

# Optimizing Wheat Fungicide Management

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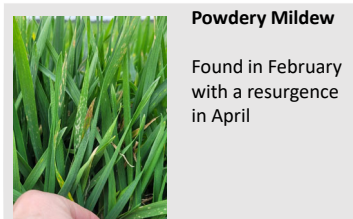


## QUESTIONS

1. Timing: When should we apply fungicides?
2. Cost: How much expense is worth it?
3. Should we spray when there is no disease?

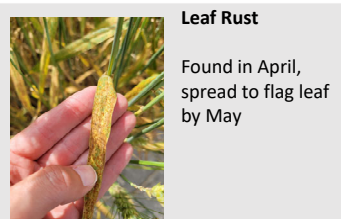
## ANSWERS SO FAR

1. Timing: In Kinston, NC in 2023 under high disease pressure, applying fungicides in both February and April was the most profitable but was not statistically different from the control.
2. Costs: The resistant line didn't need fungicide to be profitable, even with two fungal diseases present. The susceptible line did need protective fungicide applications to be profitable.
3. It is not economically beneficial to apply fungicides in the absence of fungal disease.



### Powdery Mildew

Found in February with a resurgence in April



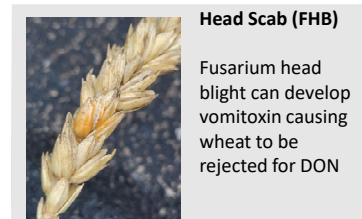
### Leaf Rust

Found in April, spread to flag leaf by May



### Septoria Nodorum Blotch (SNB)

Begins on leaves and can reduce grain quality if heads are infected



### Head Scab (FHB)

Fusarium head blight can develop vomitoxin causing wheat to be rejected for DON

## PROJECT SUMMARY

This study investigates different fungicide application timings and modes of action to identify which fungicide approach is most cost-effective.



The project was planted in 2022 at the Caswell Research Station in Kinston, NC.

## MATERIALS & METHODS

The replicated (n=4) and randomized small plot research included these combinations:

### 2 Varieties

- USG 3536 (Moderately resistant to scab and powdery mildew)
- Croplan 9606 (Susceptible to scab, moderately susceptible to powdery mildew)

### 3 Fungicides

- None (check)
- Miravis Ace – pydiflumetofen+propiconazole
- Tilt – propiconazole

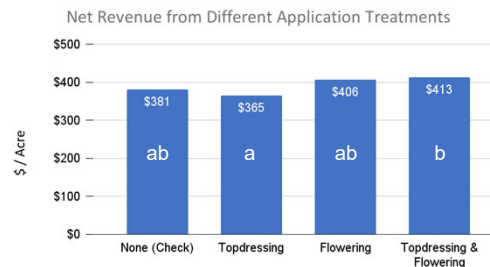
### 3 Application Timings

- Top-dress (before GS 30)
- Flowering
- Top-dress & Flowering

## RESULTS

In both 2021 and 2022 in the Piedmont, no significant fungal diseases appeared in the test. There were no significant yield or quality improvements from fungicide applications that covered the costs of the applications in those years.

In 2023 in Kinston, NC we observed powdery mildew, leaf rust and SNB in the plots. Disease severity was documented for each plot before fungicide applications and three weeks after. No FHB was present. When examining revenue, the only significant factor was timing (P=0.01).



In a year of moderate foliar disease pressure, applications at topdressing or topdressing+flowering generated the numerically highest net revenues, but they were not statistically different from the unsprayed check.

## ECONOMICS

“Revenue” is calculated using:

- Yield in bushels / acre x market price of \$5.94 (grain quality did not qualify for milling wheat).
- Drive-down of the wheat (2.8% with a 90' boom sprayer) was subtracted from the yield for treatments at flowering when plants are lost due to tire tracks.
- Application cost of \$12/acre per pass
- Dockage for test weight below 54 lbs./bushel according to local grain discount schedules
- Fungicide costs were based on the labeled rate and the price paid for the product:
  - Miravis Ace - \$19.00/A per application
  - Tilt - \$3.05/A per application

Typical input and overhead costs were omitted from the analysis for the purpose of comparing only the treatments.



Plots in Kinston on harvest day 06-Jun-2023

This experiment is being repeated in the 2023-2024 season in Kinston, NC.



## ACKNOWLEDGEMENTS

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