

Comparison of the DJI Agras T40 UAV and Airplane for the Application of Fungicides in Corn



Mizzou
weed
science

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Introduction

- **Fungicide applications must be timely and provide uniform coverage**
- **Unmanned aerial vehicles (UAVs) may have the potential to provide a more timely option for fungicide application**
- **Few studies have been conducted comparing airplane and UAVs for application of fungicides in a large field setting**



Objectives

Evaluate disease severity, spray coverage, and yield following a fungicide application from a plane vs. DJI Agras T40 UAV (@ 2 and 4 GPA)



Materials and Methods

Three locations:

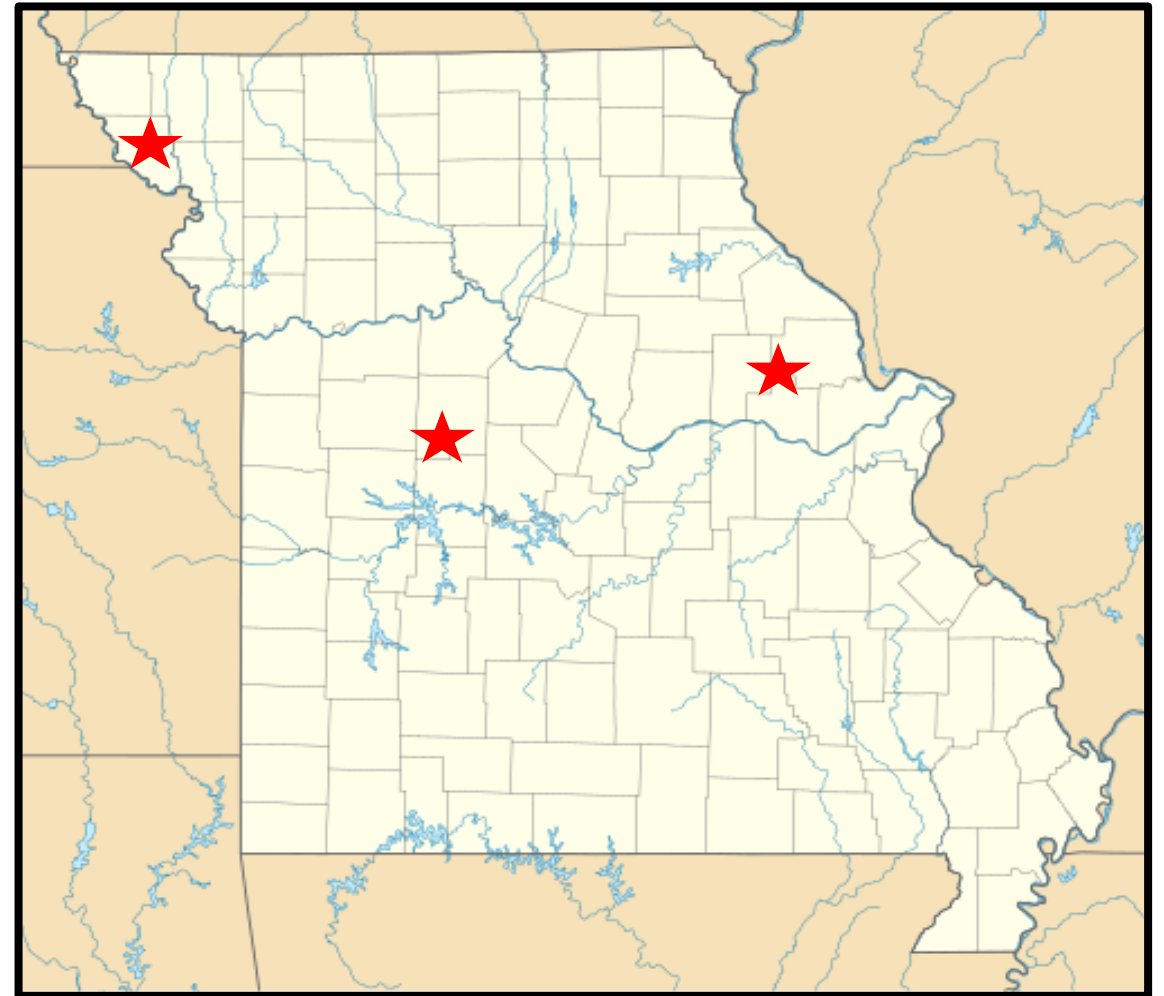
- Green Ridge
- Mound City
- Truxton

Two years of data at each location

Individual plots:

- 60' or 90' wide
- 1,320 – 2,640 ft long

4 replications of each treatment at each location



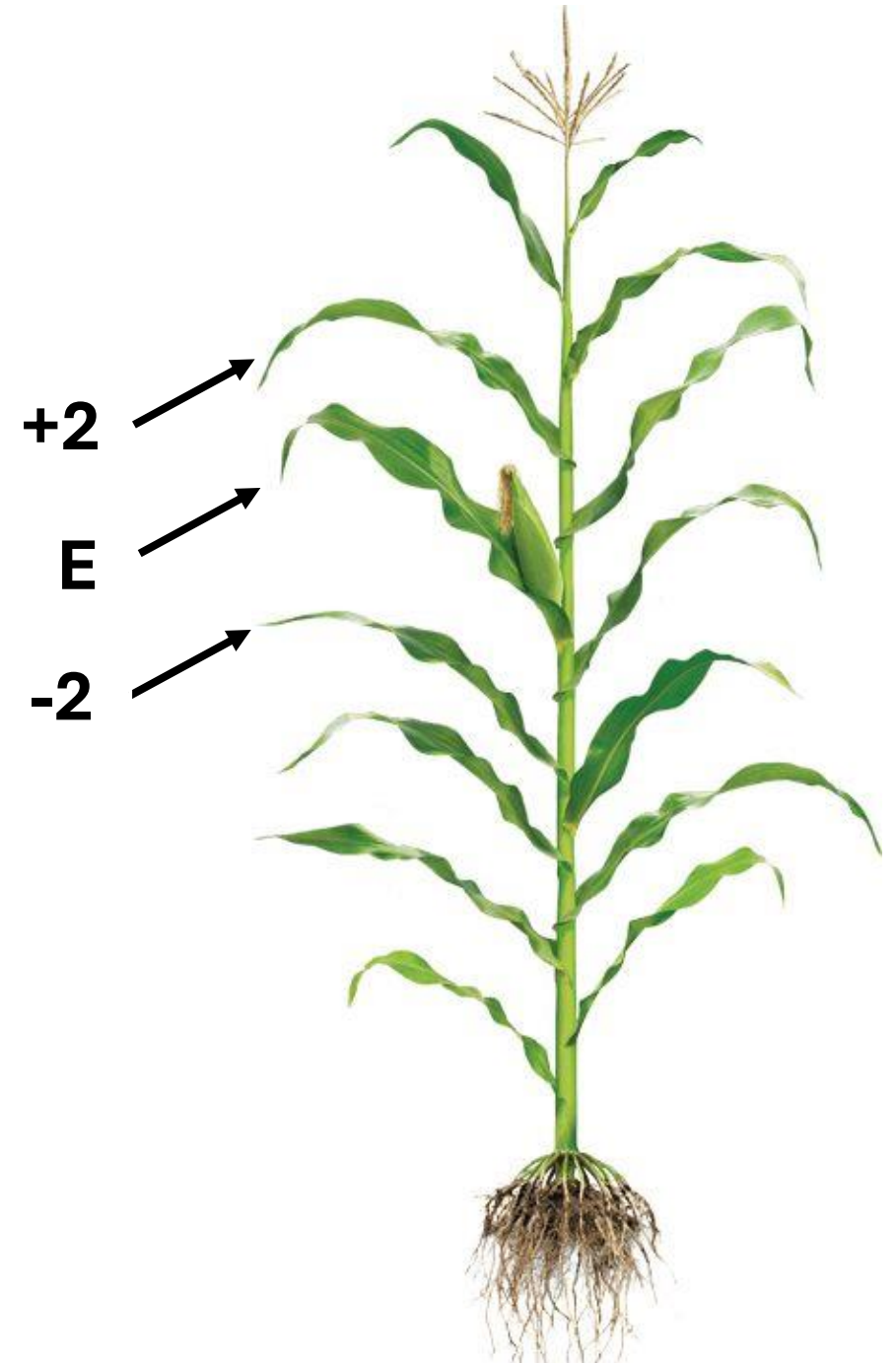
Materials and Methods

- **Cooperator selected products, rate, and timing**
- **The same fungicide treatment and additives were sprayed by the UAV (DJI Agras T40) and airplane at each location**
- **Treatments were sprayed by the UAV at 2 and 4 GPA**
- **Plane sprayed at 2 GPA; model varied by location**

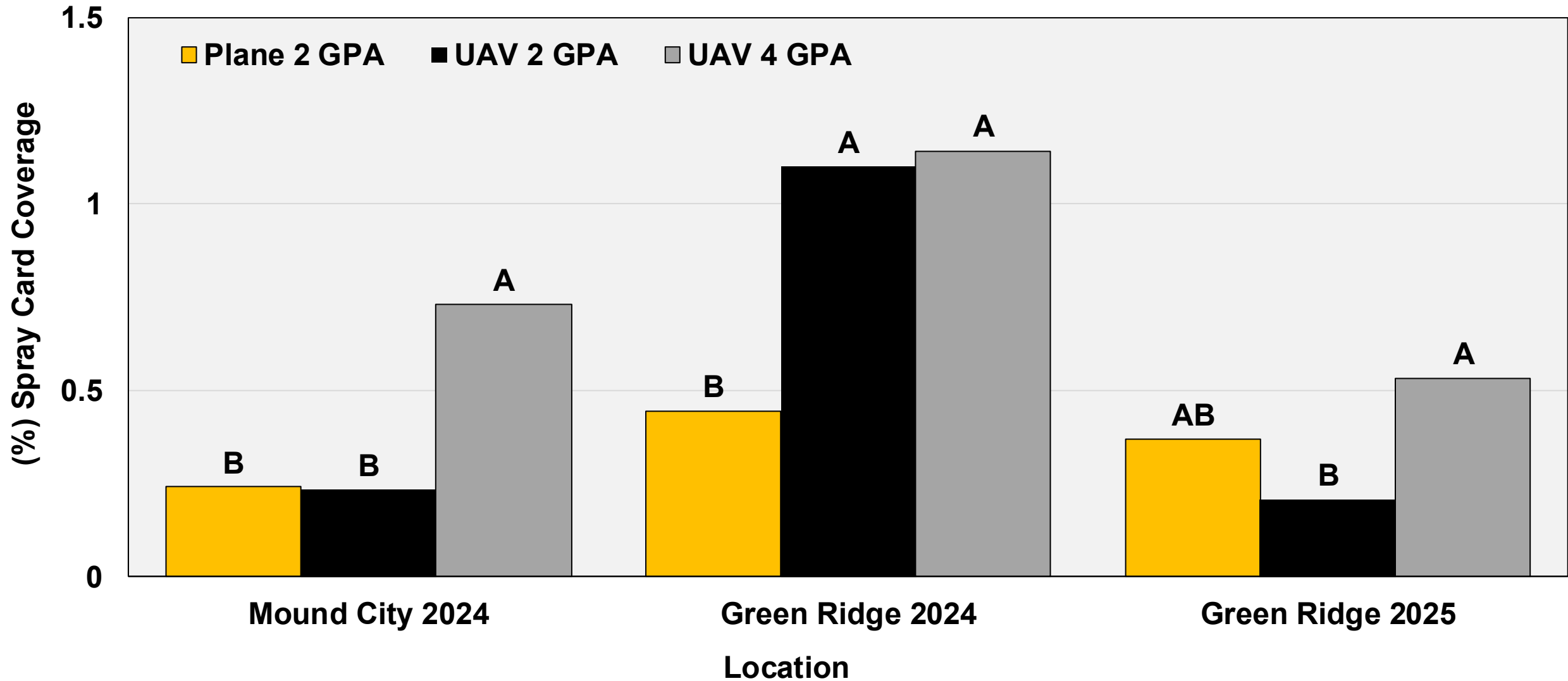


Materials and Methods

- Water sensitive cards placed on top and bottom of ear leaf (E), two leaves above the ear leaf (+2), and two leaves below the ear leaf (-2) at application
- Image J software used to determine percent coverage and droplet size
- Disease severity was evaluated at application, R3, and R6

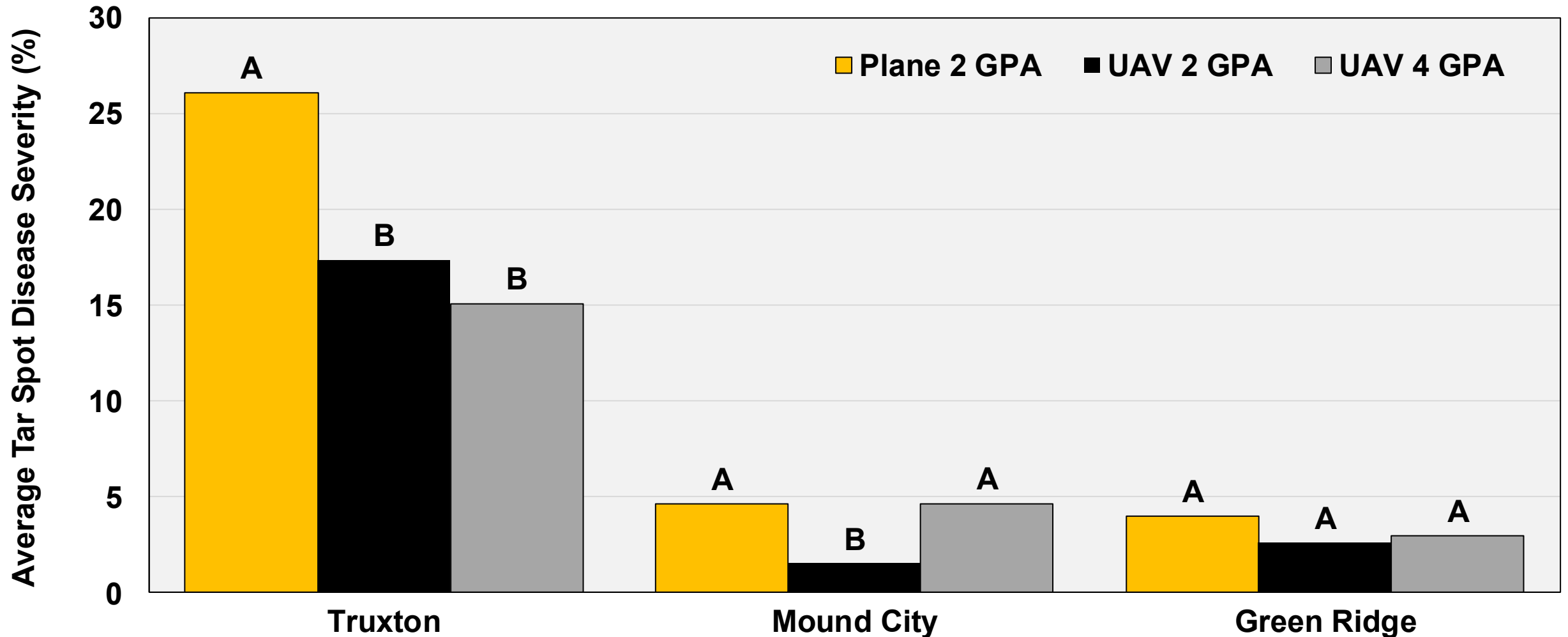


Average Fungicide Spray Coverage Across Top Cards



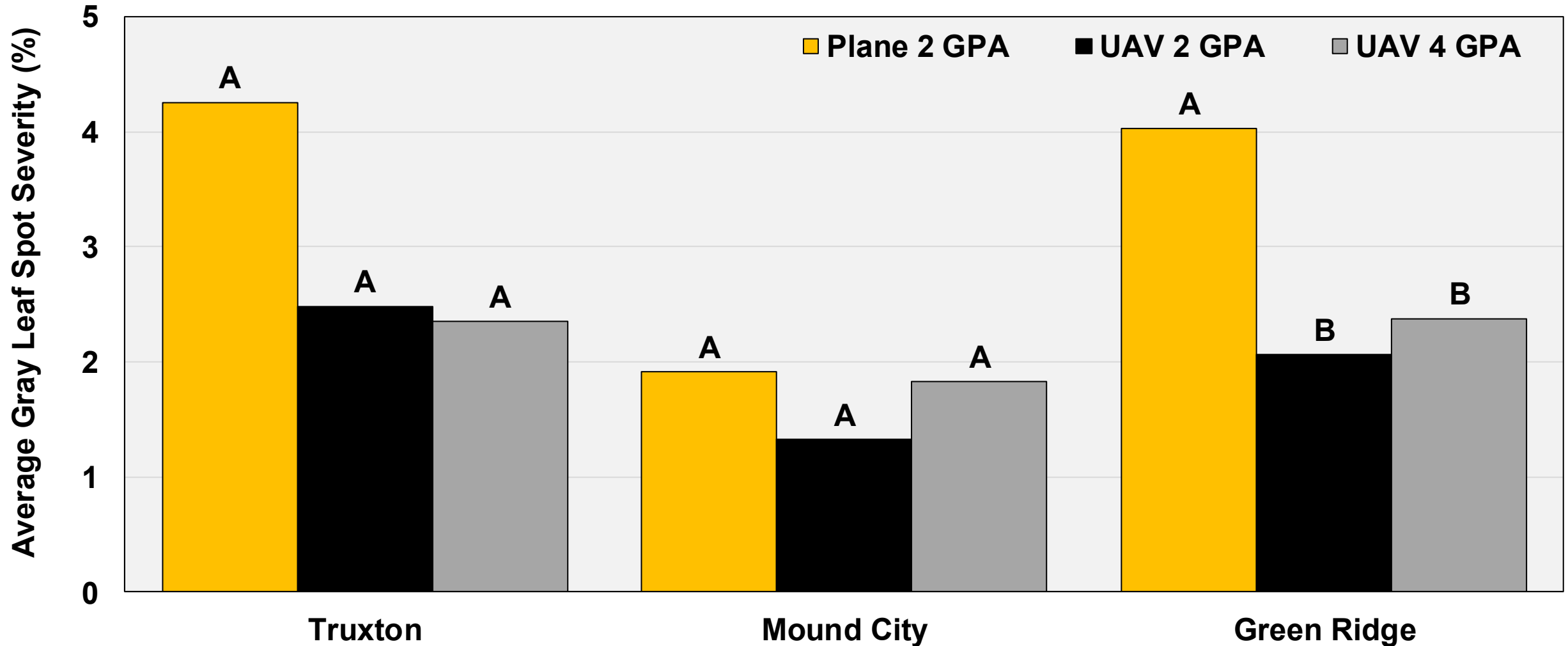
*Bars within a location followed by the same letters are not different, LSD=0.05.

2024 Average Tar Spot Disease Severity at R6



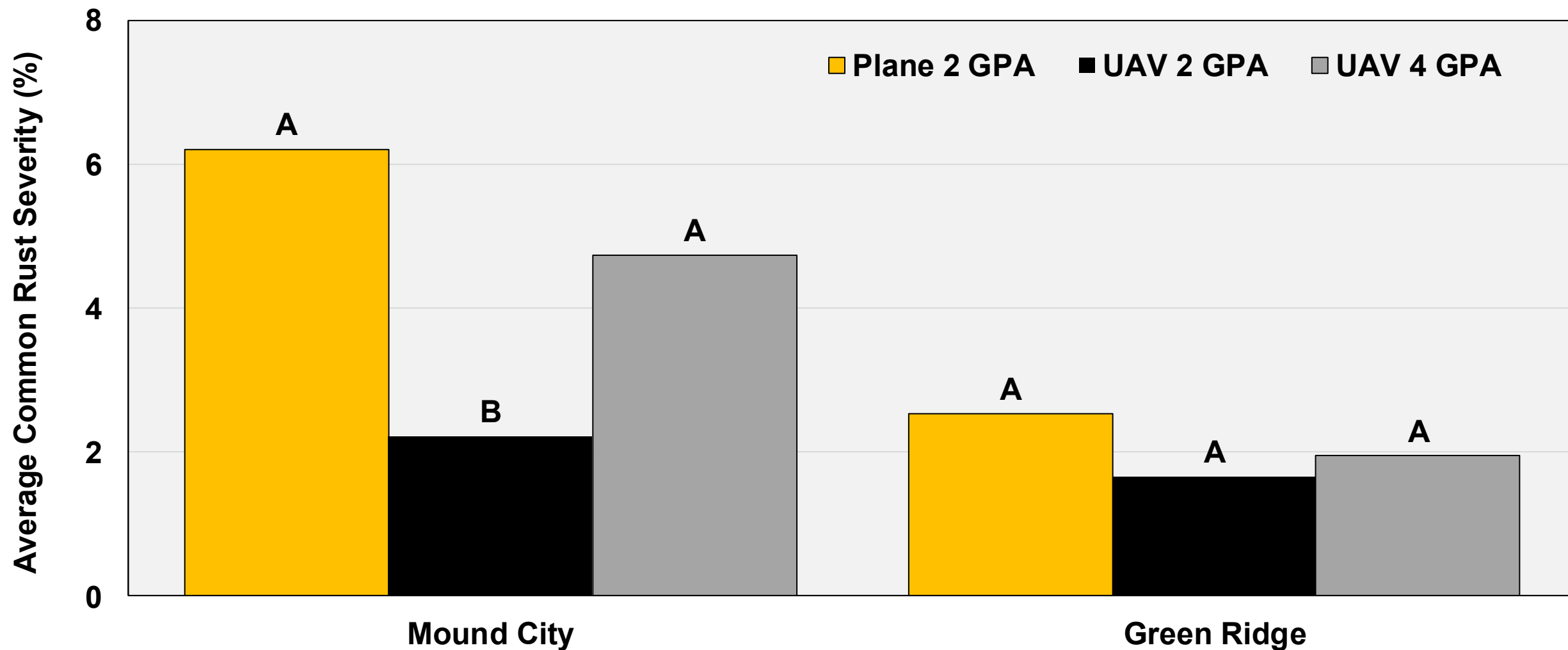
*Bars within a location followed by the same letters are not different, LSD=0.05.

2024 Average Gray Leaf Spot Disease Severity at R6



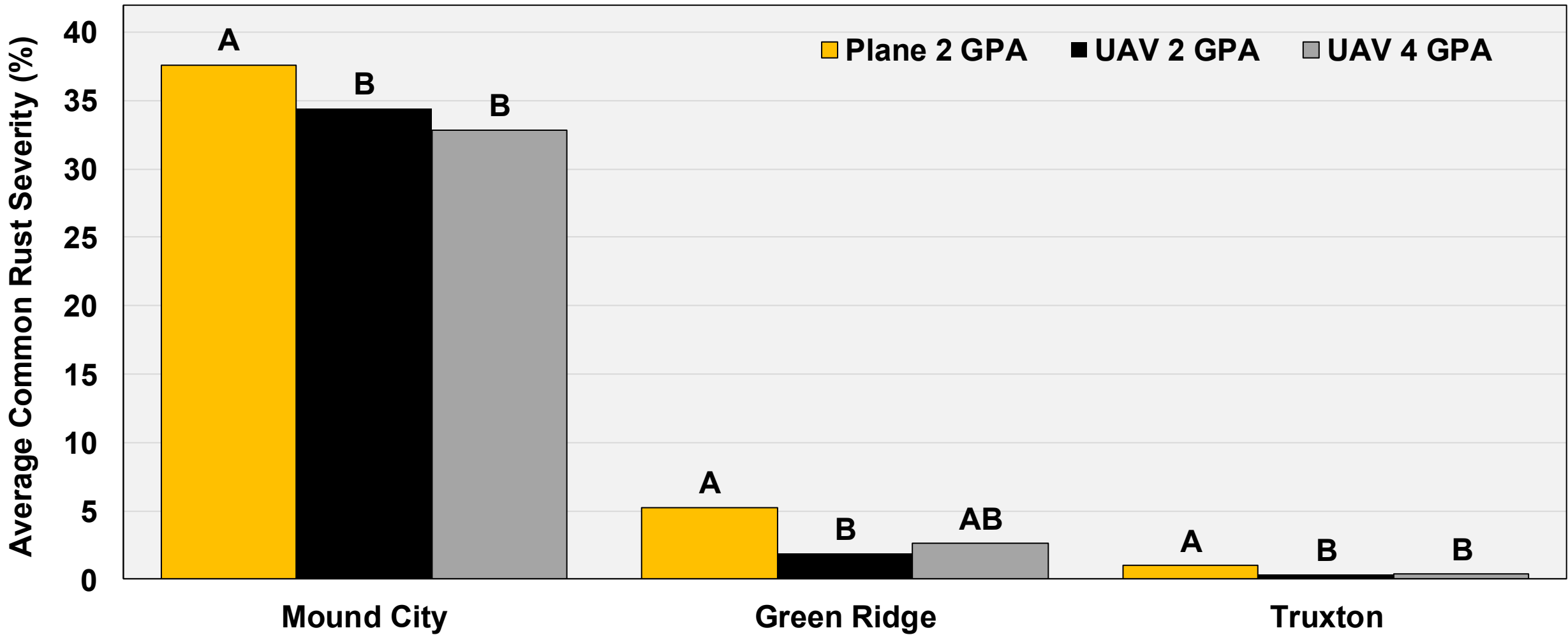
*Bars within a location followed by the same letters are not different, LSD=0.05.

2024 Average Common Rust Disease Severity at R6



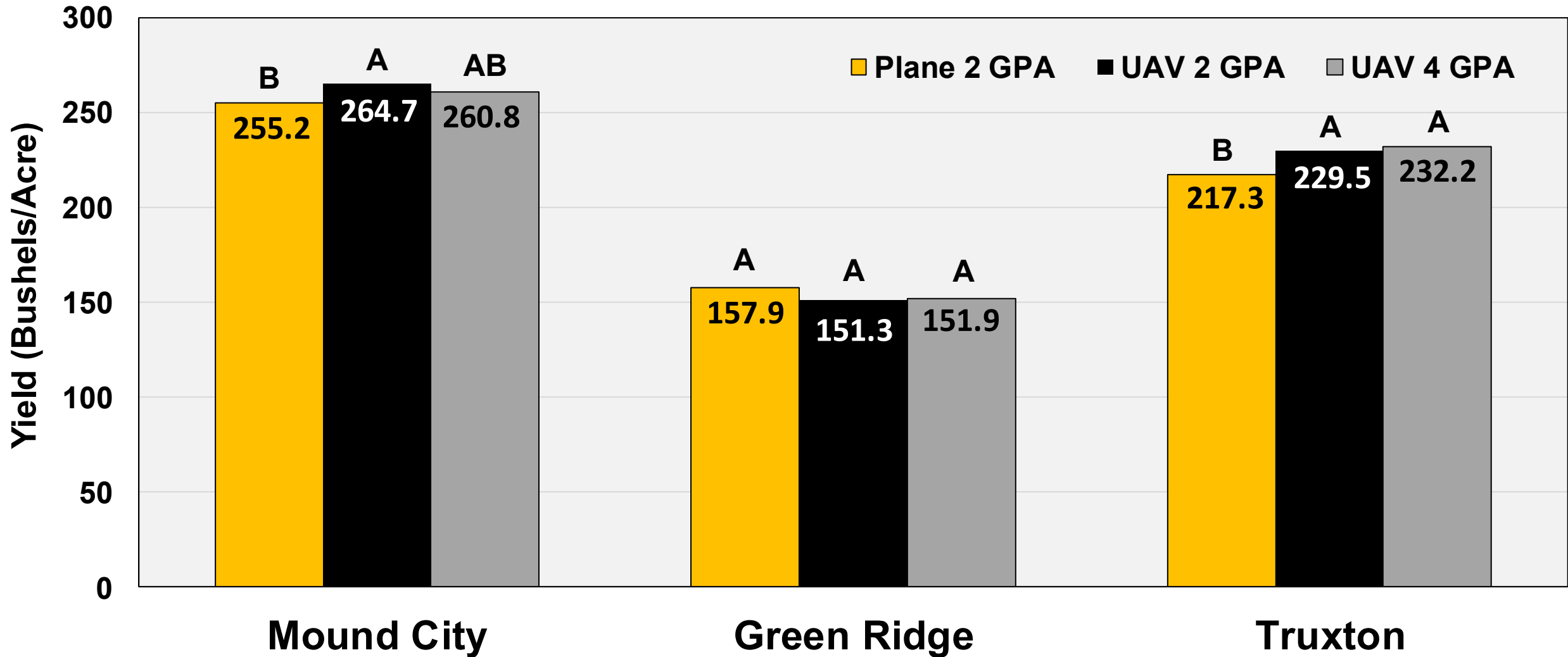
*Bars within a location followed by the same letters are not different, LSD=0.05.

2025 Average Southern Rust Disease Severity at R6



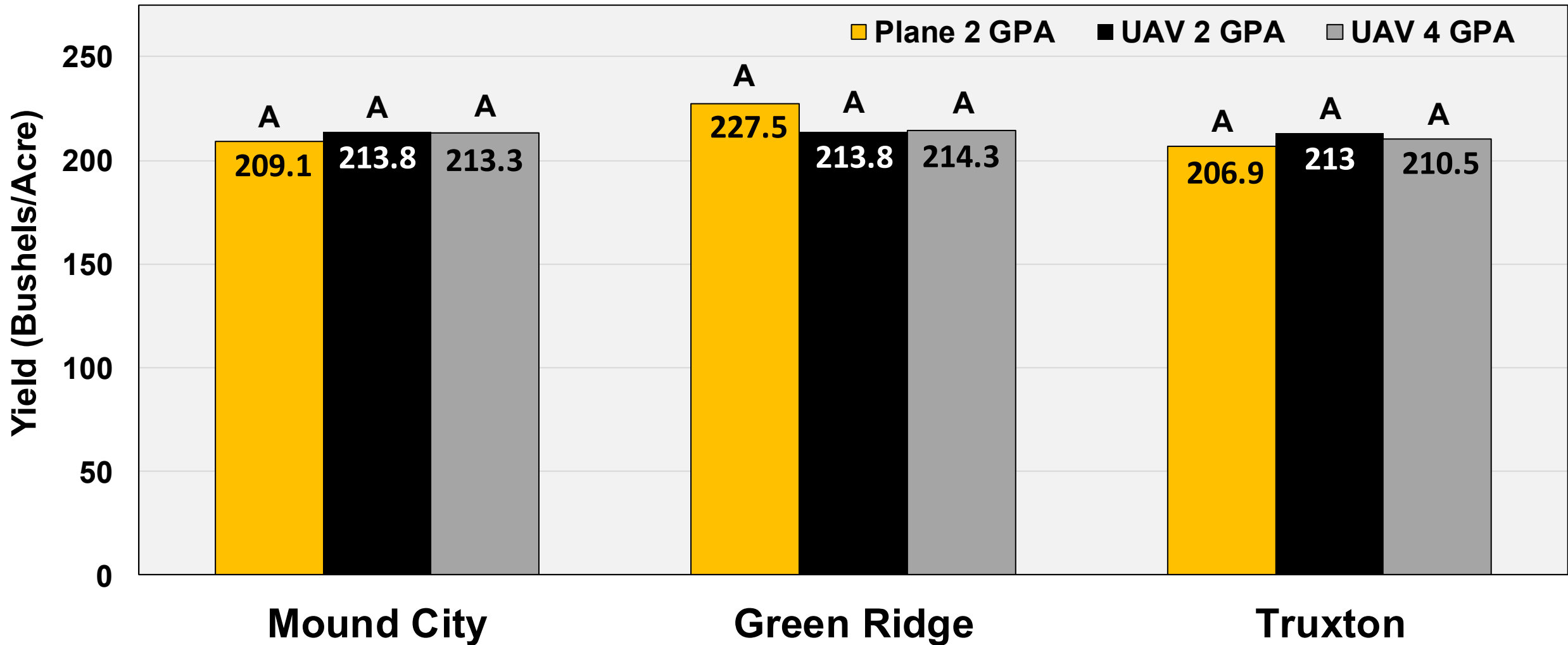
*Bars within a location followed by the same letters are not different, LSD=0.05.

2024 Corn Yield Response to Treatments



*Bars within a location followed by the same letters are not different, LSD=0.1.

2025 Corn Yield Response to Treatments



*Bars within a location followed by the same letters are not different, LSD=0.1.

Conclusions

- UAV applications resulted in similar or lower disease severity by R6 across all locations in both years
- Fungicide application with UAV resulted in equal or higher yields compared to plane applications across all locations in both years



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