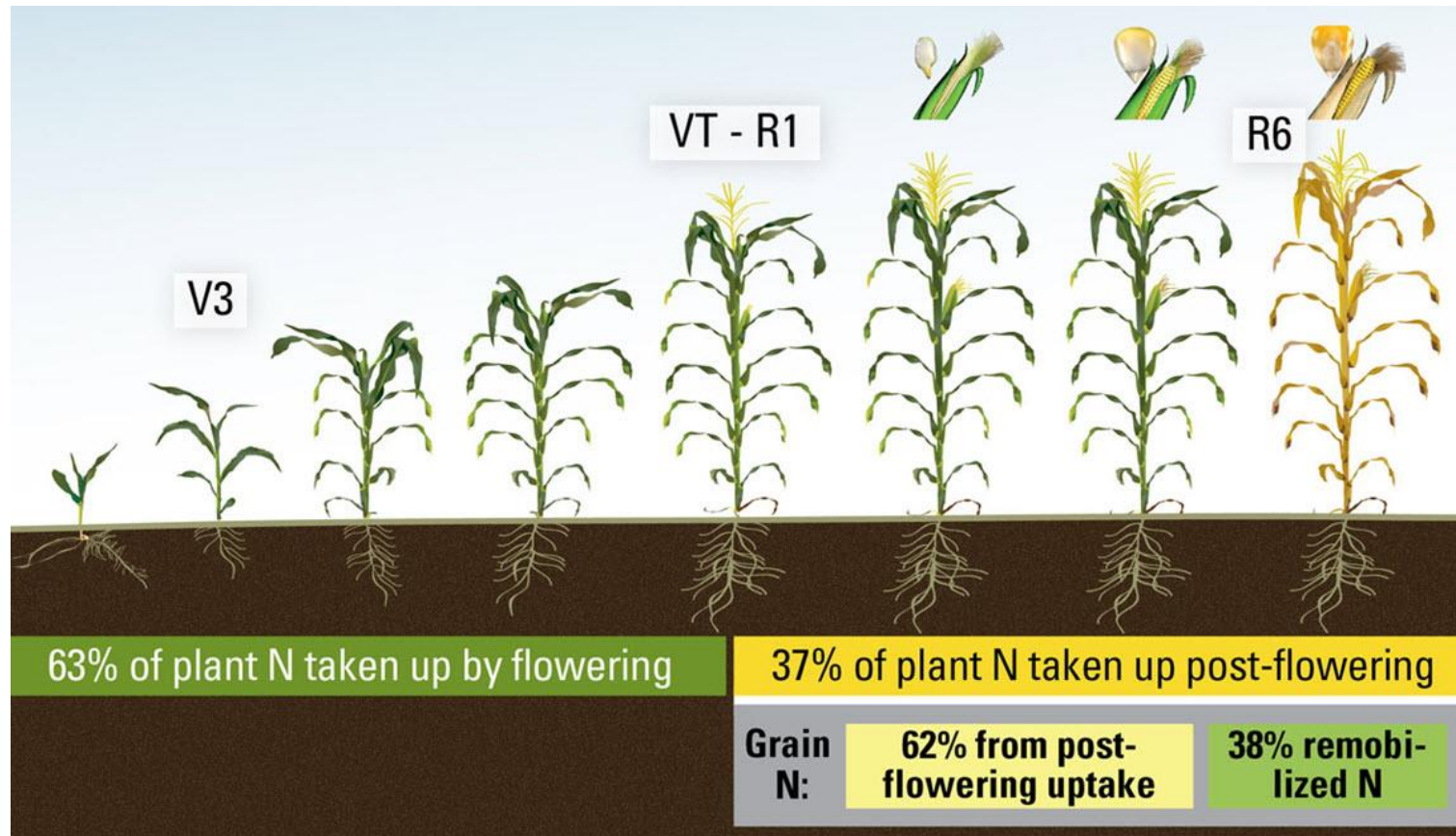
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Background

- Previous studies showed significant amount of N uptake post-flowering.



Objectives

- Assess the value of split N application with post-flowering application and emphasis on yield and NUE.
- Evaluate foliar N application using N sources with urea-formaldehyde/triazone with post-flowering application.
- Evaluate the benefit of fungicide applications on yield and NUE with late N applications.



Treatments

Treatments	Description
1	0 lbs N/acre (Control)
2	160 lbs N/acre at planting
3	200 lbs N/acre at planting
4	120 + 40 at tasseling
5	160 + 40 at tasseling
6	120 + 40 at tasseling + foliar N at tasseling
7	160 + 40 at tasseling + foliar N at tasseling

Treatments included with and without fungicide-
total of 14 treatments.

Materials and Methods

- 3 locations in 2016:
 - Neosho: rain feed
 - Rossville: irrigated
 - Scandia: irrigated
- 4 replications.
- Foliar N applied at 4.5 lbs N/acre (Triazone).
- Fungicide: Headline (pyraclostrobin).



Materials and Methods

<u>N rates:</u> <ul style="list-style-type: none">• 0• 160• 200	<u>N placement/time:</u> <ul style="list-style-type: none">• Pre-plant• Split• Split + Foliar N	<u>Fungicide:</u> <ul style="list-style-type: none">• Yes• No
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Materials and Methods

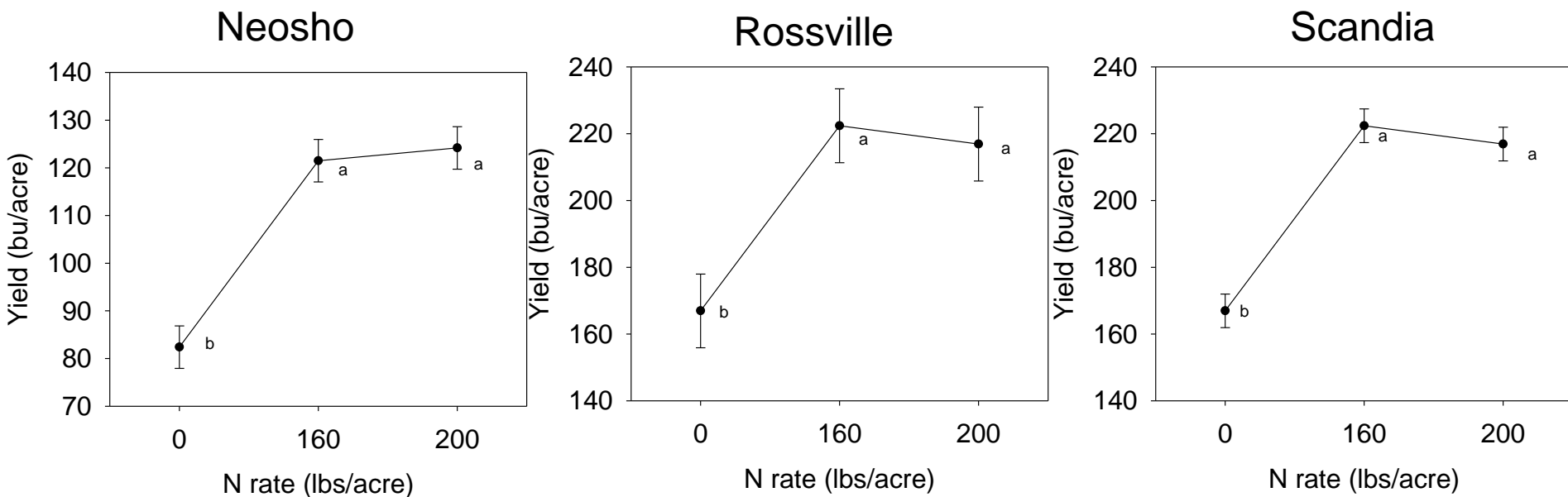


76 in clearance

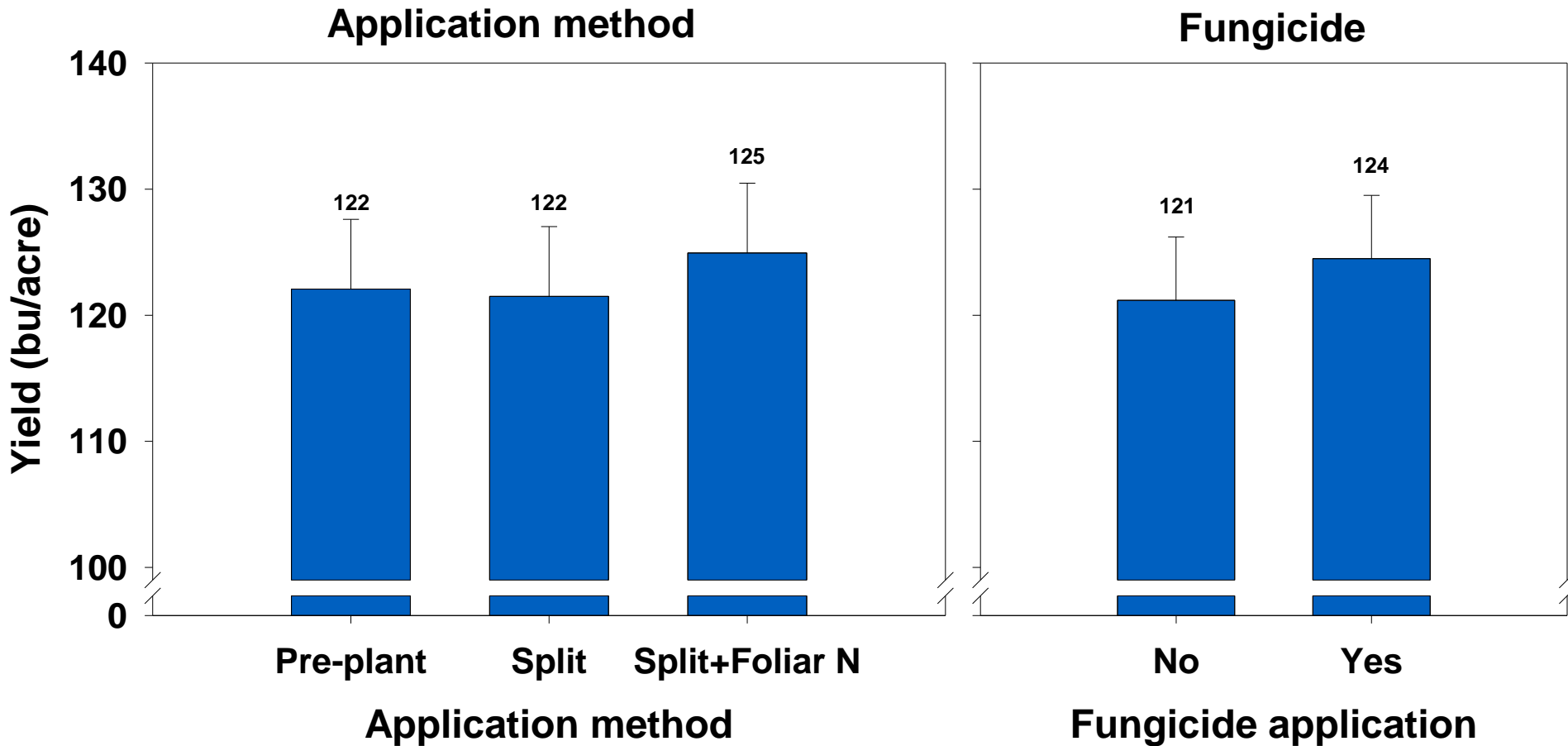
Materials and Methods



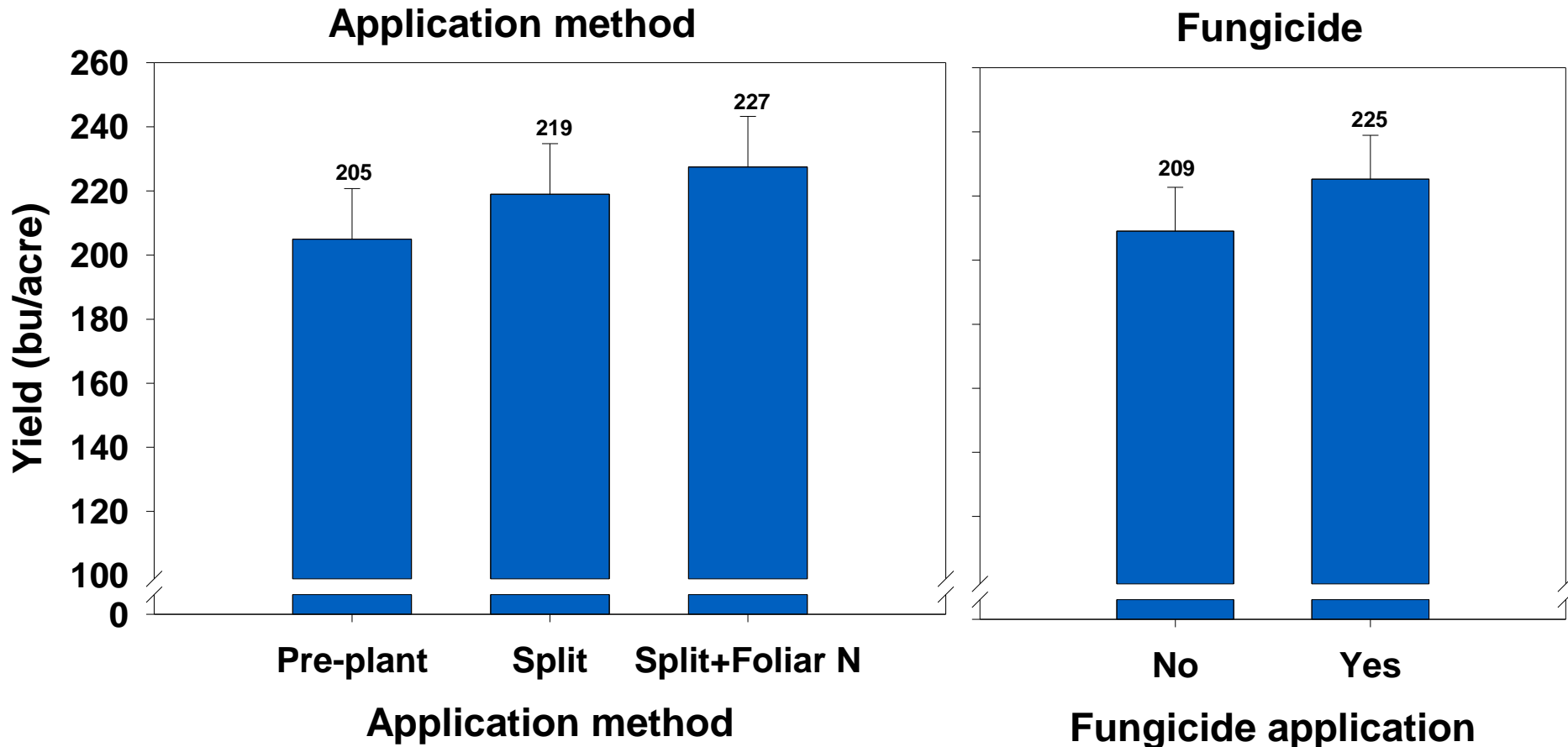
Corn yield response to the main effect of N rate



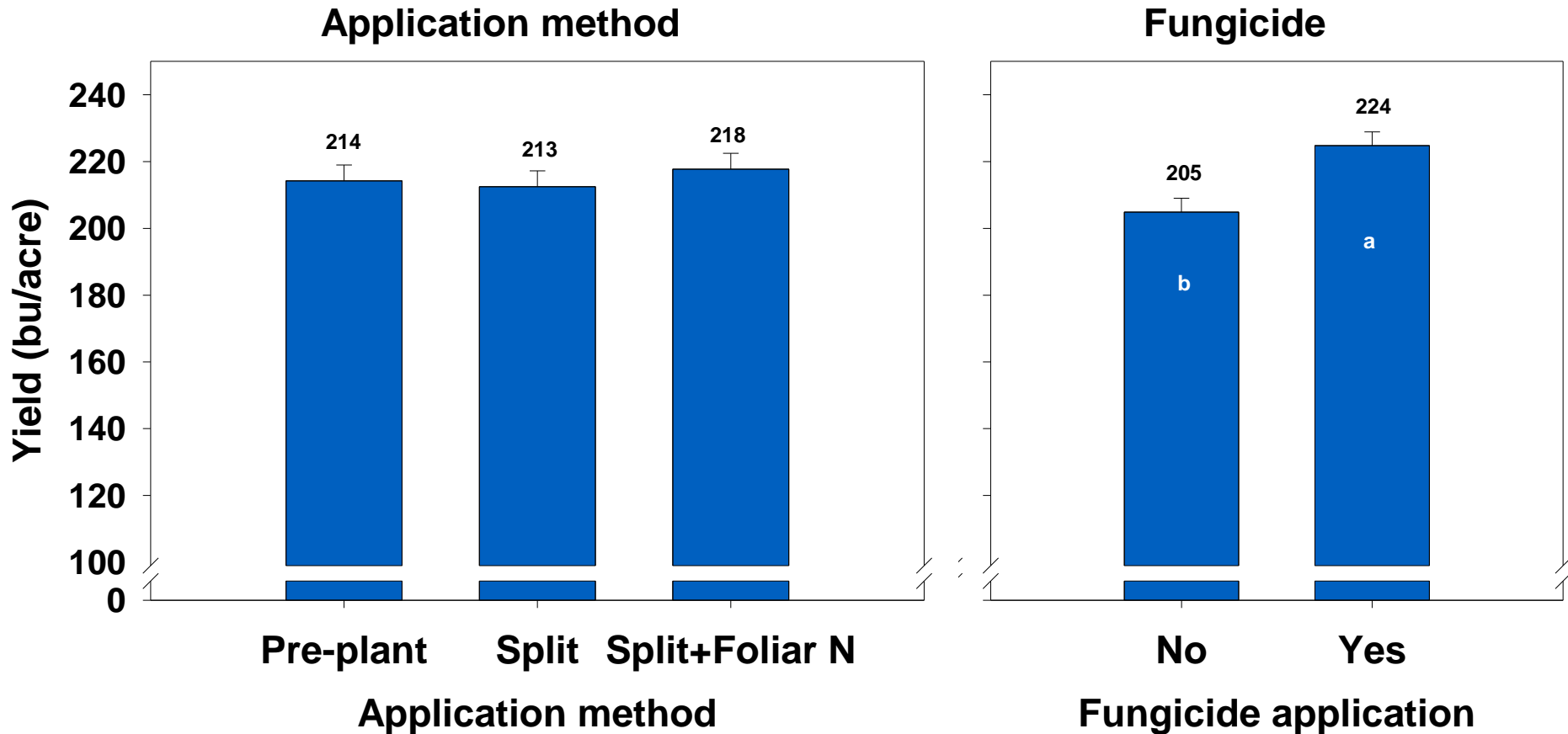
Main effect of N application method and fungicide – Neosho



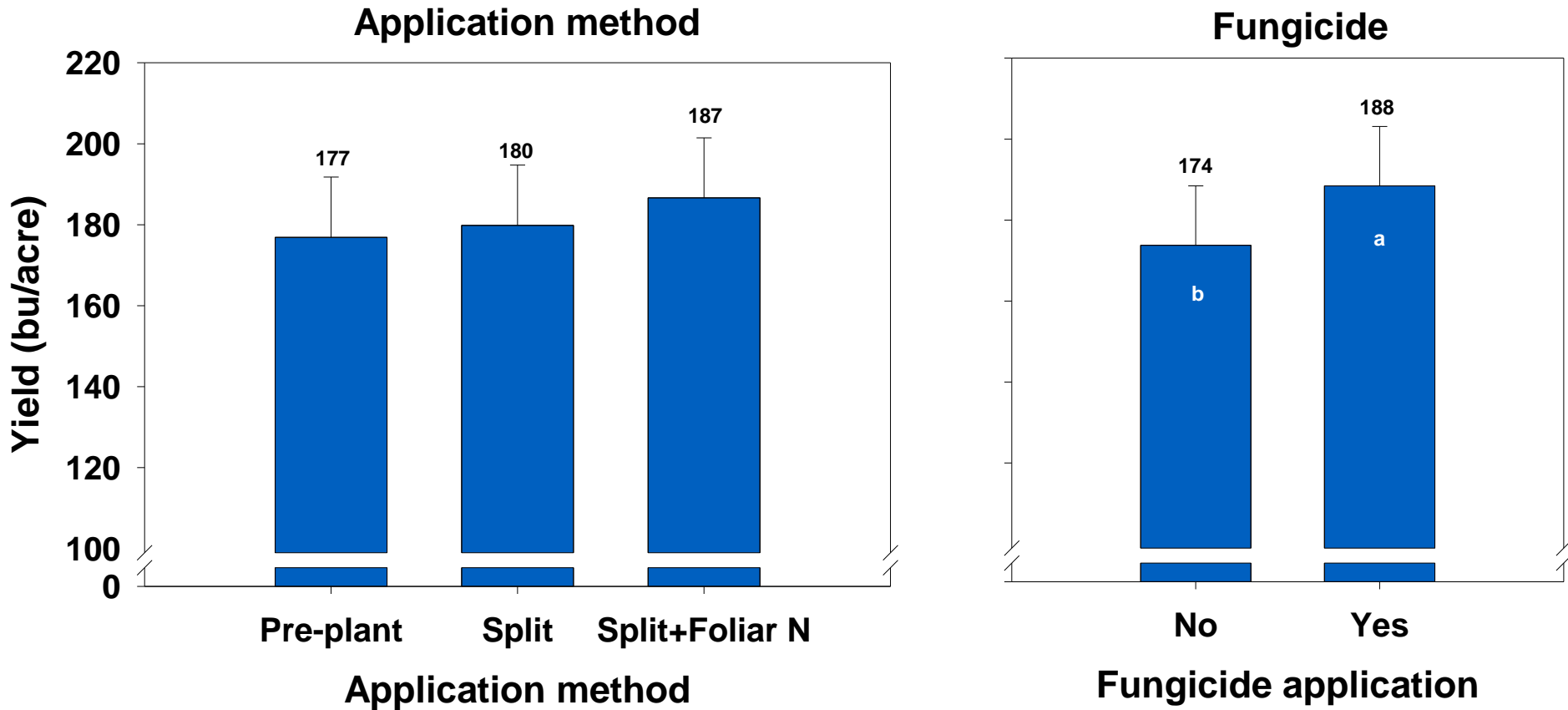
Main effect of N application method and fungicide – Rossville



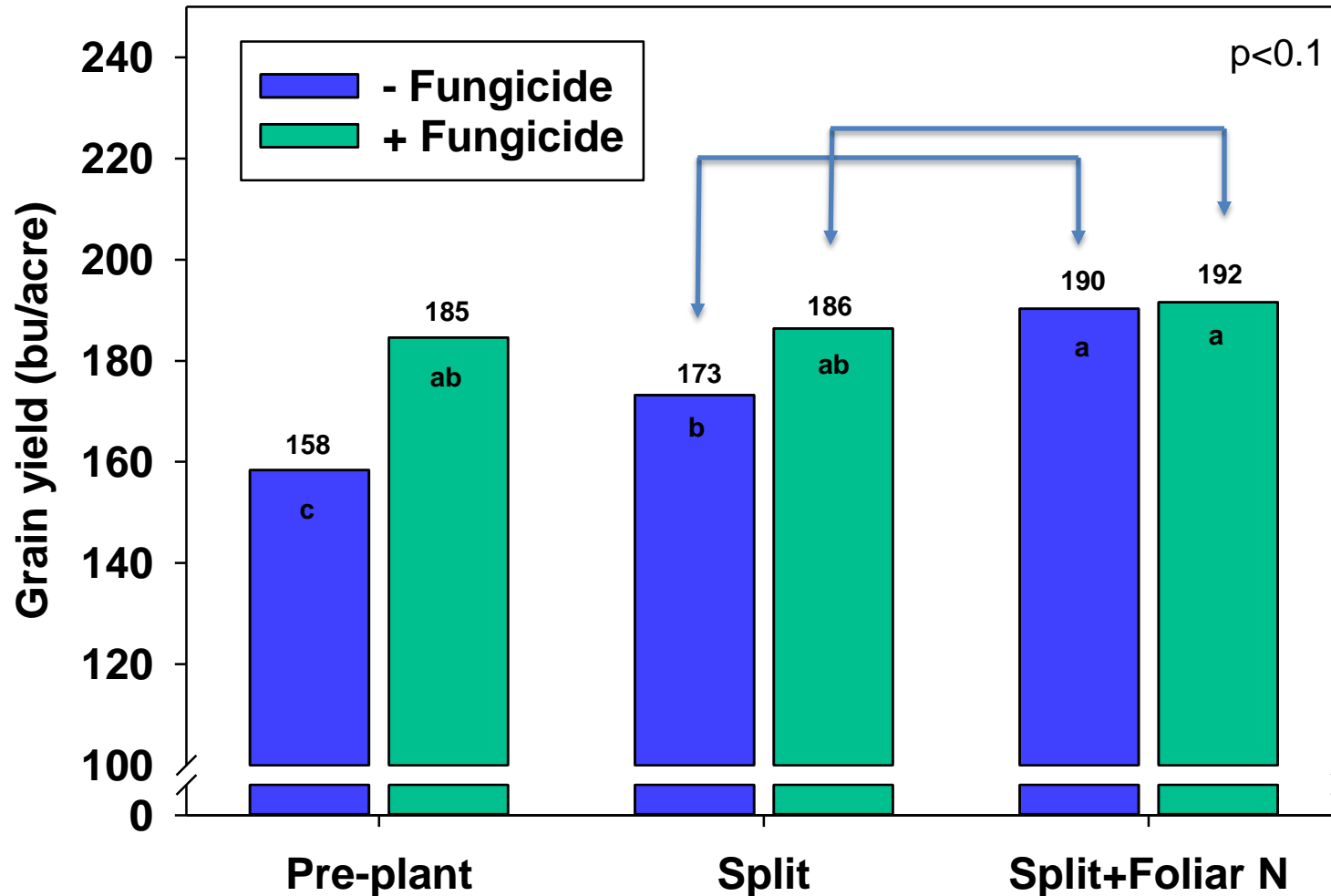
Main effect of N application method and fungicide – Scandia



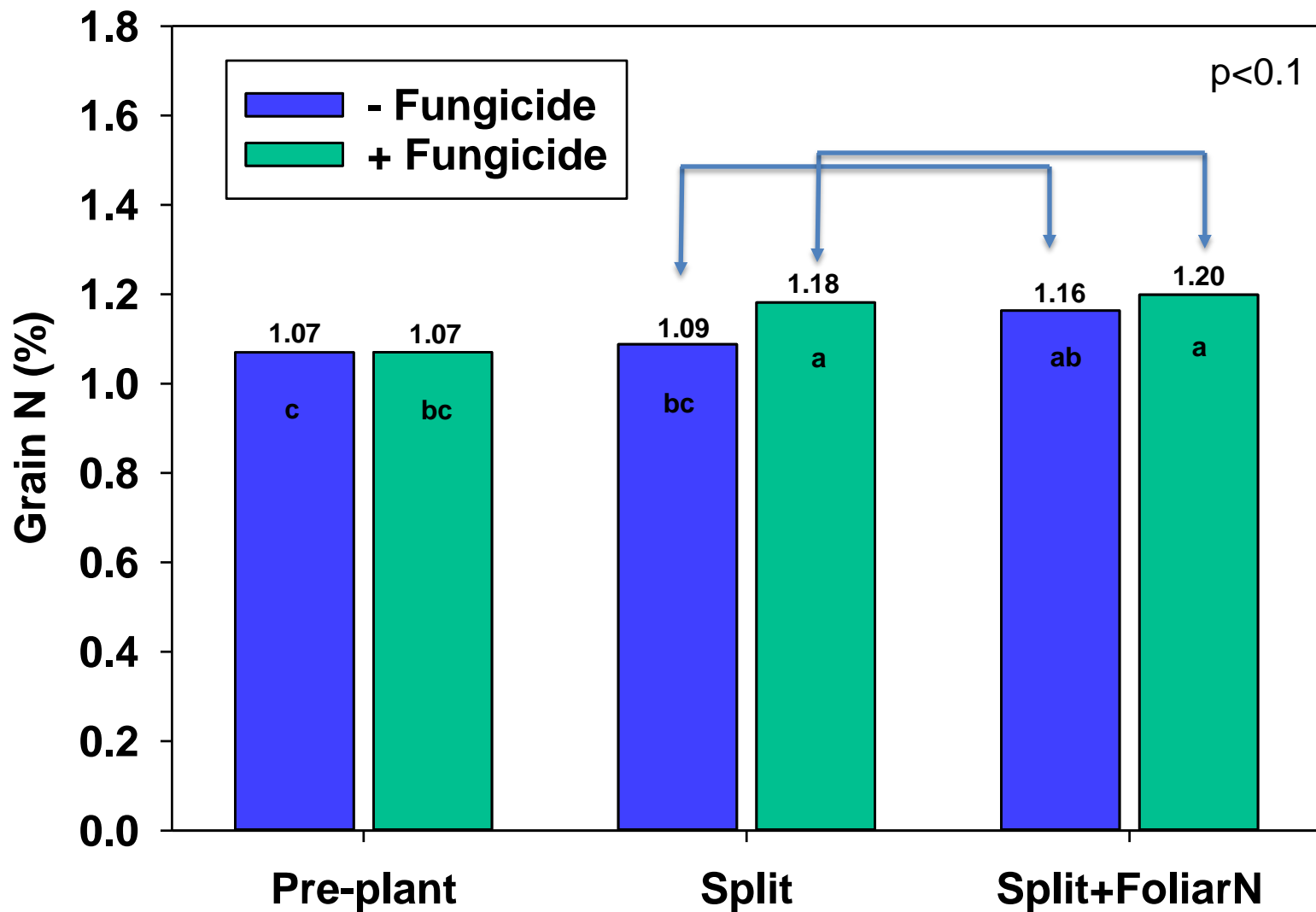
Main effect of N application method and fungicide – All locations



Foliar N and fungicide application with the 200 lbs N/a rate across locations



Foliar N and fungicide application with the 200 lbs N/a rate across locations



Additional measurements

- Total plant N uptake.
- Nitrogen Use Efficiency (lb/lb)
 - Grain weight / N supplied.
- Utilization Efficiency (lb/lb)
 - Grain weight / Total N in plant.
- Uptake Efficiency (%)
 - (Total N in plant / N supplied) x 100.
- Nitrogen Recovery (%)
 - [N uptake (fertilized plot) – N uptake (0-N plot)] / [N applied] × 100.
- Nitrogen Harvest Index (%)
 - (Grain N content / N total in plant) x 100.



Summary – Year 1

- Preliminary results showed soil-applied N post-flowering can provide N for corn uptake.
- Consistent response to fungicide application for all locations in 2016.
- Triazone-based foliar N showed positive results in 2016 (minimalized when fungicides are used).



Summary – Year 1

- High yielding irrigated as well as rain-feed conditions may benefit from late N application.
- N movement to the root zone for uptake can be a limitation under dryland?
- Evaluation of nitrogen use efficiency under different management systems.



Thank you! Questions?

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