



# Compared efficacy of fungicide application methods in irrigated corn

M. G. Henrickson and Dr. Alyssa Koehler, University of Delaware



## Introduction

- Due to sandy soils, approximately 50% of Delaware corn acreage is irrigated.
- A major disease in corn production is *Cercospora zea-maydis*, also known as gray leaf spot (GLS).
- High planting populations, and humid canopies favor infection by GLS (Fig 1)<sup>2</sup>.
- The most common practice in irrigated corn for managing this disease is an aerial fungicide application during the R1 growth stage.
- Growers have expressed interest in fungicide applications via center pivot (fungigation).
- In 2021, Xyway LFR (active ingredient flutriafol) was labeled for in-furrow and 2x2 applications.

## Objective

Investigate the efficacy of four fungicide application methods, and in-season combinations of them.

## Methods

- In 2021, a trial was established at the UD Warrington Irrigation Farm to compare the efficacy of four application methods, and in-season combinations (Table 1).
- The trial was established in 90' x 90' randomized plots with each block containing two hybrids (63P75RIB and 64B28RIB).
- Disease severity was visually assessed at the R5 growth stage as percent of ear leaf covered in GLS lesions.
- Yield was documented with an Allis-Chalmers Gleaner K2 combine at the end of the season.

## Treatments

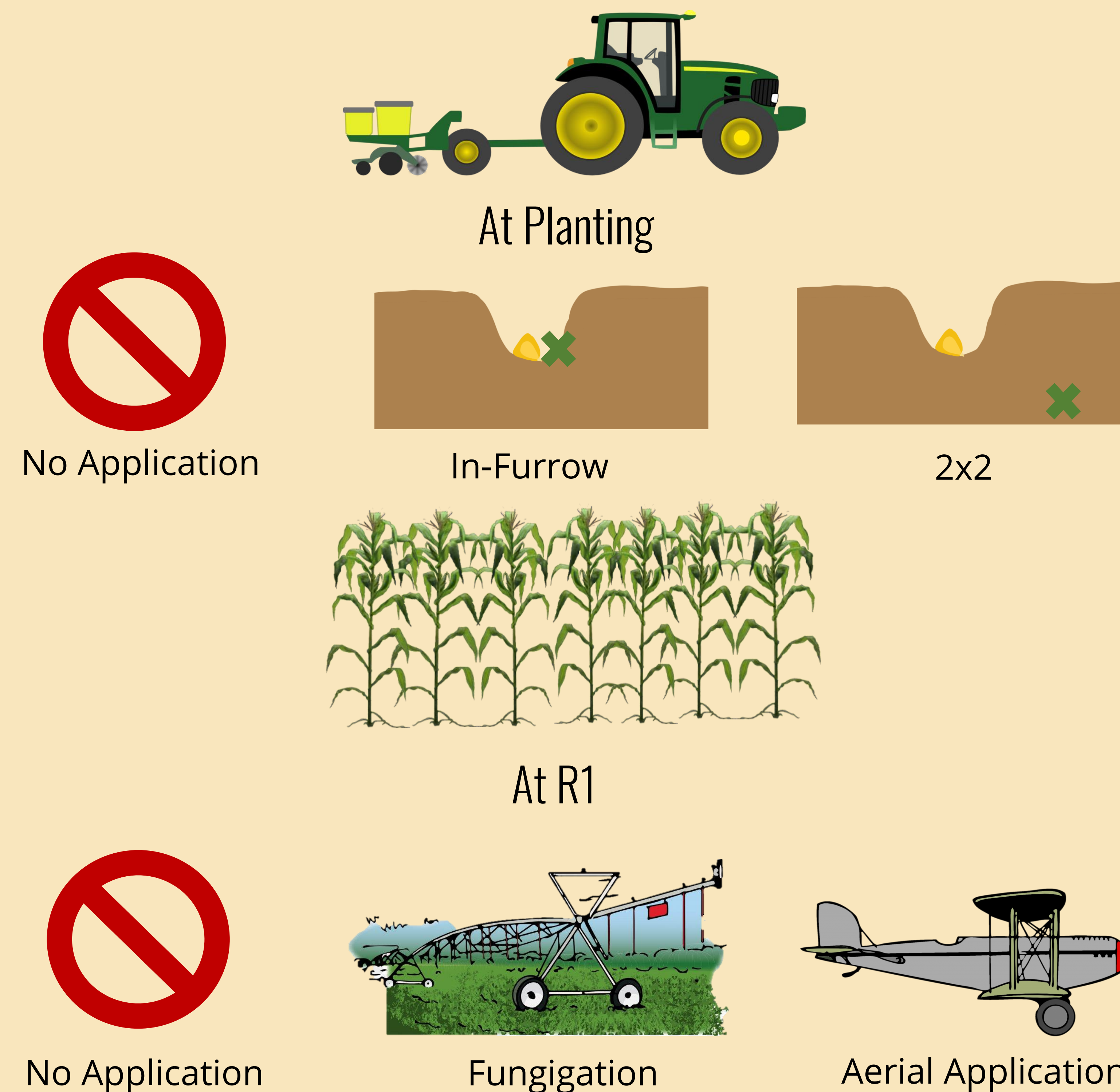


Table 1: Breakdown of treatment combinations for application trial.

Treatment	Xyway In-furrow	Xyway 2x2	Aerial Application at R1	Fungigation At R1
1				
2			✓	
3				✓
4	✓			
5	✓			
6	✓			
7		✓		
8		✓	✓	
9		✓		✓

## Results

- In both hybrids, all treatments significantly reduced disease severity compared to the control ( $p < 0.0001$ ) (Fig 2).
- Aerial only, in furrow followed by aerial, and 2x2 followed by aerial treatments had lowest disease (Fig 2).
- In hybrid 63P75RIB, treatment yields were higher than the no fungicide control in all treatments except for in-furrow only and fungigation only ( $p = 0.04$ ) (Fig 3).
- All treatments, except 2x2 only, had higher yield than the control ( $p = 0.02$ ) (Fig 3).

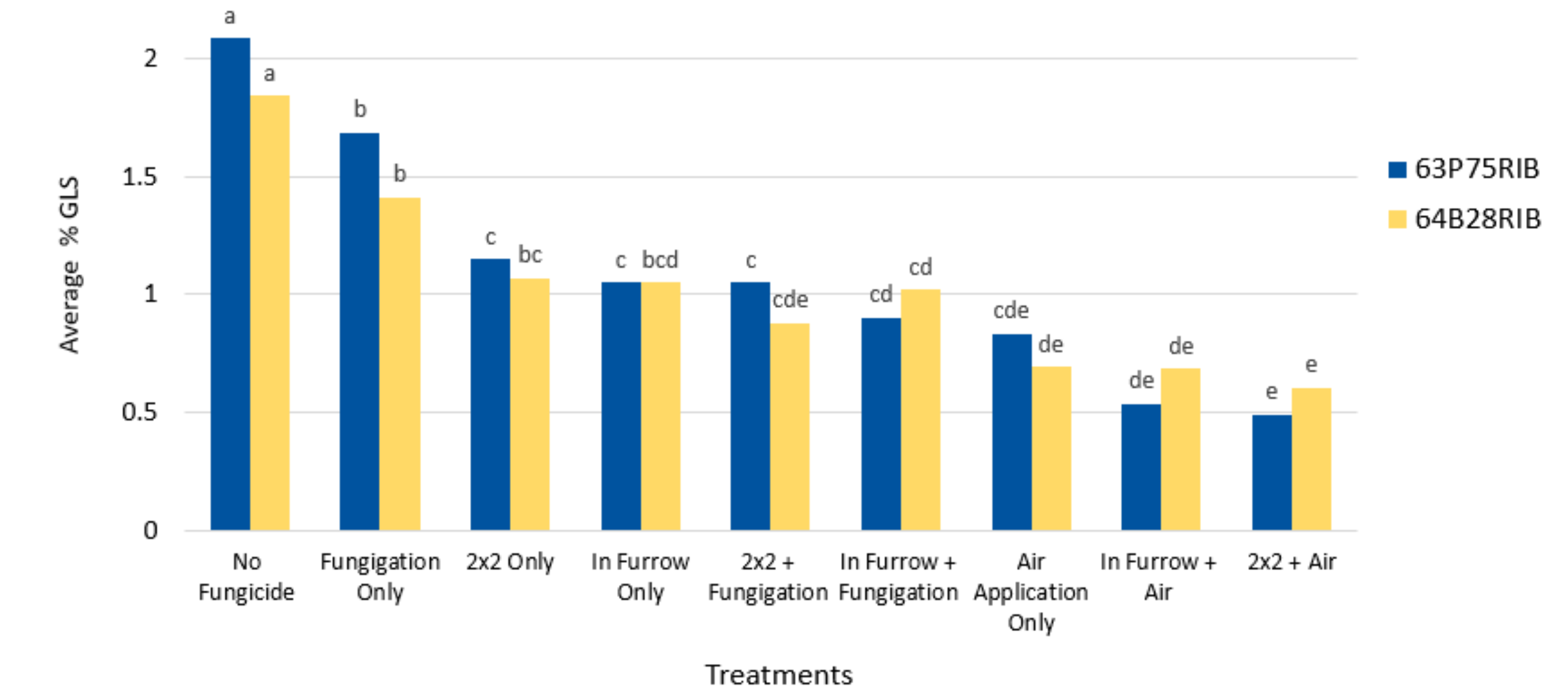


Fig 2: Average percent GLS on ear leaves of each treatment. Treatments followed by the same letter within each hybrid are not significantly different based on Fisher's Least Significant Difference (LSD;  $\alpha = 0.05$ ).

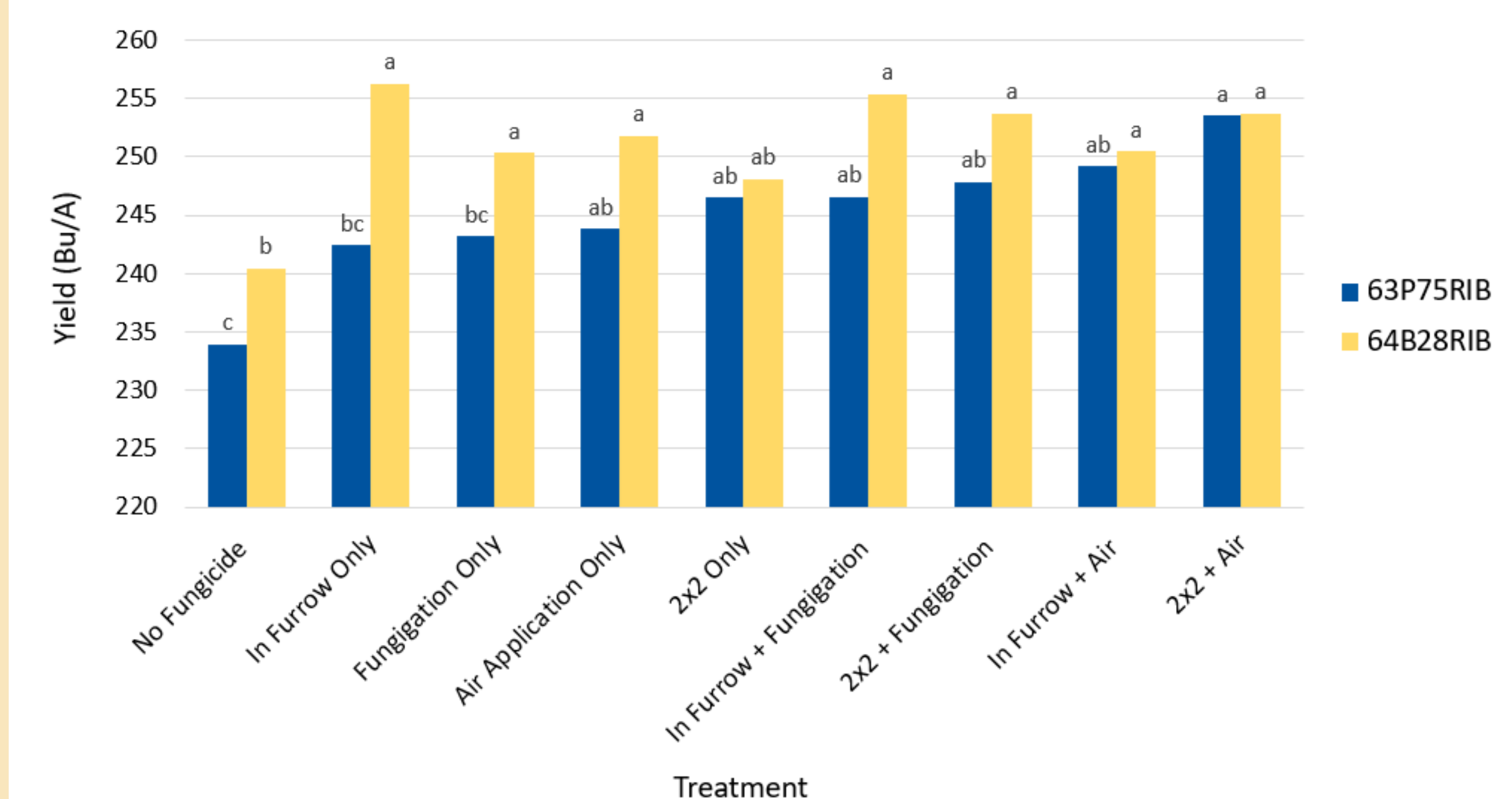


Fig 3: Treatment yields in bu/a. Treatments followed by the same letter within each hybrid are not significantly different based on Fisher's Least Significant Difference (LSD;  $\alpha = 0.05$ ).



Fig 1: Progression of GLS lesions from beginning of infection (left) to sporulation (right).

## Acknowledgments

I would like to thank the Warrington Irrigation Farm, James Adkins, and Christopher Holton for their help with this research project.

## References

- <sup>1</sup>Wise KA, Smith D, Freije A, Mueller DS, Kandel Y, Allen T, Bradley CA, Byamukama E, Chilvers M, Fasje T, Friskop A, Hollier C, Jackson-Ziems TA, Kelly H, Kemeraik B, Price P 3rd, Robertson A, Tenuta A. Meta-analysis of yield response of foliar fungicide-treated hybrid corn in the United States and Ontario, Canada. PLoS One. 2019 Jun 5;14(6):e0217510. doi: 10.1371/journal.pone.0217510. PMID: 31166965; PMCID: PMC6550426.
- <sup>2</sup>G. P. Munkvold, C. A. Martinson, J. M. Shriver, and P. M. Dixon Probabilities for Profitable Fungicide Use Against Gray Leaf Spot in Hybrid Maize. Phytopathology © 2001 91:5, 477-484.