# Re-Evaluating Optimal N and Seeding Rates for Corn Production in North Carolina

## Year 1 (2026) Report

## SUMMARY

- Corn hybrids response to N and seeding rates in 2026 were location specific.
- At all study locations, increasing seeding rates had a greater impact on yield than increasing N rates (+23% vs. +5%).
- At three of the six sites (Rowan, Sampson and Yadkin), there was no response of corn to N rates.
- Where there was a response to N, optimal N rates were between 100-150 lbs N/acre.
- Increasing N to high rates (> 200 lbs. N/acre), did not increase partial net return.
- DKC 68-35 was the best performing hybrid in this study, across treatments and locations.
- This study needs to be replicated for at least two more years to confirm the results before we can make agronomic recommendations.

## 1. INTRODUCTION

The goal of this project was to:

1. Identify economically optimal nitrogen rates across 6 different growing environments in North Carolina.
2. Identify economically optimal seeding rates across 6 different growing environments in North Carolina.
3. Determine if differences in nitrogen use efficiency exist in 3 elite corn hybrids.

Table 1. Summary of treatments applied at each location.

| Location | Nitrogen Rates (lb N/acre) | Target Seeding Rates (plants/acre) | Hybrids |
|---|---|---|---|
| Beaufort | 50 | 28,000 | P10705 |
| | | 34,000 | |
| | 100 | 42,000 | |
| Currituck<br>Robeson<br>Rowan<br>Samspon<br>Yadkin | 150 | 20,000 | DKC 68-35 |
| | 200 | 26,000 | DKC 113-83 |
| | 250 | 32,000 | |

Grain yield and partial net return were analyzed separately for each location using a mixed-effects model in SAS PROC GLIMMIX (SAS 9.4). Corn hybrid, plant population, nitrogen (N) rate, and their interactions were treated as fixed effects, while replication and replication x N rate interaction were considered random effects. Treatment means were compared using pairwise comparisons of least-squares means at a significance level of $\alpha = 0.05$.

## 2. RESULTS

### 2.1 Beaufort Co.

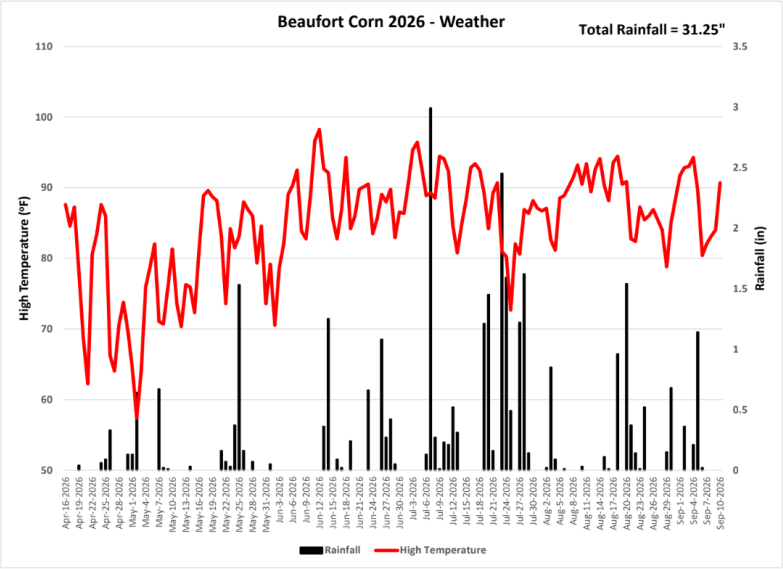
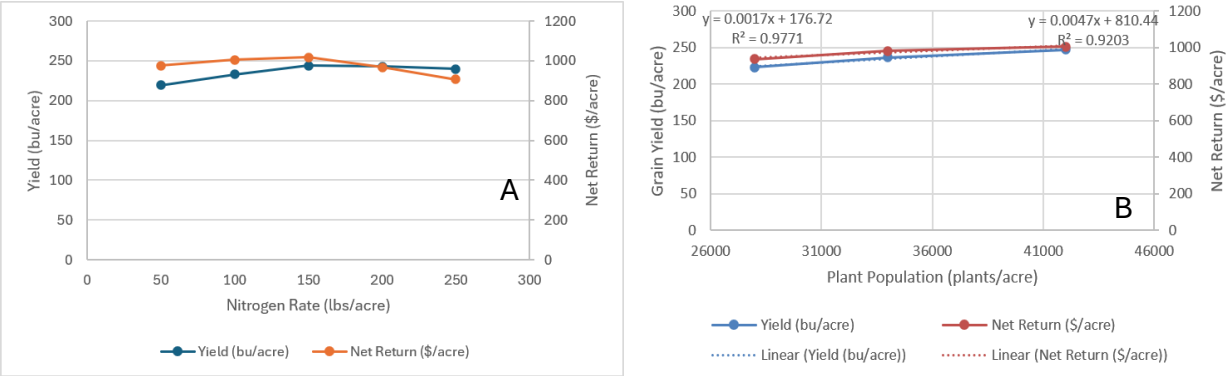



**Figure 1.** Corn yield (bu/acre) and net return ($/acre) as an effect of nitrogen rate (A) and plant population (B).



## 2.2 Currituck Co.

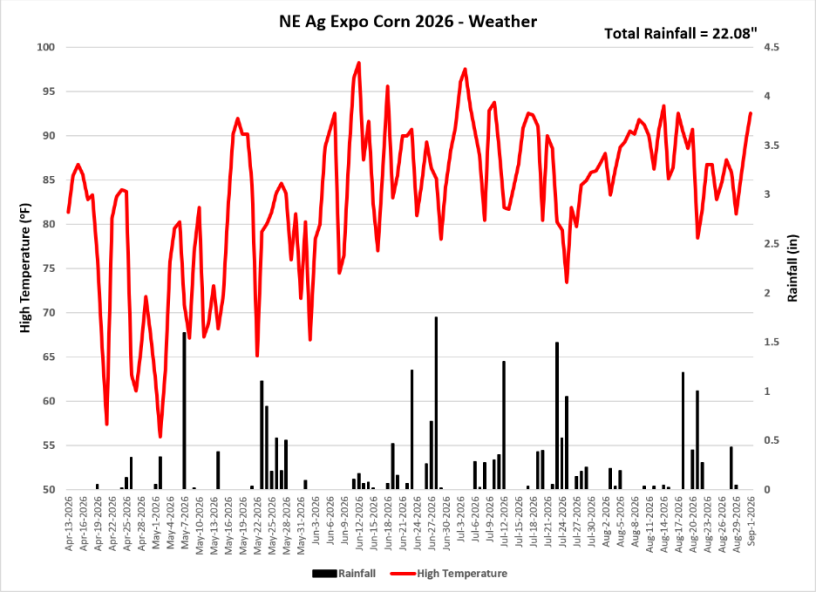
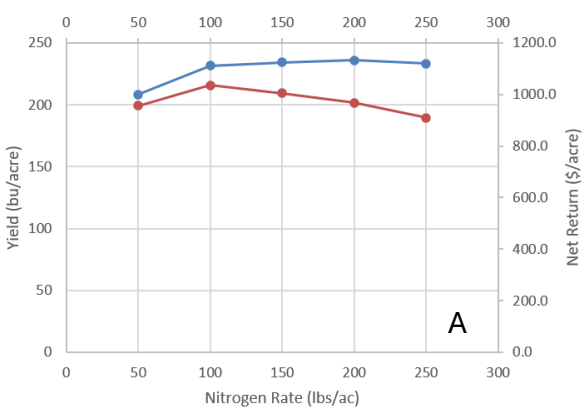
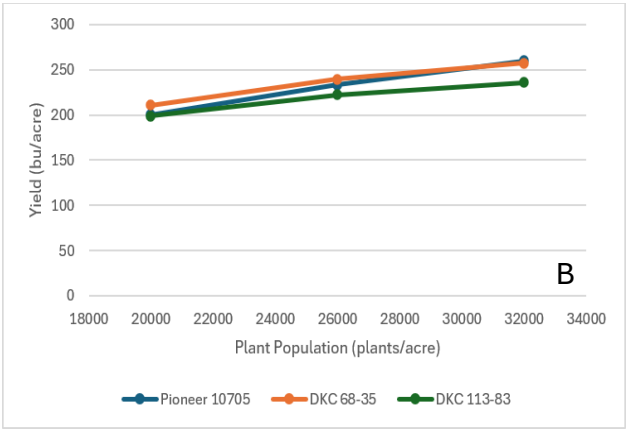
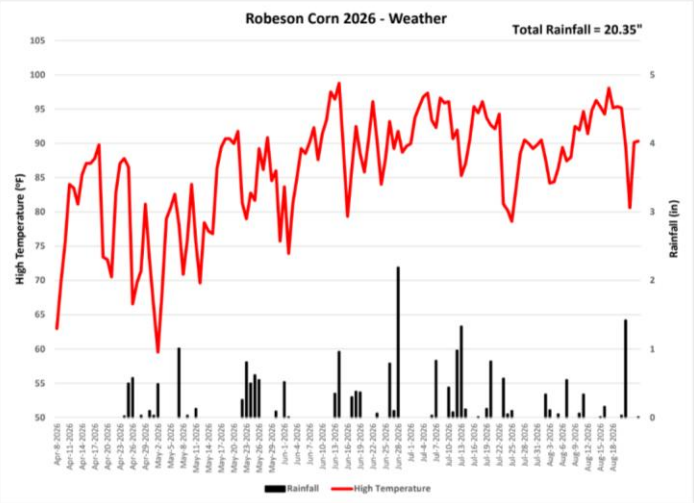



**Figure 2.** Corn yield (bu/acre) and net return as an effect of nitrogen rate (A) and grain yield (bu/acre) as an effect of plant population (B).



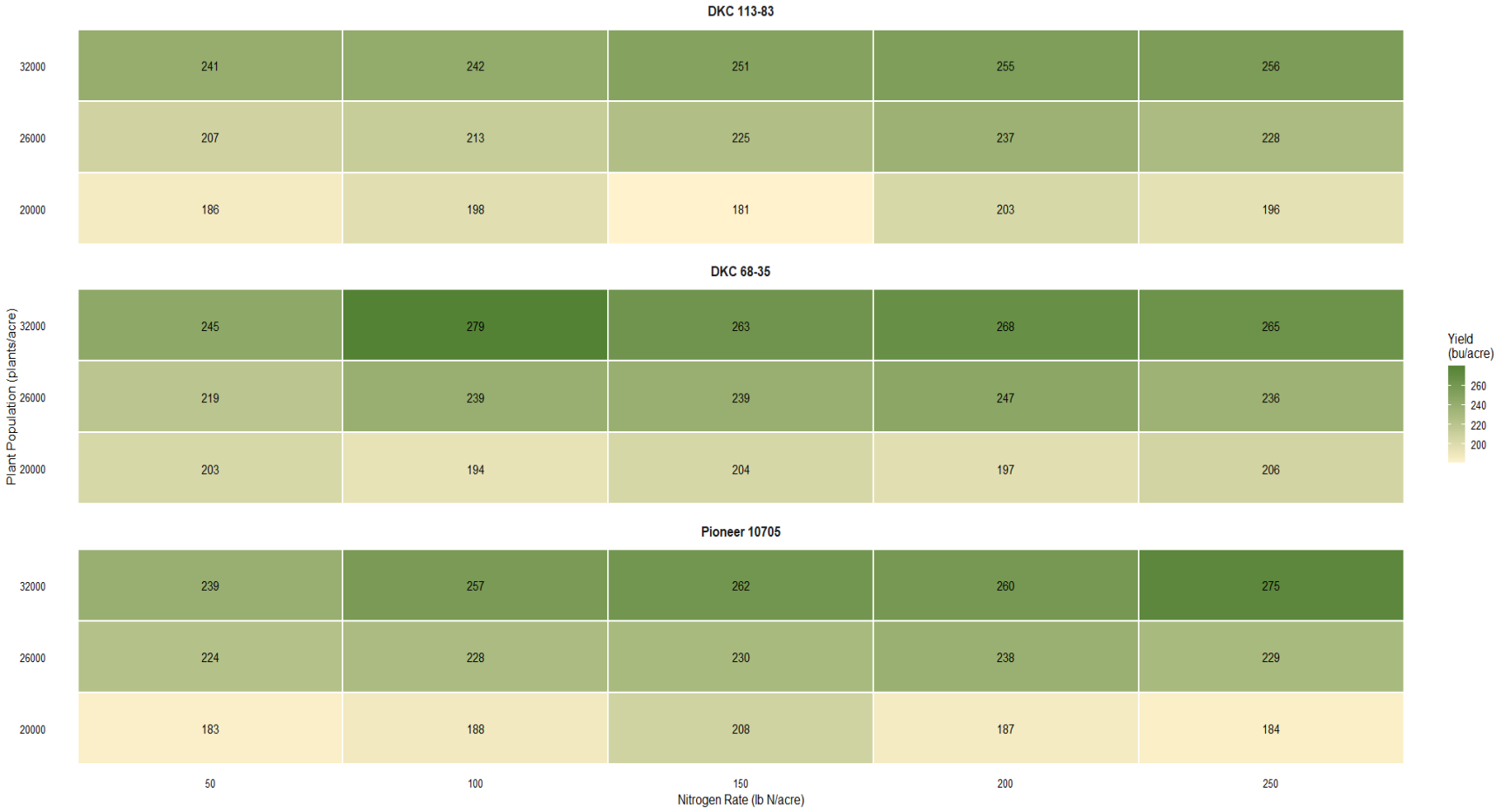



## 2.3 Robeson County



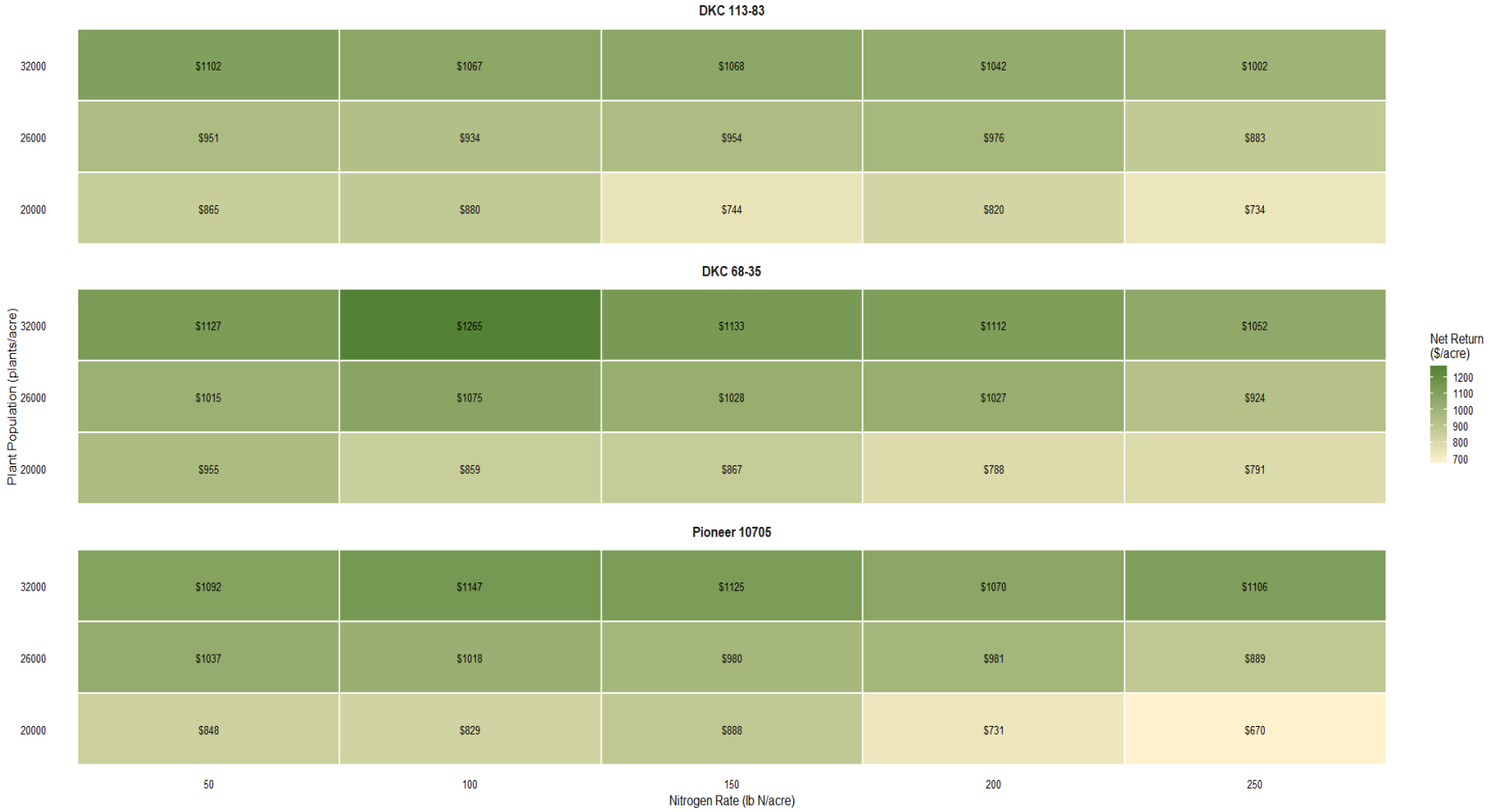
**Corn Grain Yield Response to Nitrogen Rate and Plant Population**

Robeson County, NC (2026)



**Partial Net Return by Nitrogen Rate and Plant Population**

Robeson County, NC (2026)



## 2.4 Rowan Co.

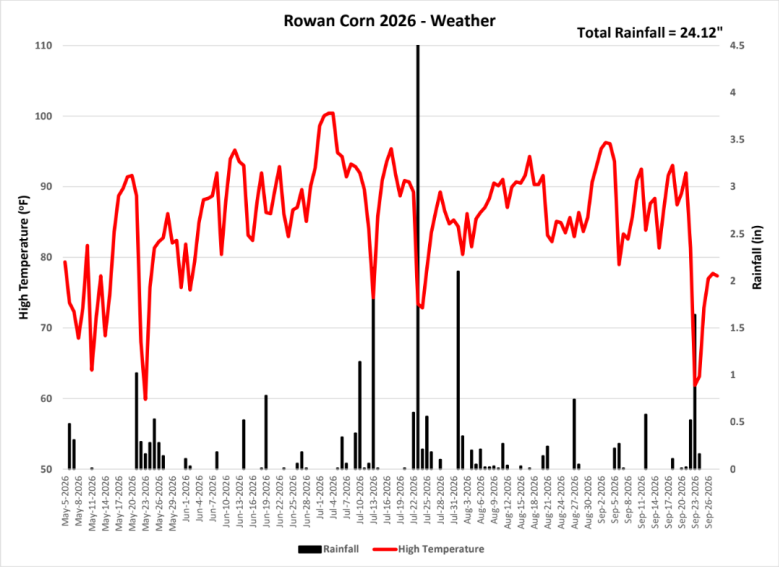



**Figure 3.** Corn yield (bu/acre) (A) and net return ($/acre) (B) as an effect of plant population.

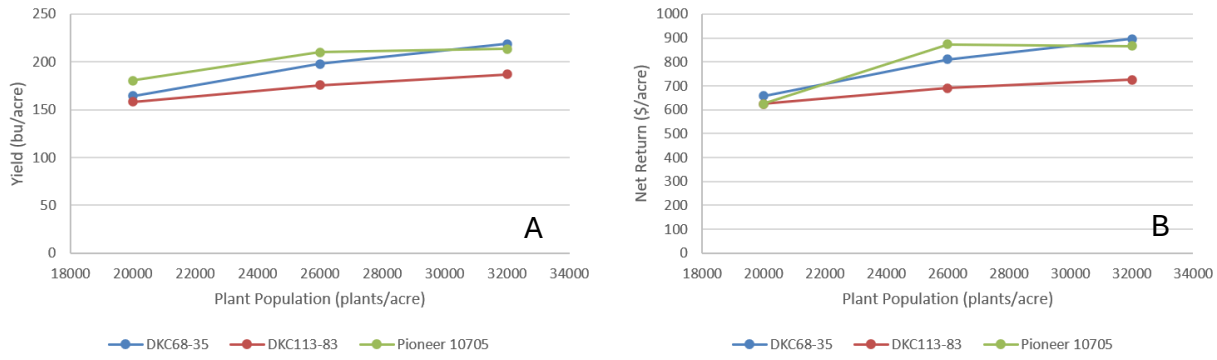
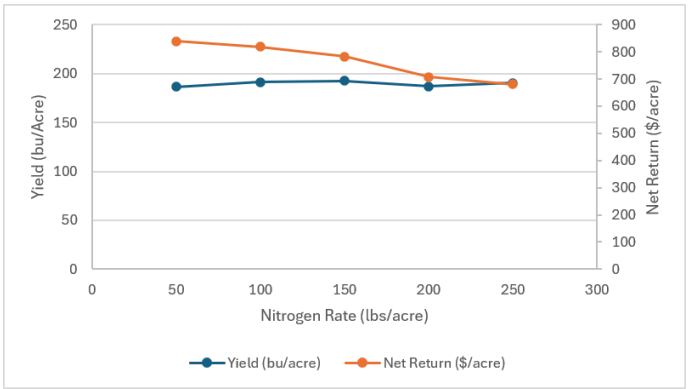



**Figure 4.** Corn yield (bu/acre) and net return ($/acre) as an effect of nitrogen rates (lbs N/acre)



## 2.5 Sampson Co.

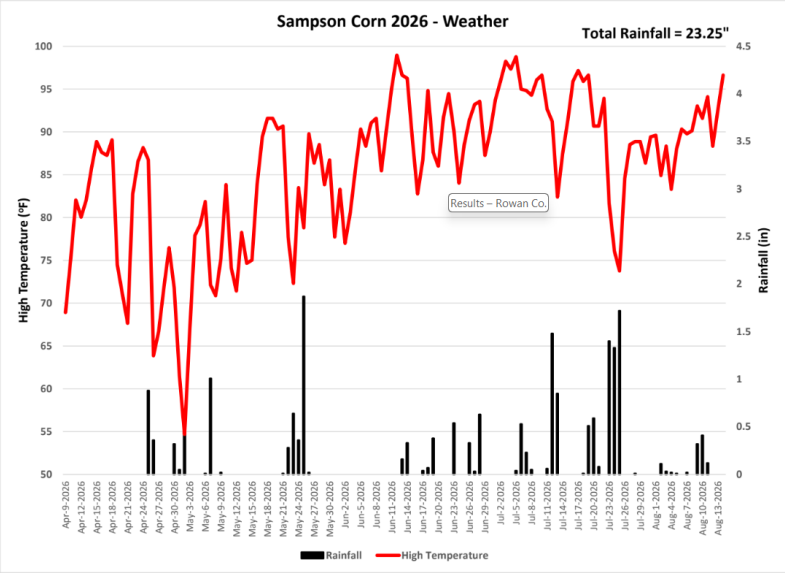



**Figure 5.** Corn yield (bu/acre) and net return ($/acre) as an effect of nitrogen rates (lbs N/acre)

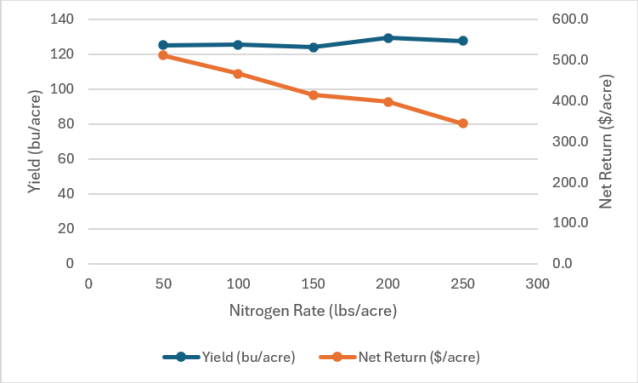
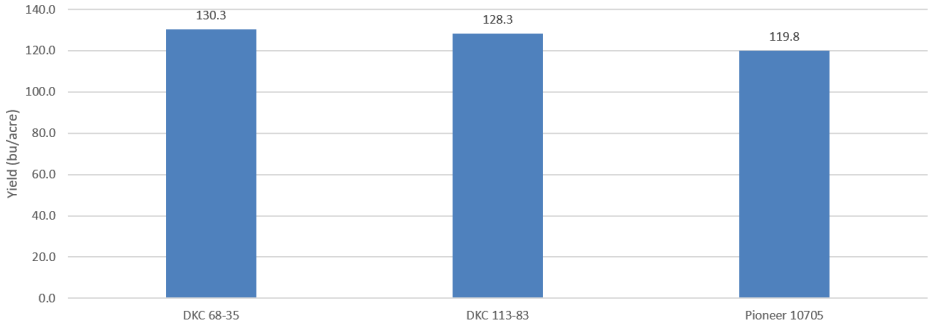



**Figure 6.** Corn yield (bu/acre) as an effect of corn hybrids.



## 2.6 Yadkin Co.

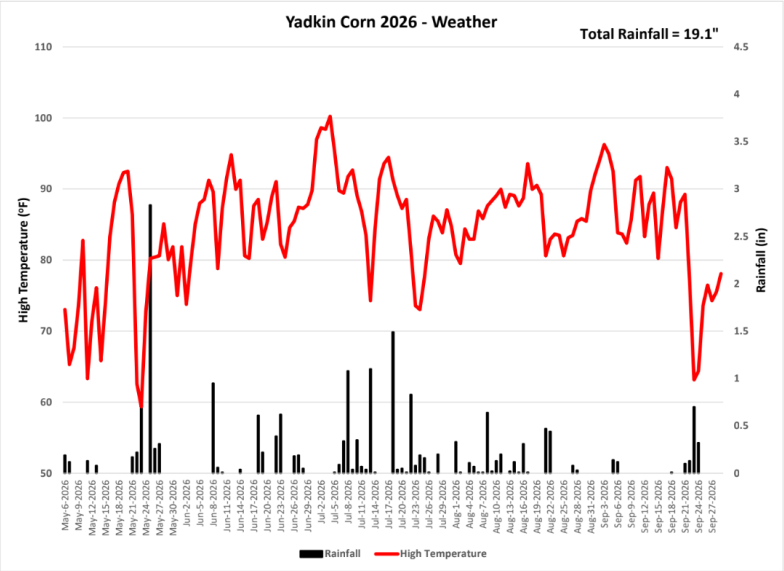
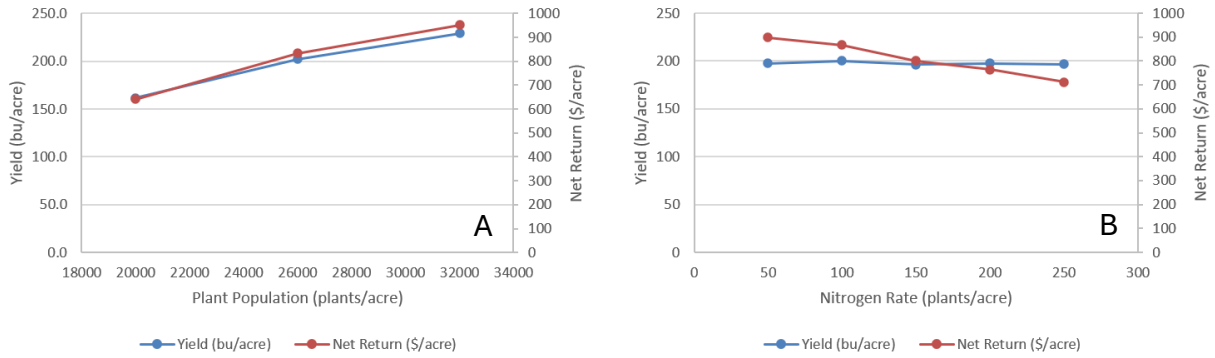



**Figure 7.** Corn yield (bu/acre) and net return ($/acre) as an effect of plant population (A) and nitrogen rate (B).




## ACKNOWLEDGEMENTS

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