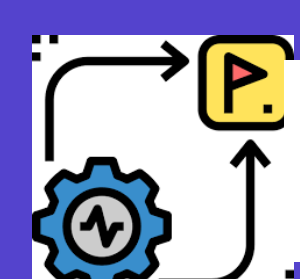




1. Introduction

Nitrogen (N) and Sulfur (S) are essential nutrients for silage corn yield and nutritive value. Nitrogen fertilization is usually split during the vegetative growth of corn and S is usually dosed through N sources. Timing N fertilization during vegetative phase of corn could reduce S's impact on yield and nutritive value, as half of S's uptake by plants occur after tasseling (Kaiser and Vetsch, 2022). We **hypothesized** that applying gypsum at tasseling might positively interact with the N-only source applied during the vegetative growth of silage corn, to increase yield and nutritive value. The **objective** was to assess the yield and nutritive value of pre-ensiled corn fertilized with increasing doses of N, with or without gypsum as S source at tasseling.



2. Materials and methods

- **Site.** Plant Science Research and Education Unit (PSREU) in Citra, FL.
- **Treatments.** Combination of 3 N rates with or without S at tasseling (Figure 1).
- **Experimental design.** Complete randomized block design with 5 replicates.
- **Plots.** Thirty of 10 × 20 ft with four rows each (30 inches width).
- **Measurements.** Yield, nutritive value, milk production potential.
- **Data Analysis.** The N rate, S rate, the N x S interaction and block, were considered fixed effects. $\alpha \leq 0.05$.

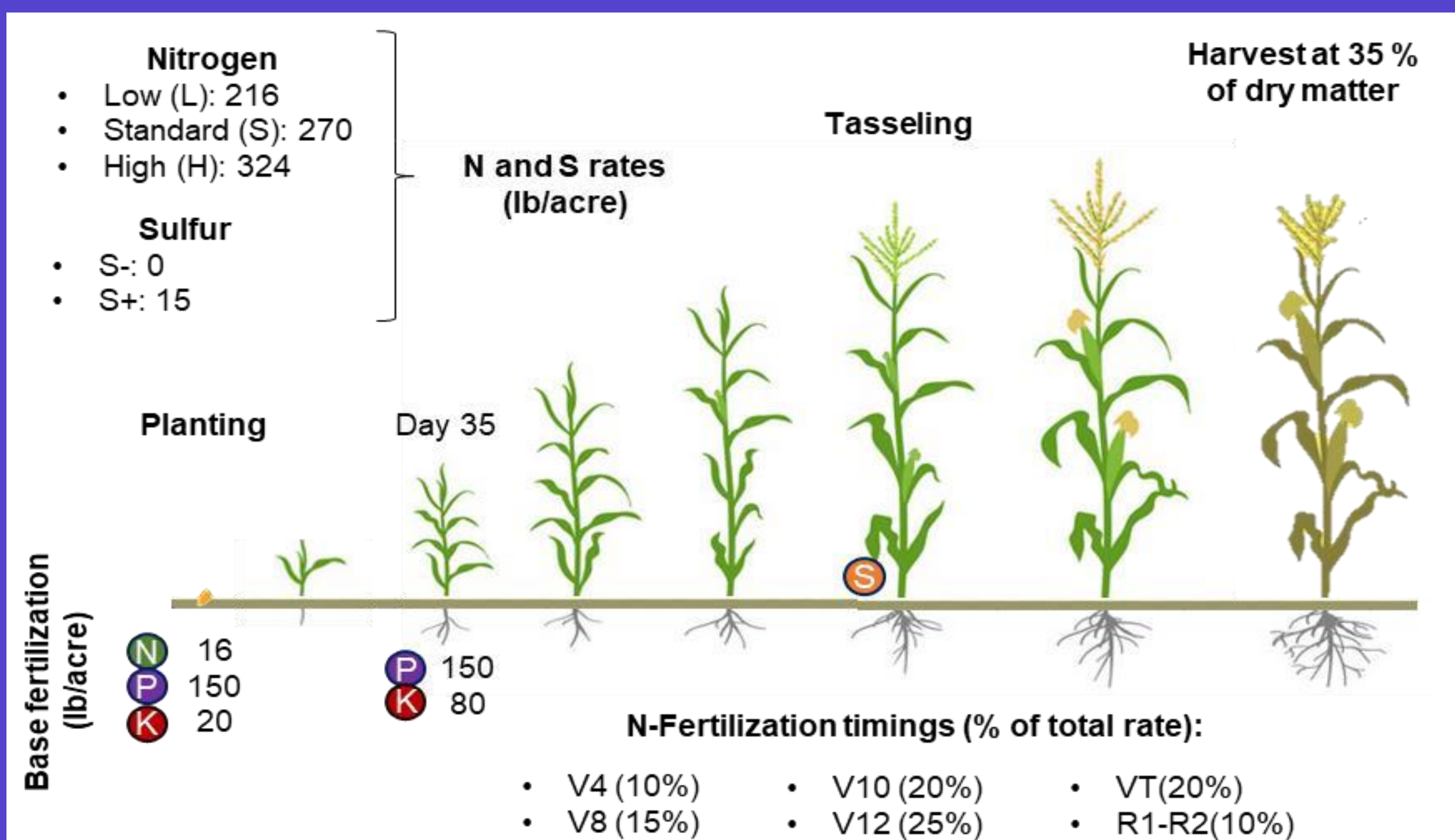


Figure 1. Schematic representation of treatments and base fertilization.



3. Results

Table 1. Nutritive value and milk yield potential of silage corn fertilized with Nitrogen and Sulfur at variable rates in a sandy soil of North Florida.

Variable	S-						S+						P-Value		
	L	± sd	S	± sd	H	± sd	L	± sd	S	± sd	H	± sd	N	S	N*S
Crude protein	7.59	0.39	8.01	0.7	7.87	0.34	7.47	0.55	7.95	0.34	8.06	0.33	0.076	0.99	0.732
Acid detergent fiber	19.2	1.11	19.4	0.5	19.6	1.91	19.6	1.83	19.2	2.59	20.1	3.08	0.814	0.748	0.885
aNDF, %	36.4	1.85	36.2	1.43	36.2	2.71	36.6	3.09	36.4	3.17	36.3	3.09	0.979	0.872	0.997
Lignin, %	2.44	0.29	2.31	0.17	2.34	0.5	2.25	0.37	2.35	0.26	2.36	0.32	0.991	0.692	0.686
WSC, %	10.8	0.77	10.6	0.68	10.7	0.9	10.6	0.39	10.5	0.32	10.4	0.33	0.728	0.342	0.94
Starch, %	33.4	3.16	33.5	3.81	33.4	3.81	34.1	5.09	33.2	1.94	33.7	3.37	0.974	0.837	0.949
TDN, %	76.8	1.78	77	1.51	76.9	1.25	77.4	0.98	77.8	0.38	77.1	1.36	0.776	0.255	0.814
Milk yield, t/acre	3,741	172	3,743	161	3,752	166	3,767	99	3,811	81	3,780	154	0.94	0.444	0.931

S-: 0 lb/acre of S; S+: 15 lb/acre of S; L: low N; S: standard; H: high N; CP = crude protein; ADF= acid detergent fiber; aNDF=neutral detergent fiber; WSC= water-soluble carbohydrates; TDN= total digestible nutrients. N= effect of Nitrogen; S= effect of Sulfur; N*S= interaction effect

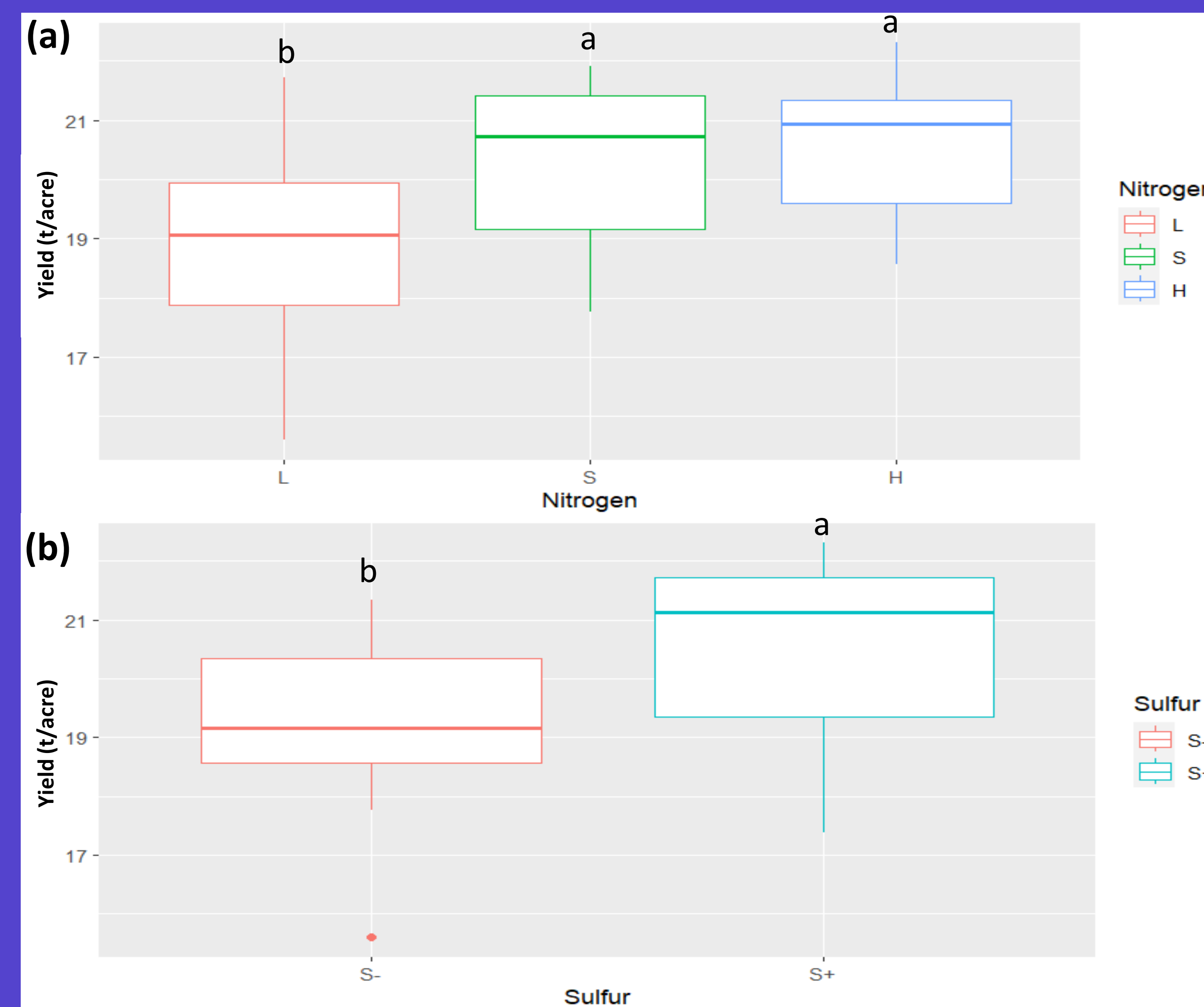


Figure 2. Principal effects of N (a) and S (b), on silage corn yield in a sandy soil of North Florida.



4. Preliminary conclusion

Yield of silage corn planted in a sandy soil of North Florida increased with both N and S fertilization. Nutritive value was not affected by either element, although higher N rates tended to increase crude protein content of pre-ensiled corn. Milk yield potential was not affected by N or S fertilization.



5. References

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- Kaiser, D.E., and Vetsch, J.A. 2022. Sulfur for Minnesota soils. University of Minnesota Extension. <https://extension.umn.edu/micro-and-secondary-macronutrients/sulfur-minnesota-soils/>.