

Management of Dual-Purpose Wheat Varieties in the Southeastern U.S.

M. H. West¹, M. K. Mullenix¹, A. N. Rabinowitz², W. B. Smith¹, and S. L. Dillard¹

¹Department of Animal Science, Auburn University, Auburn AL

²Department of Agricultural Economics and Rural Society, Auburn University, Auburn AL



Introduction

- Dual-purpose wheat systems improve established cropping rotations by diversifying on-farm income.
- These systems are popular in the Southern Great Plains region but are underutilized in the Southeast.
- Dual-purpose wheat has the potential to be incorporated into established cropping rotations of the Southeast.
 - Provide additional flexibility in on-farm decision making.

Experimental Design

- Randomized Complete Block Design
 - 4 replicates (n = 4)
 - 3 grazing treatments
 - No Grazing (NG), Low Frequency (LF) and High Frequency (HF)
 - 4 wheat varieties
 - AGS 2024, Pioneer 26R41, Generic Feed Wheat, and GA Gore ('Seed')

Methods

- 12-30' × 30' plots were delineated with electric fencing
- Plots were established at 120-lb PLS/A
- Plots were fertilized with 120-lb/A N and 40-lb/A P and K to soil test recommendations
- 25 cow-calf pairs were used to mob-graze plots at 4-week intervals
- At each grazing, 3 – 1.1 ft² before grazing (Pre-G) and after grazing (Post-G) destructive forage samples were taken.
- Samples were dried at 113°F for 72 h at the Auburn University Forage Lab.
- Near Infrared Spectroscopy was utilized to determine total digestible nutrients, neutral detergent fiber, acid detergent fiber and crude protein.
- Data were analyzed using Proc GLIMMIX of SAS 9.4 (SAS Institute, Cary, NC), $\alpha < 0.05$.



Acknowledgements

Support for this project was provided by USDA-NIFA Hatch Project ALA013-1-18019 and USDA-NIFA SSARE LS19-310. Support for this project was also provided by Chris Parker and staff from the Wiregrass Research and Extension Center (WREC) in Headland, AL. Additional photo credits to Maggie Justice.

Figure 1: Year 1 Final Grain Yield of Dual-Purpose Wheat Varieties Managed Under Varying Grazing Frequencies.

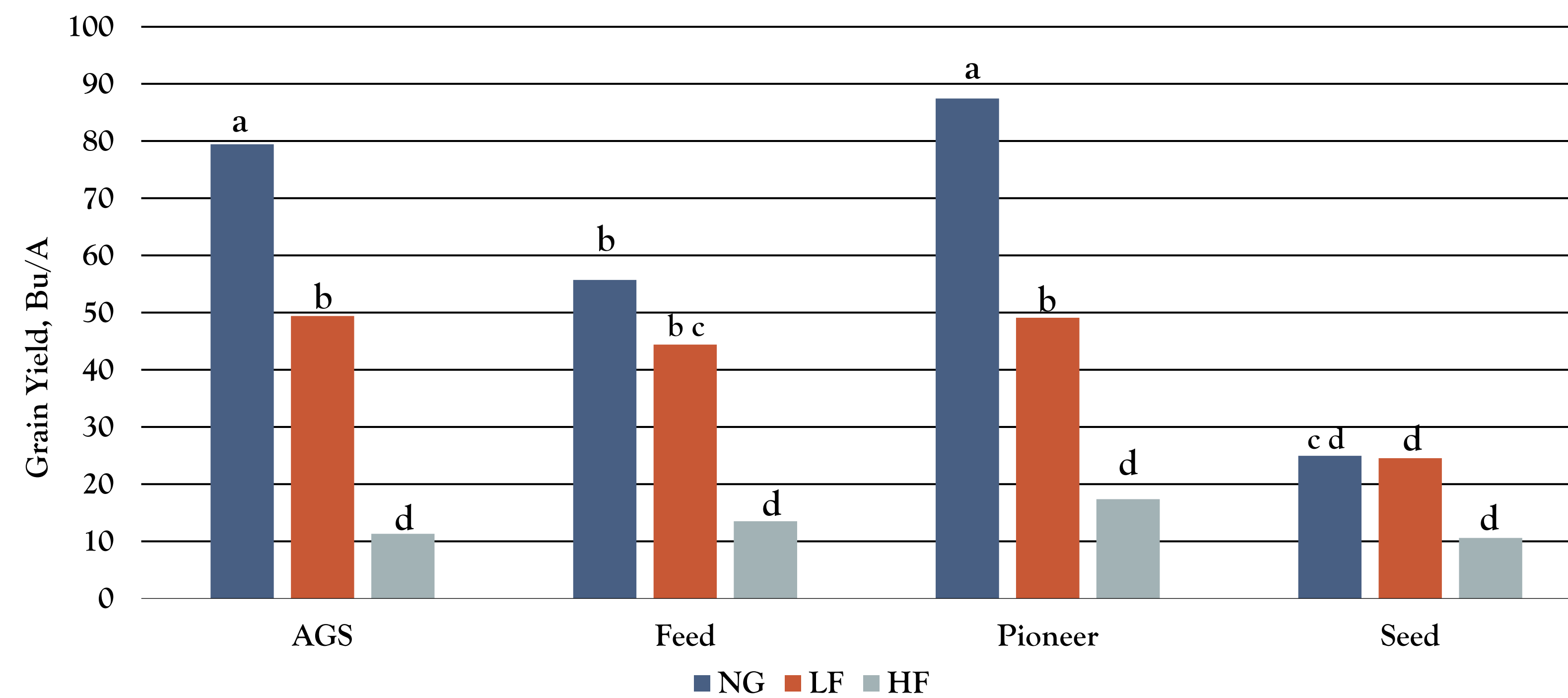


Figure 2: Year 2 Final Grain Yield of Dual-Purpose Wheat Varieties Managed Under Varying Grazing Frequencies.

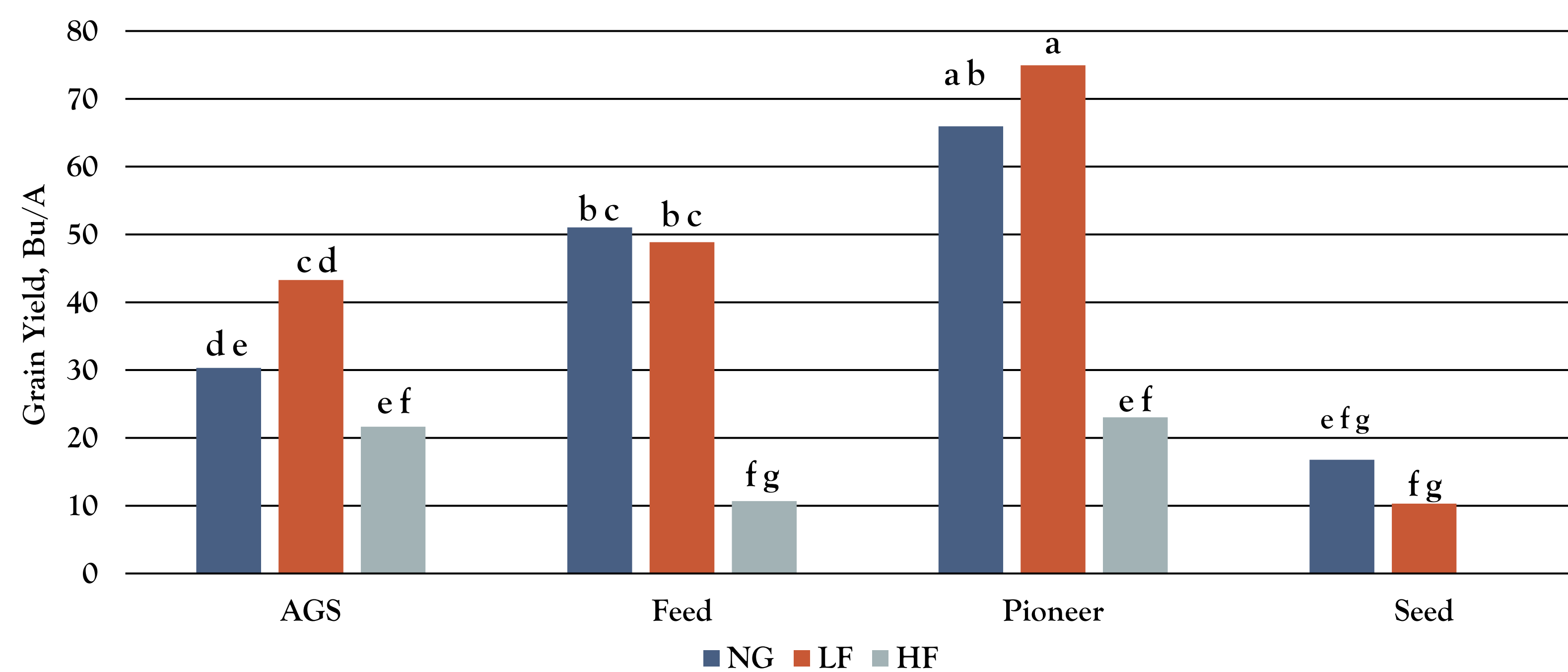
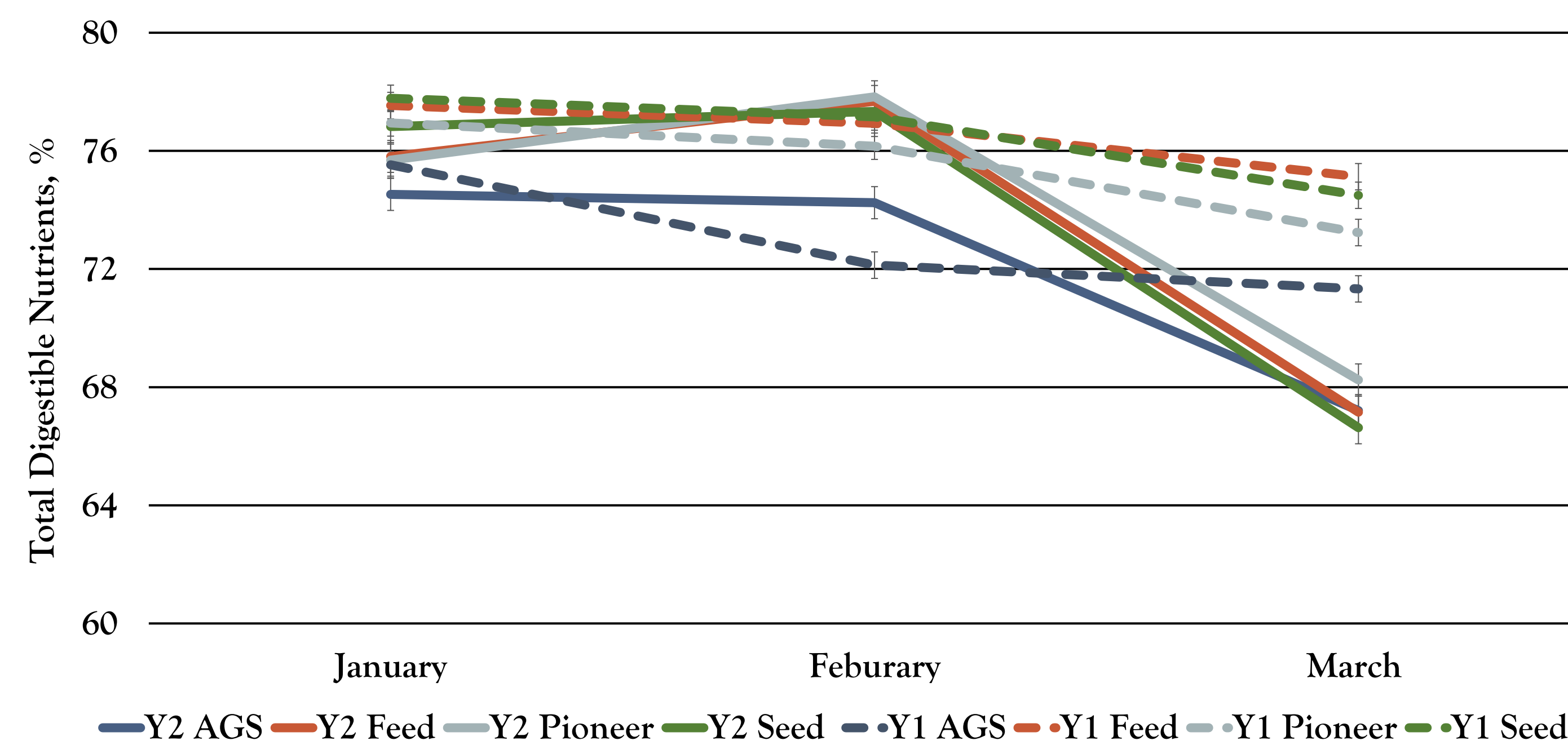


Figure 3. Total Digestible Nutrients of Four Dual-Purpose Wheat Varieties for Two Consecutive Years.



Results

Forage Yield

- Year 1 Pre-G AGS forage yield was greater ($P < 0.01$) than all other varieties (1,390 lb/A vs. 944 lb/A, respectively).
- Year 2 Pre-G forage yield was greatest for AGS and Feed ($P = 0.32$) compared to all other varieties (3,203 lb/A vs. 2,561 lb/A, respectively).

Forage Quality

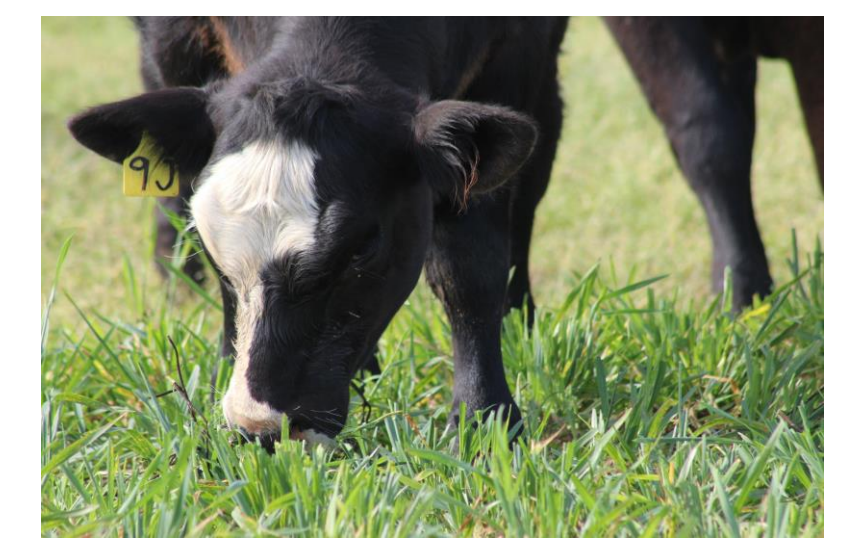
- Feed, Seed and Pioneer had greater ($P < 0.01$) crude protein (CP) than AGS for Year 1 (31.6 vs. 30.1%, respectively).
 - Grazing frequency did not affect CP values for Year 1 or Year 2 ($P = 0.65$ and $P = 0.61$, respectively).
- Year 1 concentration of NDF was greatest for AGS (39.1%) compare with all other varieties (34.9%, $P < 0.01$).
- NDF concentrations were greatest ($P = 0.93$) for AGS and Feed in Year 2 (51.7%).

Grain Yield

- Pioneer, in Year 1, had the greatest grain yield but was not different from AGS (51.3 Bu/A vs. 46.7 Bu/A, respectively; $P = 0.41$).
 - Seed had the least grain yield for Year 1 (20.0 Bu/A, $P < 0.01$) and Year 2 (9.03 Bu/A, $P < 0.01$).
- Grazing frequencies were significantly different ($P < 0.01$) for Year 1 and Year 2.
 - NG being the greatest (61.9 Bu/A) and HF being the least (13.2 Bu/A) for Year 1.
 - However, Year 2 grain yield was greatest for the LF treatment (44.4 Bu/A, $P < 0.01$).

Conclusions

- Dependent on variety, LF grain yields were competitive with NG yields in Years 1 and 2.
- Forage-type varieties can produce competitive grain yields.
- High forage quality allows for maintenance grazing for cow-calf herds (60 -70% TDN, 15-20% CP) and potential gains for stocker herds.
- Seed-type wheat varieties may not be a viable option for the Southeast.



Literature Cited

- Redmon, L. A., G. W. Horn, E. G. Krenzer Jr, and D. J. Bernardo. 1995. A review of livestock grazing and wheat grain yield: Boom or bust? *Agronomy Journal* 87(2):137-147.
- Arzadun, M. J., J. I. Arroquy, H. E. Laborde, and R. E. Brevedan. 2003. Grazing pressure on beef and grain production of dual-purpose wheat in Argentina. *Agronomy Journal* 95(5):1157-1162.
- Edwards, J., B. Carver, G. Horn, and M. Payton. 2011. Impact of dual-purpose management on wheat grain yield. *Crop Science* 51(5):2181-2185.