# EFFECT OF N RATE ON FORAGE YIELD OF LATE SUMMER PLANTED JERRY OAT

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## INTRODUCTION

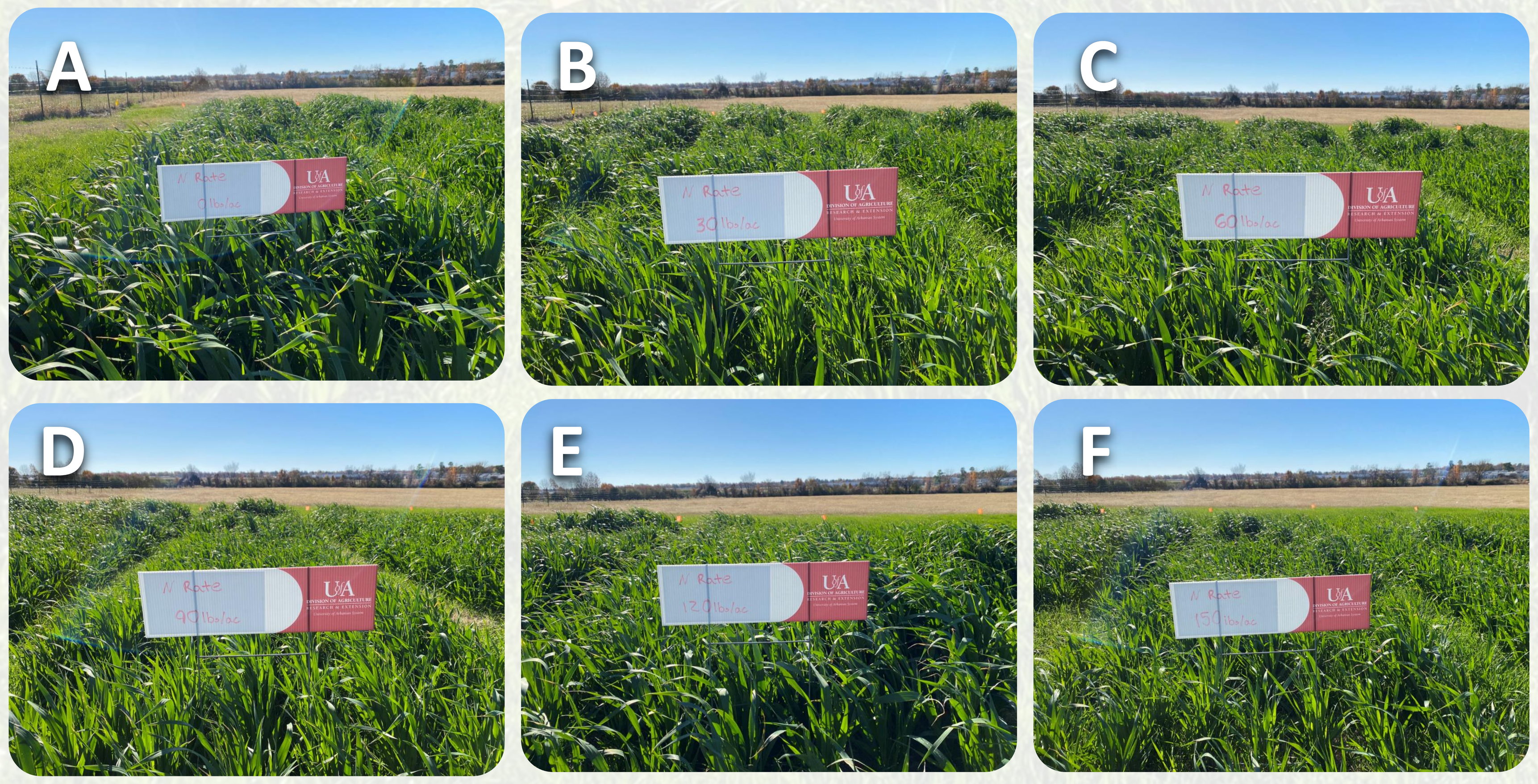
As temperatures transition from a warm summer to a cool fall/winter, warm-season forage growth slows, and cool-season forage growth increases. This transition period can result in gaps of inadequate forage grazing seasons. Planting winter annuals late in the summer as warm season growth slows can provide ample forage to help fill these gaps in the grazing period.

## OBJECTIVE

To determine the optimum nitrogen (N) application rate for forage biomass production of late summer planted Jerry Oats.

## MATERIALS & METHODS

- Jerry oats were planted on September 12, 2023, at 100 lb. seed acre$^{-1}$ using a Great Plains 606 No-till drill.
- Nitrogen applications were made by hand at planting using Urea (46-0-0):
  - 0 lb N acre$^{-1}$
  - 30 lb N acre$^{-1}$
  - 60 lb N acre$^{-1}$
  - 120 lb N acre$^{-1}$
  - 150 lb N acre$^{-1}$
- 120 lb $P_2O_5$ acre$^{-1}$ and 150 lb $K_2O$ acre$^{-1}$ were also applied to prevent yield limitations and monitor N nutrient impact only.
- Harvested on December 5, 2023, at a 3-inch harvest height by mowing and collecting the biomass.
- Forage biomass was weighed, and sub-samples were collected for moisture and nutritive value analysis.




Pictures of oat nitrogen rate treatments on the day of harvest (12/5/23). A: 0 lb N ac$^{-1}$, B: 30 lb N ac$^{-1}$, C: 60 lb N ac$^{-1}$, D: 90 lb N ac$^{-1}$, E: 120 lb N ac$^{-1}$, and 150 lb N ac$^{-1}$.

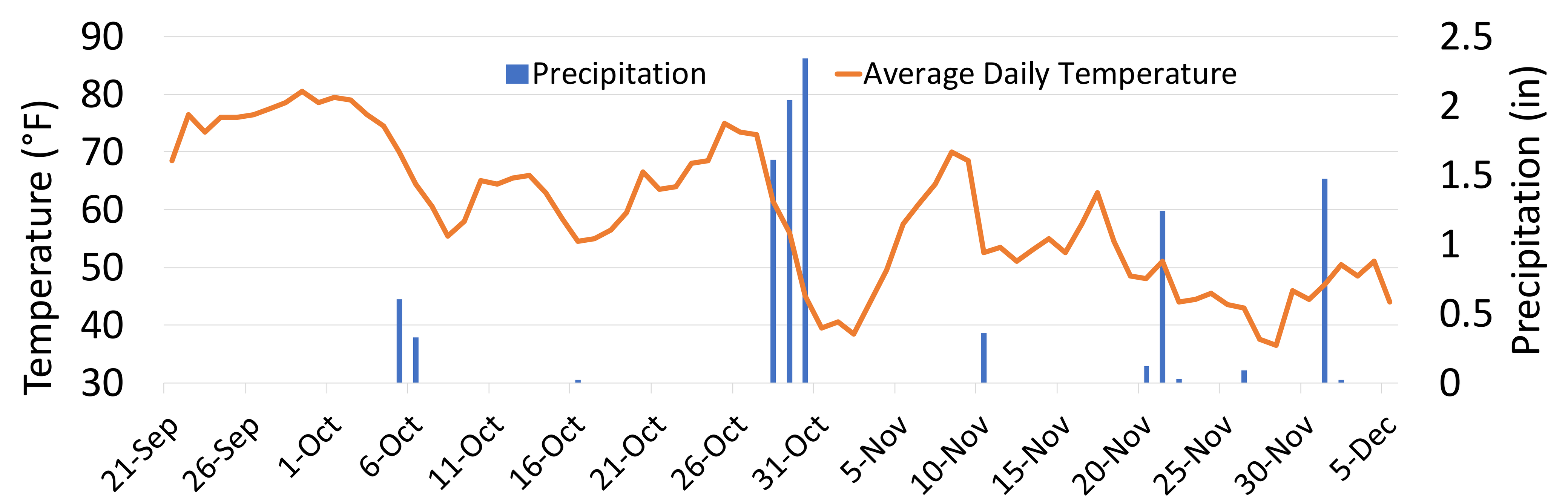



Figure 1. Average daily temperature (°F) and Daily Precipitation (in) over the oat growing period (September 21 – December 5)

## RESULTS

- Forage yields were not influenced by nitrogen application rate ($p = 0.5126$), averaging 1491 lbs. DM acre$^{-1}$.
- Forage canopy height was not significantly increased by increasing the amount of N applied at either sampling date ($p = 0.3193$; $p = 0.6214$).
- However, the application of N did result in a numerical increase of forage canopy height 40 days after planting by the application of 60 lb N acre$^{-1}$ or more.
- Canopy closure measured on the day of harvest was not influenced by nitrogen application ($p = 0.8392$) and averaged 72% canopy closure.
- The average daily temperature over the oat growing period was 59 °F with cumulative precipitation of 10.3 inches.
- A 14-day dry period of no precipitation, with an average daily temperature of 76°F followed the nitrogen application.

| Nitrogen Rate (lb N acre$^{-1}$) | Canopy Height (inches) | | Canopy Closure (%) | Dry Matter (lb DM acre$^{-1}$) |
|---|---|---|---|---|
| | 10/23 | 11/29 | | |
| **0** | 5.9 | 13.3 | 76 | 1528 |
| **30** | 5.2 | 12.4 | 70 | 1489 |
| **60** | 6.5 | 12.4 | 76 | 1632 |
| **90** | 6.3 | 11.3 | 70 | 1394 |
| **120** | 6.3 | 12.3 | 76 | 1502 |
| **150** | 6.5 | 11.8 | 70 | 1398 |

## CONCLUSION

The lack of rainfall in the 14 days following nitrogen application resulted in limited incorporation of N into the soil leaving the Urea susceptible to volatilization in the ideal conditions of >75 °F. Two precipitation events cumulating 0.9 inches followed the 14-day dry period, incorporating any remaining N. This period was followed by a 20-day dry period with an average temperature of 65 °F, limiting the growth of oats and reducing the amount of applied N taken up. The growth-limiting conditions observed in the first month of this trial resulted in a lack of response of Jerry oats to nitrogen application. This data represents a single growing season of an ongoing study

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