

Evaluation of Target Spot (*Rhizoctonia solani*) Fungicide Products and Application Methods on disease occurrence, yield, and leaf quality of Burley Tobacco.

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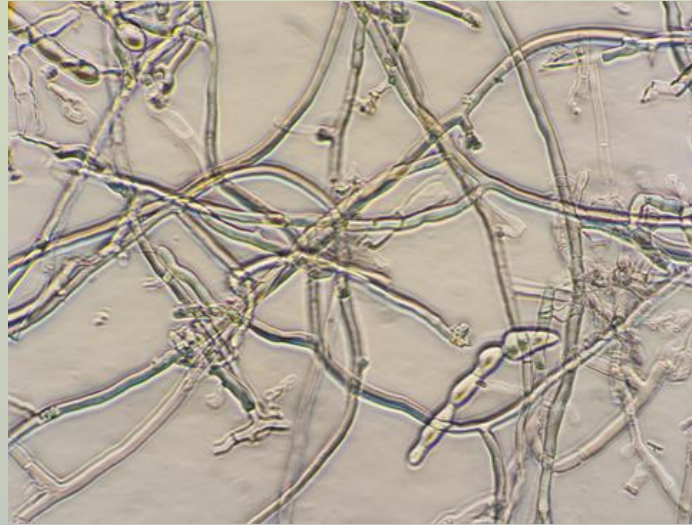
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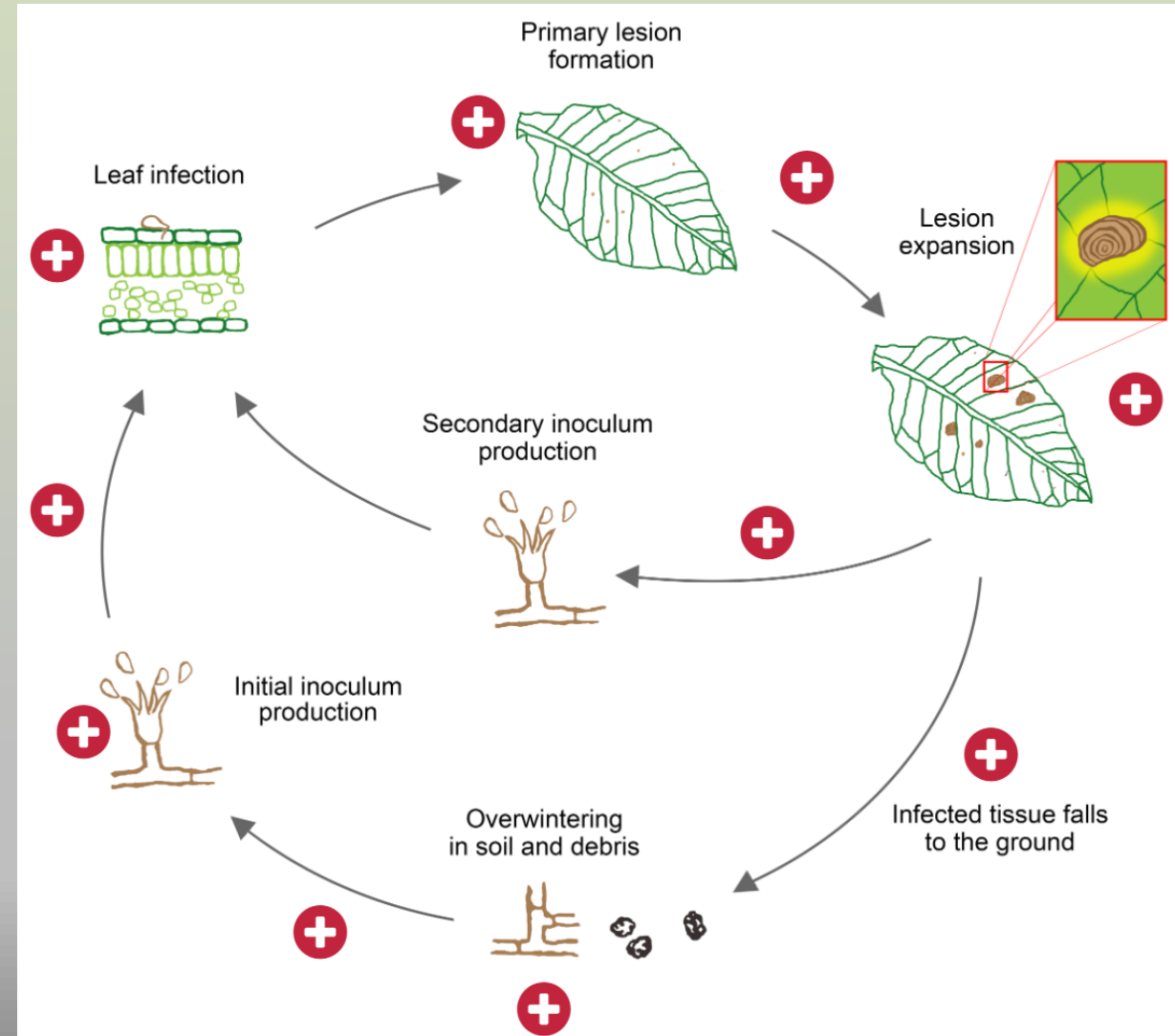
Target Spot Introduction

- Pathogen: *Rhizoctonia solani*
- Symptoms: Target-like lesions
- Management: Proper fertilization practices and fungicides



Target Spot Life Cycle

- Polycyclic
- Moderate temperatures, high relative humidity, and prolonged periods of leaf wetness

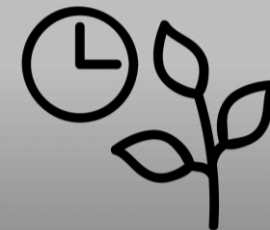


Is Quadris still effective?

- Growers are reporting a lack of Target spot control
- Quadris-azoxystrobin
 - Main fungicide used since early 2000s
 - Known resistance in other cropping systems



- Is it the application methods?
- Is it timing of application?



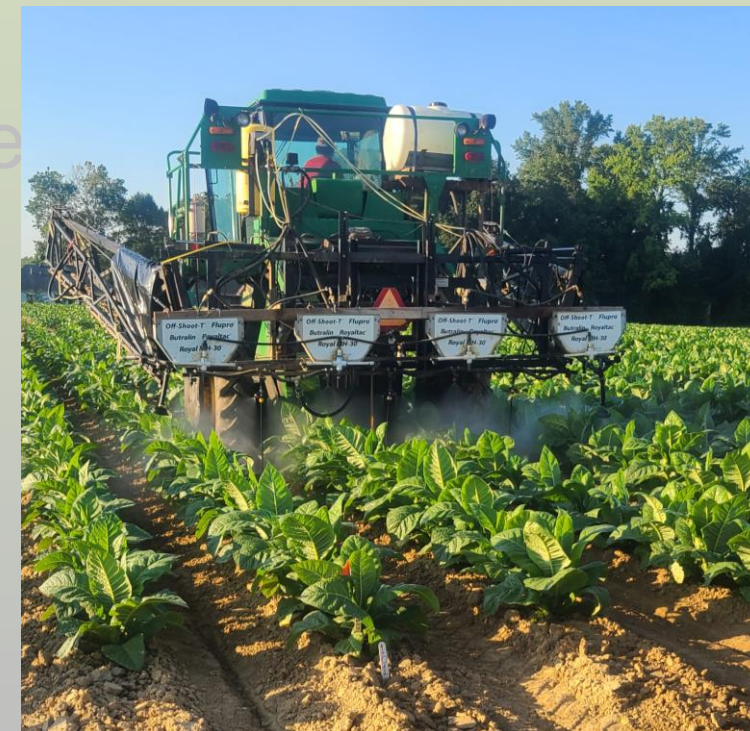
Research Objectives

- **Objective 1:** Evaluate efficacy of fungicides (Quadris and Miravis Top) for control of Target Spot when applied preventatively compared to reactively
- **Objective 2:** Investigate if sprayer arrangement (broadcast and drop nozzle) influences control of Target Spot disease
- **Objective 3:** Investigate if fungicide application timing (preventative and curative) influences control of Target Spot disease



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- **Objective 3:** Screen isolates for sensitivity to Quadris and Miravis Top



Fungicide Products


PULL HERE TO OPEN ▶

AZOXYSTROBIN	GROUP 11	FUNGICIDE
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Quadris®

Flowable Fungicide



Broad spectrum fungicide for control of plant diseases

Active Ingredient:
 Azoxystrobin: methyl (E)-2-[2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl]-3-methoxyacrylate* 22.9%

Other Ingredients: 77.1%


Total: 100.0%

Contains 2.08 lb of active ingredient per gallon
 *IUPAC


QoI- Quinone outside Inhibitors

DIFENOCONAZOLE	GROUP 3	FUNGICIDE
PYDIFLUMETOFEN	GROUP 7	FUNGICIDE

PULL HERE TO OPEN ▶



Miravis® Top



Fungicide

ADEPIDYN® Technology*

Active Ingredients:
 Pydiflumetofen** : 6.9%
 Difenoconazole*** : 11.5%

Other Ingredients: 81.6%

Total: 100.0%

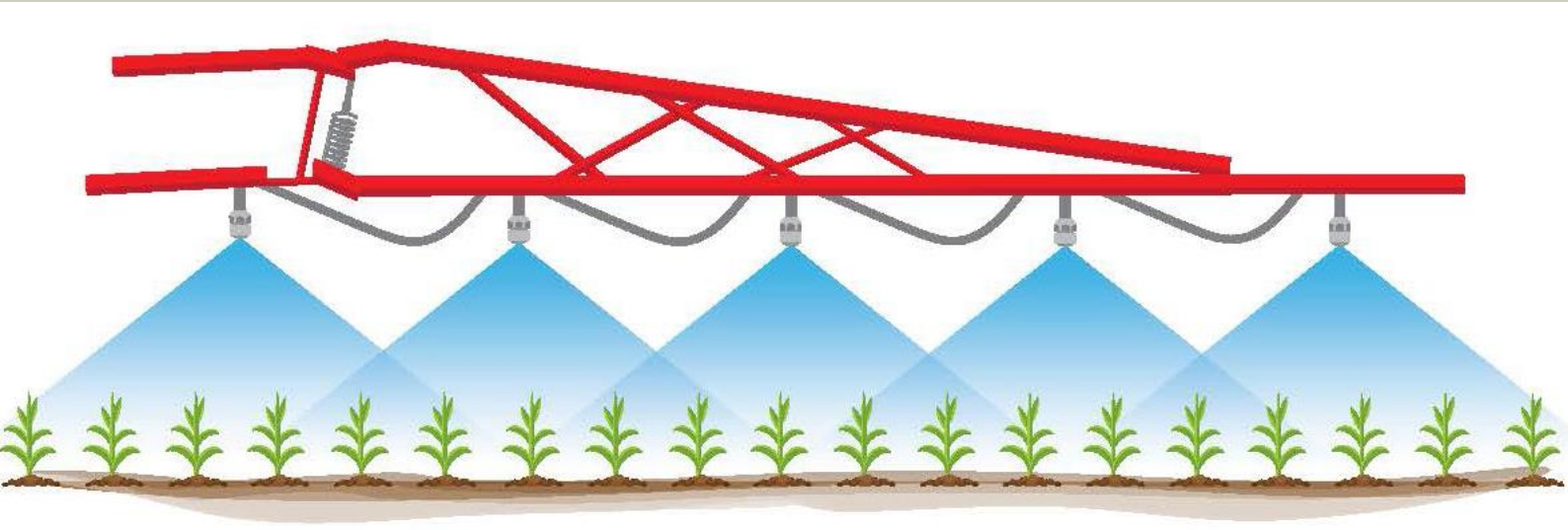
*Technology denotes the active ingredient Pydiflumetofen
 **CAS No. 1228284-64-7
 ***CAS No. 119446-68-3

Miravis® Top is formulated as a suspension concentrate and contains 0.63 lb of pydiflumetofen and 1.04 lb difenoconazole per gallon.

SDHI - succinate dehydrogenase inhibitor

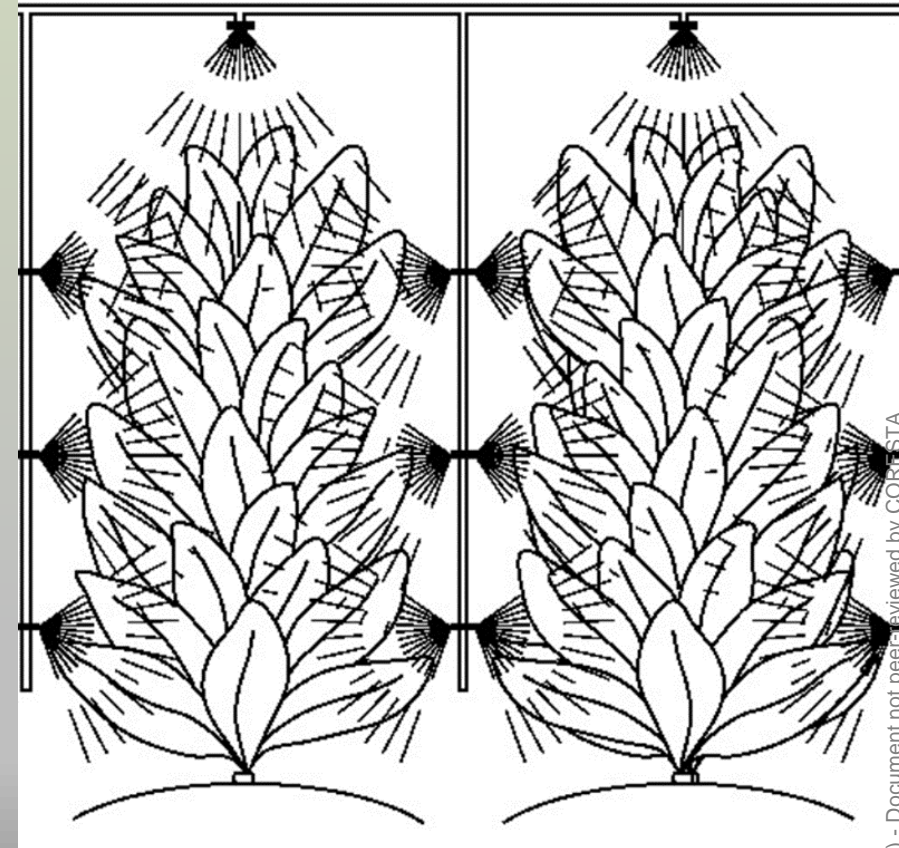
Spray Methods

Broadcast Application



© Land grant press by Clemson Extension

Drop Nozzle Application



© Ontario Crop Protection Hub

Preventative vs Reactive

- Preventative
 - Fungicide applied before pathogen is present
- Reactive
 - Fungicide applied after pathogen is established



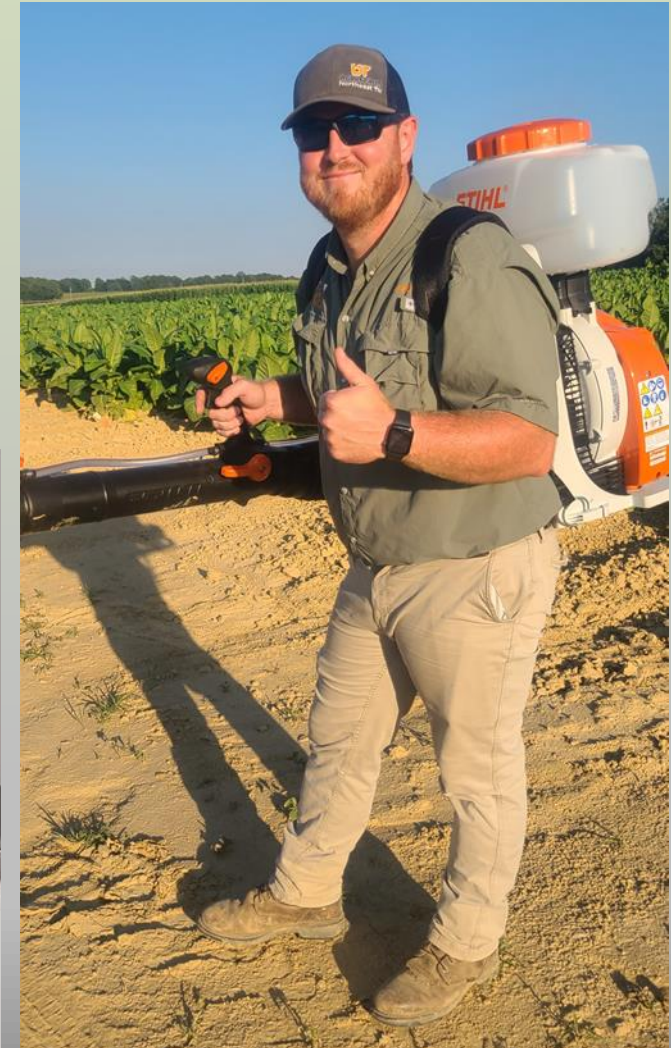
Methods

- Location: Highland Rim Research and Education Center
- Variety: KT222LC
- Randomized complete block design with four replications
- Four row plots, 30 ft x 14 ft
- Center two rows harvested
- Disease ratings
- Statistics analyzed by SAS 9.4 Proc glimmix



Target Spot Inoculation

- Inoculated July 11th (after layby)
- Targeted lower leaves
- STIHL backpack leaf blower
 - Opening 4
 - Speed setting 1
 - Rate 32 gallons/acre

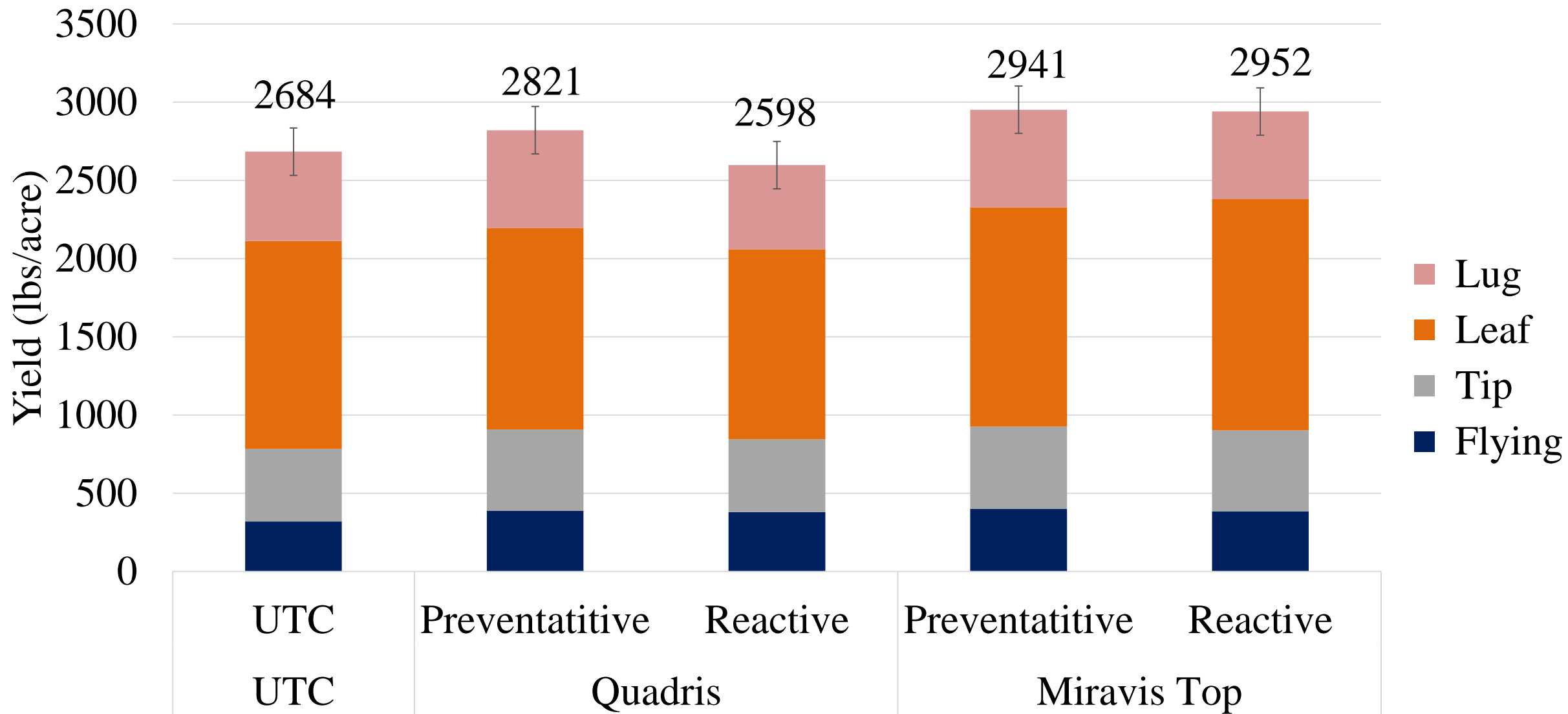


Preventative vs Reactive Experiment

Trt	Treatment Name	Preventative or Reactive	App Timing	App Type
1	Untreated; Inoculated			
2	Quadris	Preventative	Layby	Broadcast
	Cueva	Preventative	3-wk later	Broadcast
	Quadris	Preventative	Topping	Broadcast
3	Miravis Top	Preventative	Layby	Broadcast
	Cueva	Preventative	3-wk later	Broadcast
	Miravis Top	Preventative	Topping	Broadcast
4	Quadris	Reactive	Threshold	Broadcast
	Cueva	Reactive	3-wk later	Broadcast
	Quadris	Reactive	Topping	Broadcast
5	Miravis Top	Reactive	Threshold	Broadcast
	Cueva	Reactive	3-wk later	Broadcast
	Miravis Top	Reactive	Topping	Broadcast

Preventative vs Reactive

p = 0.4142

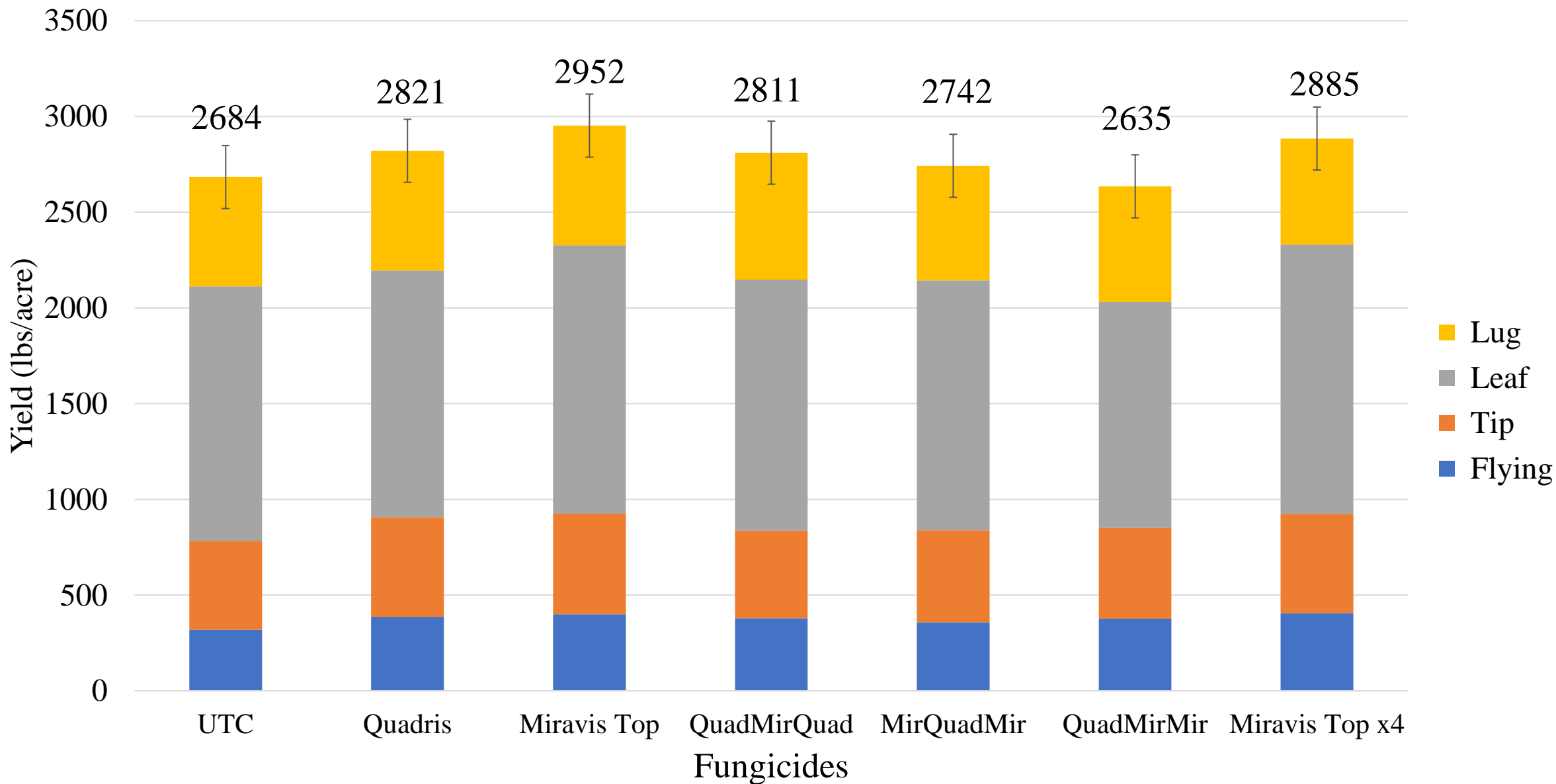


Spray Program

Trt	Treatment Name	Application Timing	Application Type
1	Untreated; Inoculated		
2	A-Quadris B-Cueva C-Quadris	Layby 3-wk later Topping	Broadcast Broadcast Broadcast
3	A-Miravis Top B-Cueva C-Miravis Top	Layby 3-wk later Topping	Broadcast Broadcast Broadcast
4	Quadris Miravis Top Quadris	Layby 3-wk later Topping	Broadcast Broadcast Broadcast
5	Miravis Top Quadris Miravis Top	Layby 3-wk later Topping	Broadcast Broadcast Broadcast
6	Quadris Miravis Top Miravis Top	Layby 3-wk later Topping	Broadcast Broadcast Broadcast
7	Miravis Top Miravis Top Miravis Top Miravis Top	Layby 3-wk later 3-wk later Topping	Broadcast Broadcast Broadcast Broadcast

Fungicide Spray Program

p= 0.8306

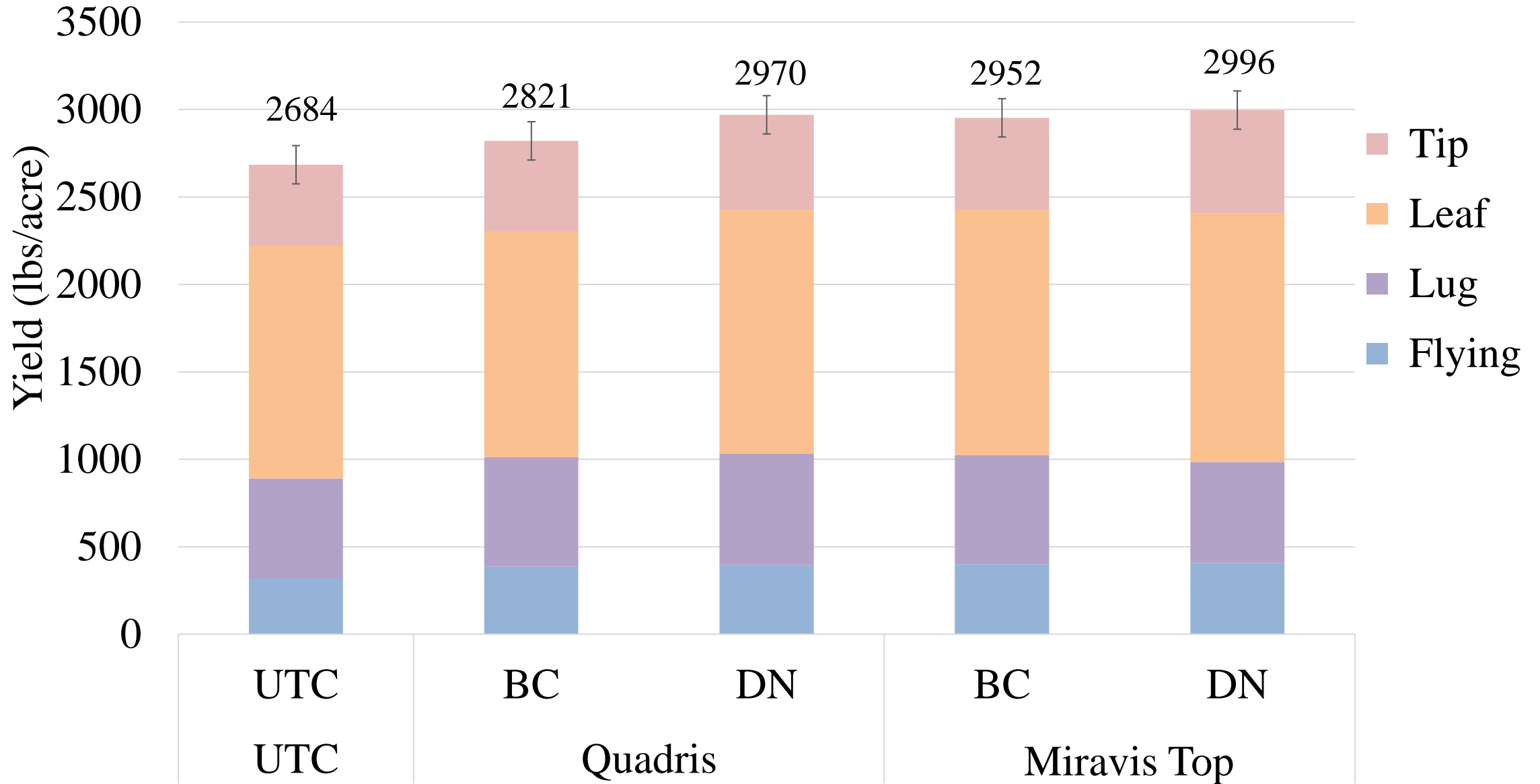


Broadcast vs Drop Nozzle

Trt	Treatment Name	App Timing	App Type
1	Untreated; Inoculated		
2	A-Quadris B-Cueva C-Quadris	Layby 3-wk later Topping	Broadcast Broadcast Broadcast
3	A-Quadris B-Cueva C-Quadris	Layby 3-wk later Topping	Broadcast Broadcast Drop Nozzle
4	A-Miravis Top B-Cueva C-Miravis Top	Layby 3-wk later Topping	Broadcast Broadcast Broadcast
5	A-Miravis Top B-Cueva C-Miravis Top	Layby 3-wk later Topping	Broadcast Broadcast Drop Nozzle

Broadcast vs Drop Nozzle Application

p= 0.2825



Conclusion

- Quadris should be applied preventatively to help protect yields.
- Yield responses were not observed in any of the trials.
- We did not see a response with more than 2 applications of Miravis Top.
- Field inoculation was not successful, techniques will be addressed in 2024.

Future Work

- Repeat Trials
- Add more locations
 - Northeast Tennessee Research and Education Center
 - On-farm



Acknowledgements

- Dr. Mitchell Richmond
- Richmond Lab
- Dr. Zach Hansen
- HRREC

