

# 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 presence, 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

## 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 model and carrier volume varied by location (2 or 3 GPA)

**Green Ridge → 10.5 ozs Azoxyprop @ VT/R1**

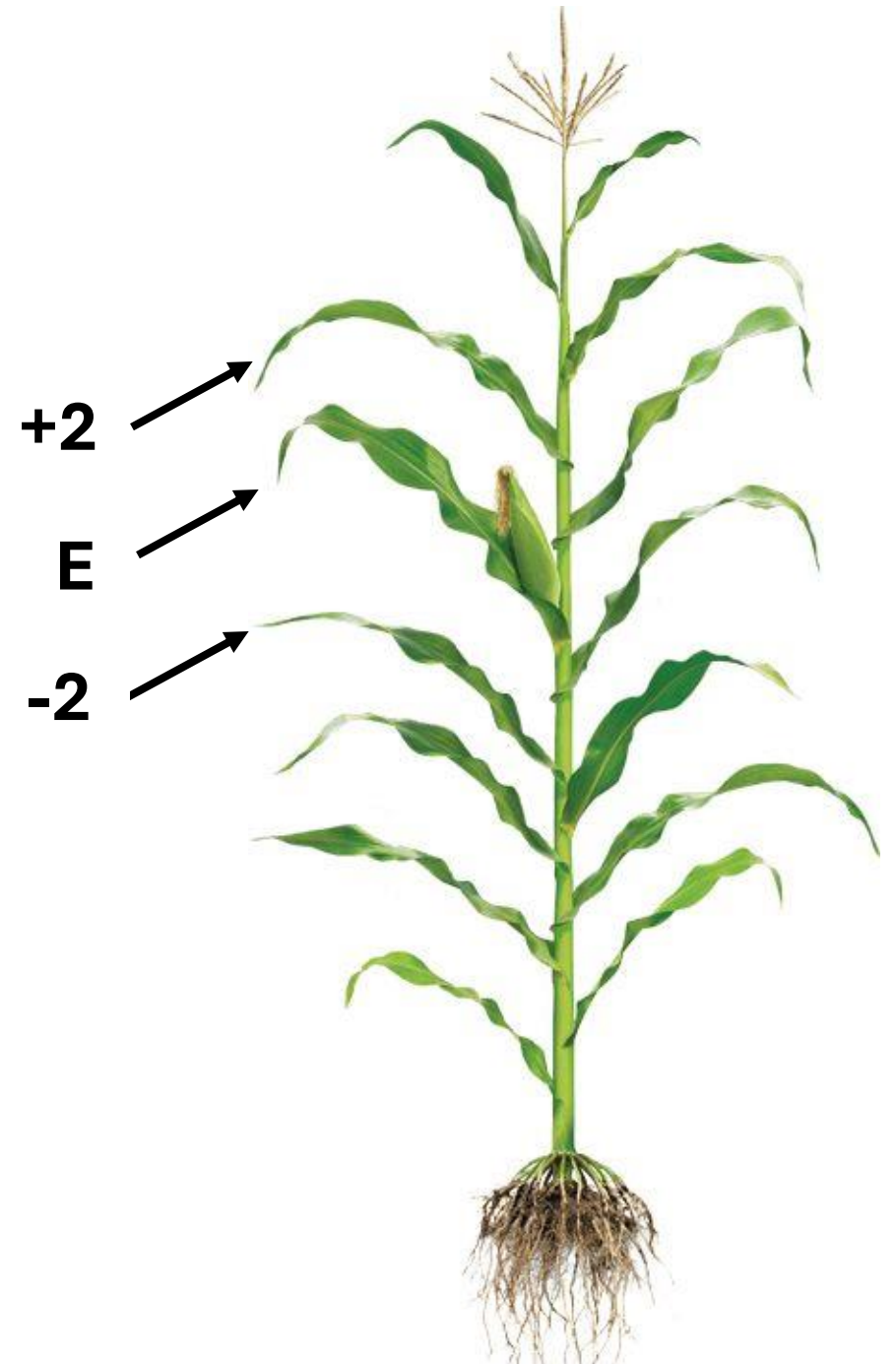
**Mound City → 8 ozs Veltyma + DRA @ R3**

**Truxton → 8 ozs Delaro + 1.5 ozs Grizzly +  
3 ozs AccuDrop @ VT/R1**

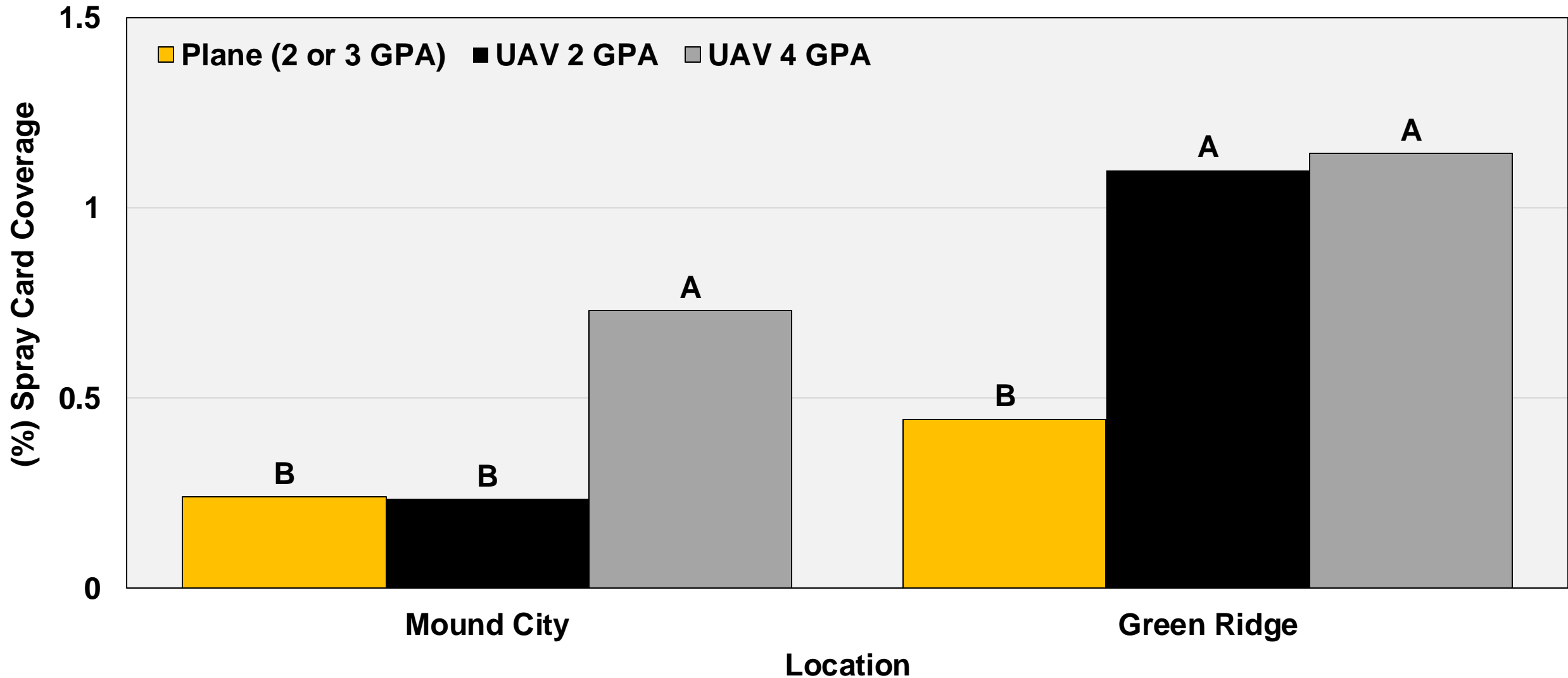


# Materials and Methods

- **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 presence and leaf coverage were determined at application, R3, and R6**

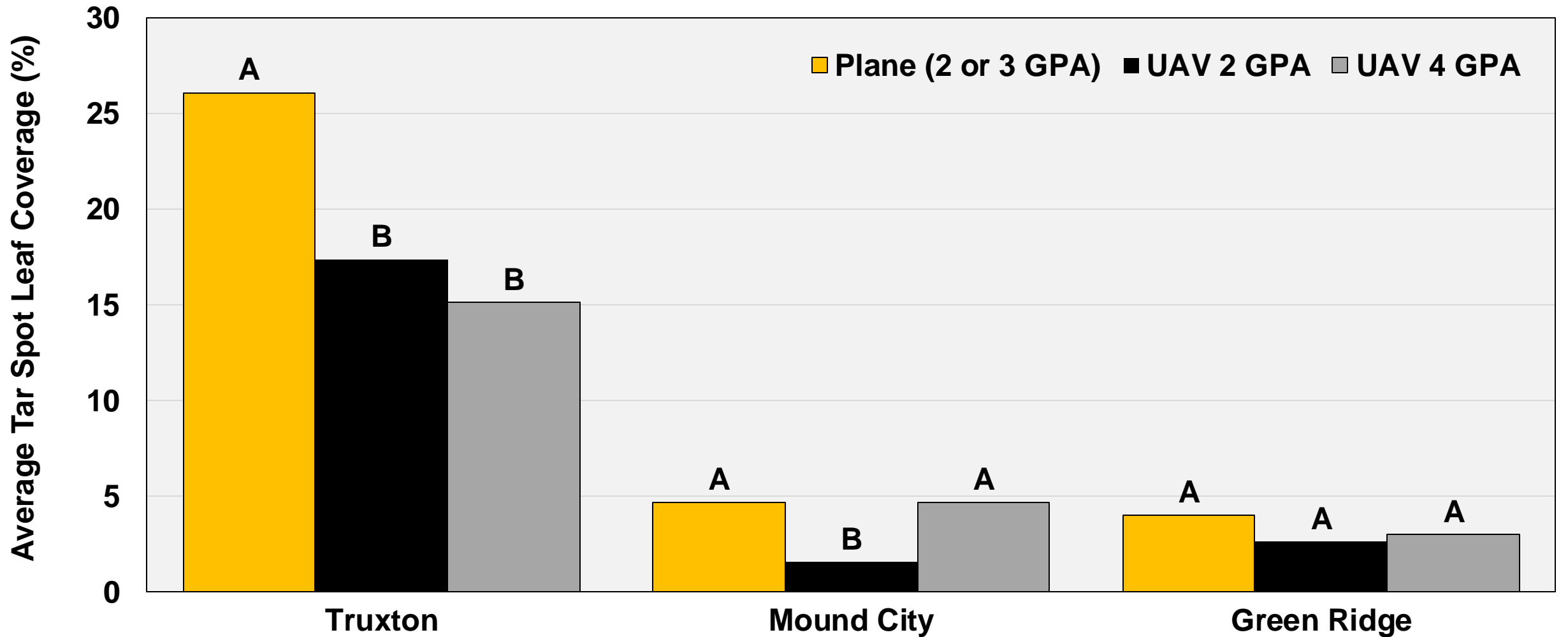


# Fungicide Spray Coverage at the Ear Leaf +2 Position



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

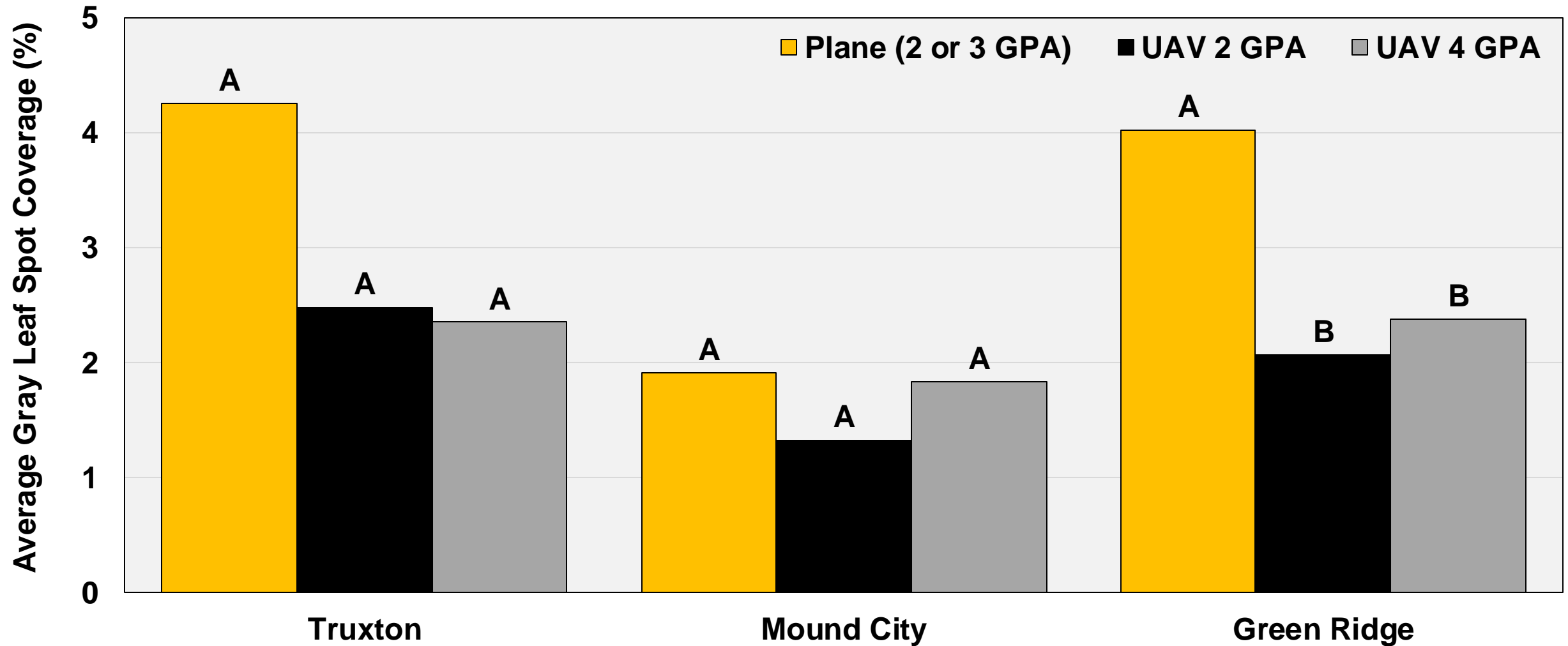
# Average Tar Spot Leaf Coverage at R6



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

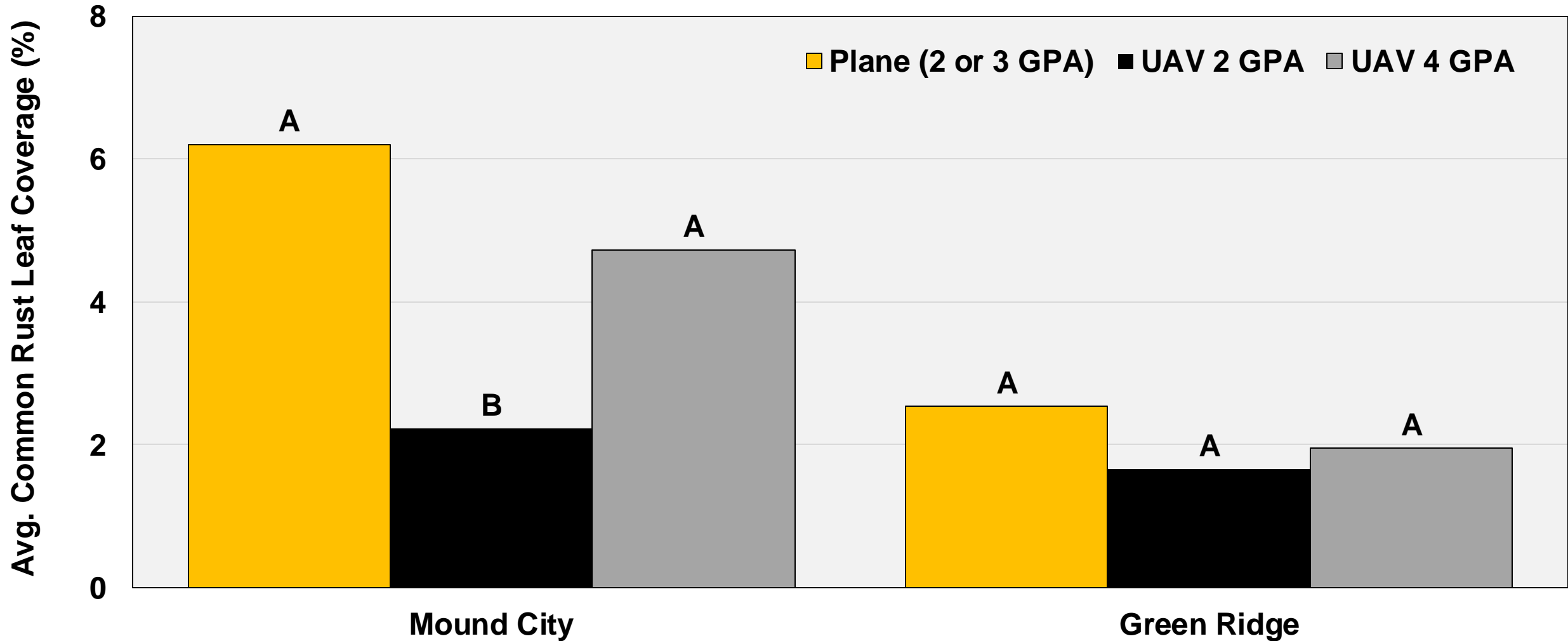


# Average Gray Leaf Spot Leaf Coverage at R6



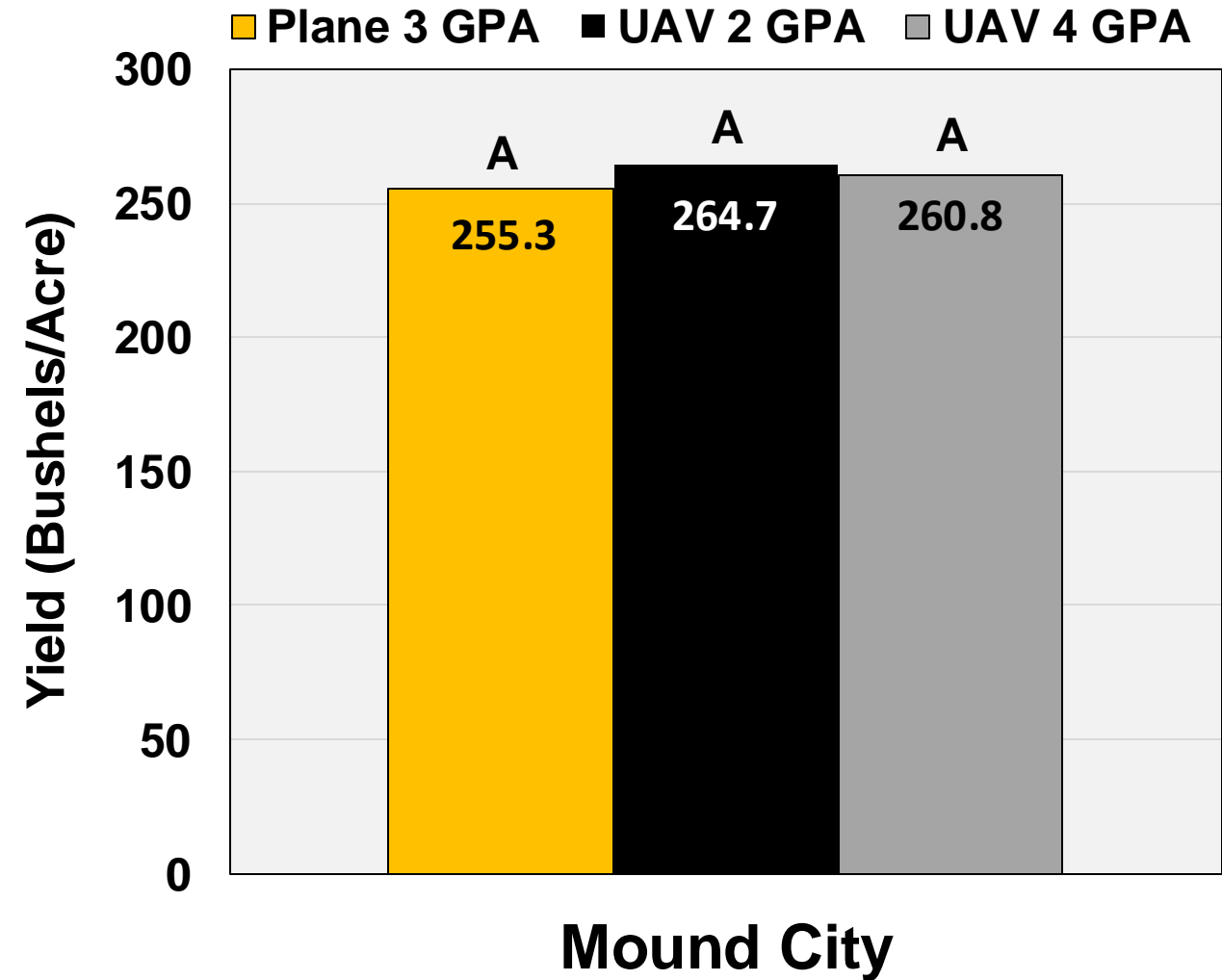
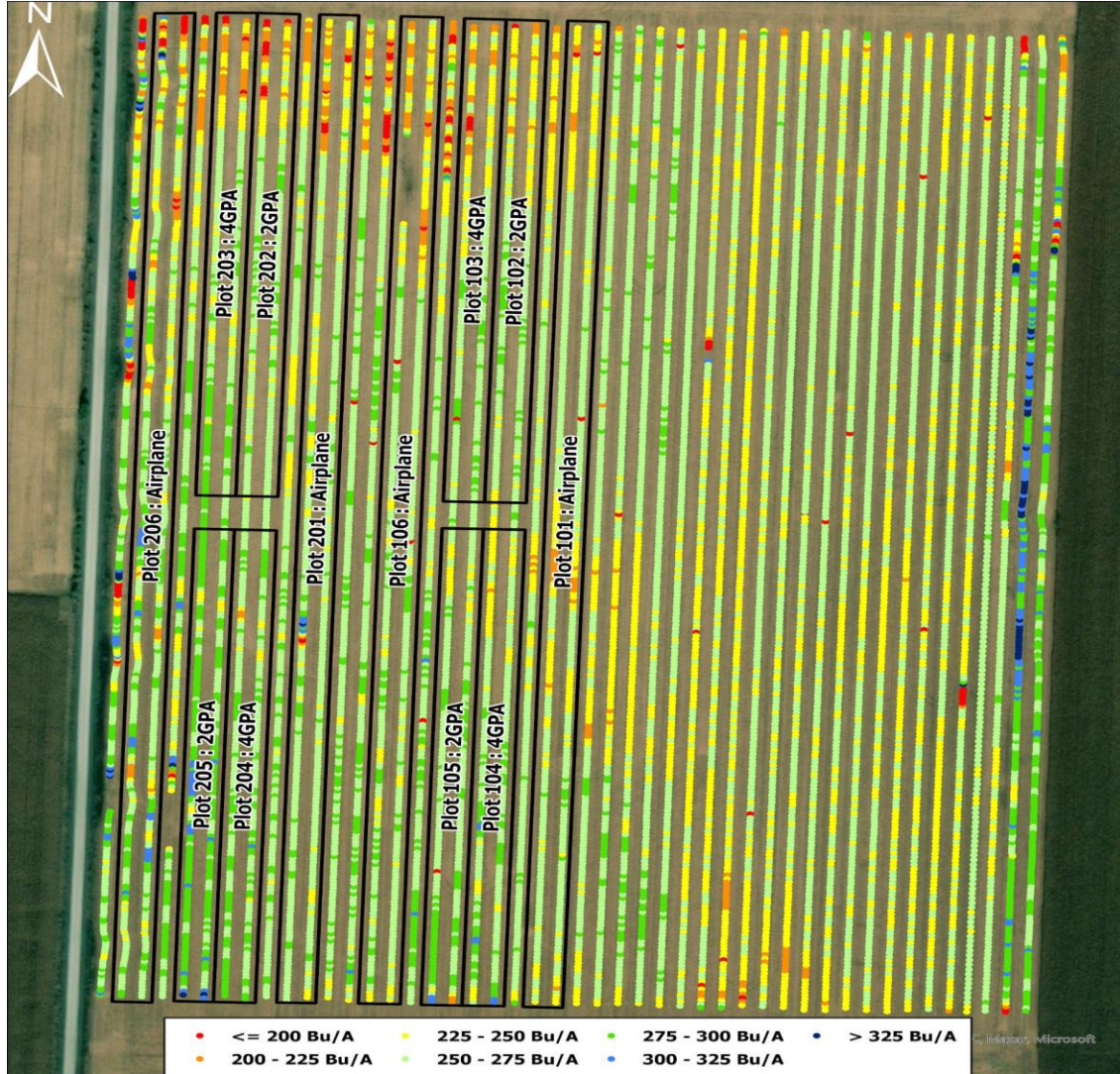
\*Bars within a location followed by the same uppercase or lowercase letters are not different, LSD=0.05.

# Average Common Rust Leaf Coverage at R6



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

# Corn Yield Response to Treatments (Mound City 2024)



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

# Conclusions

- **Plane application resulted in less coverage than UAV 2 or 4 GPA applications at Green Ridge**
- **UAV 4 GPA application resulted in higher spray coverage than UAV 2 GPA or plane application at Mound City**



# Conclusions

- UAV applications resulted in similar or lower disease severity by R6 across all locations
- Application method did not have a statistically significant impact on corn yield at the Mound City location
- Still collecting corn yield data from the Green Ridge and Truxton locations



# Acknowledgements

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