

Breaking the Surface on Strip-till Feasibility in Randolph County

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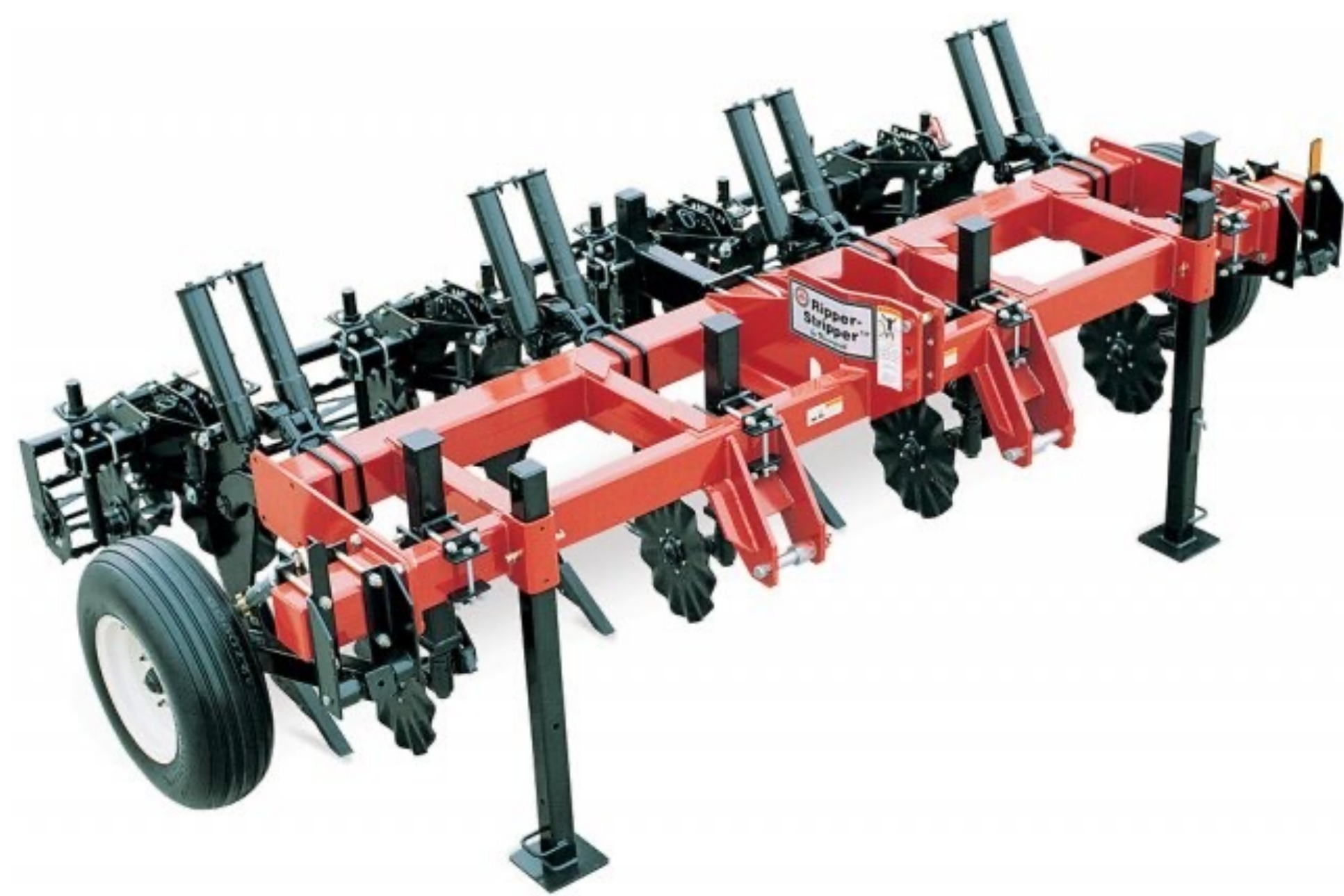
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Introduction

Long term no-till practices have left producers competing with compaction on the heavy clay soils commonly found in Randolph County, NC. One producer in particular was interested in adding strip-tillage into his production practices. The equipment needed to make this transition is expensive, and there is not a lot of data to suggest it would be economically justifiable. We identified a field that had a hardpan from 2 inches to 8 inches below the soil and has been in no-till for over 20 years.

Research Hypothesis

Strip-tillage treatments will allow roots to grow deeper and allow the plant to capture moisture and nutrients more efficiently than the no-till treatments, therefore increasing yield.



Research Objectives

Determine if the added costs of purchasing and using a strip-till implement is economically justifiable based on the potential impact on yield as compared to a no-till system.

Materials and Methods

A replicated strip trial was designed with two treatments, planting using a no-till planter and planting with the same no-till planter into the strip-tilled rows. The strip-till implement used was an Unverferth 332 Ripper-Stripper. Soil compaction was measured and the hard pan depth was determined using a soil penetrometer.

Production information

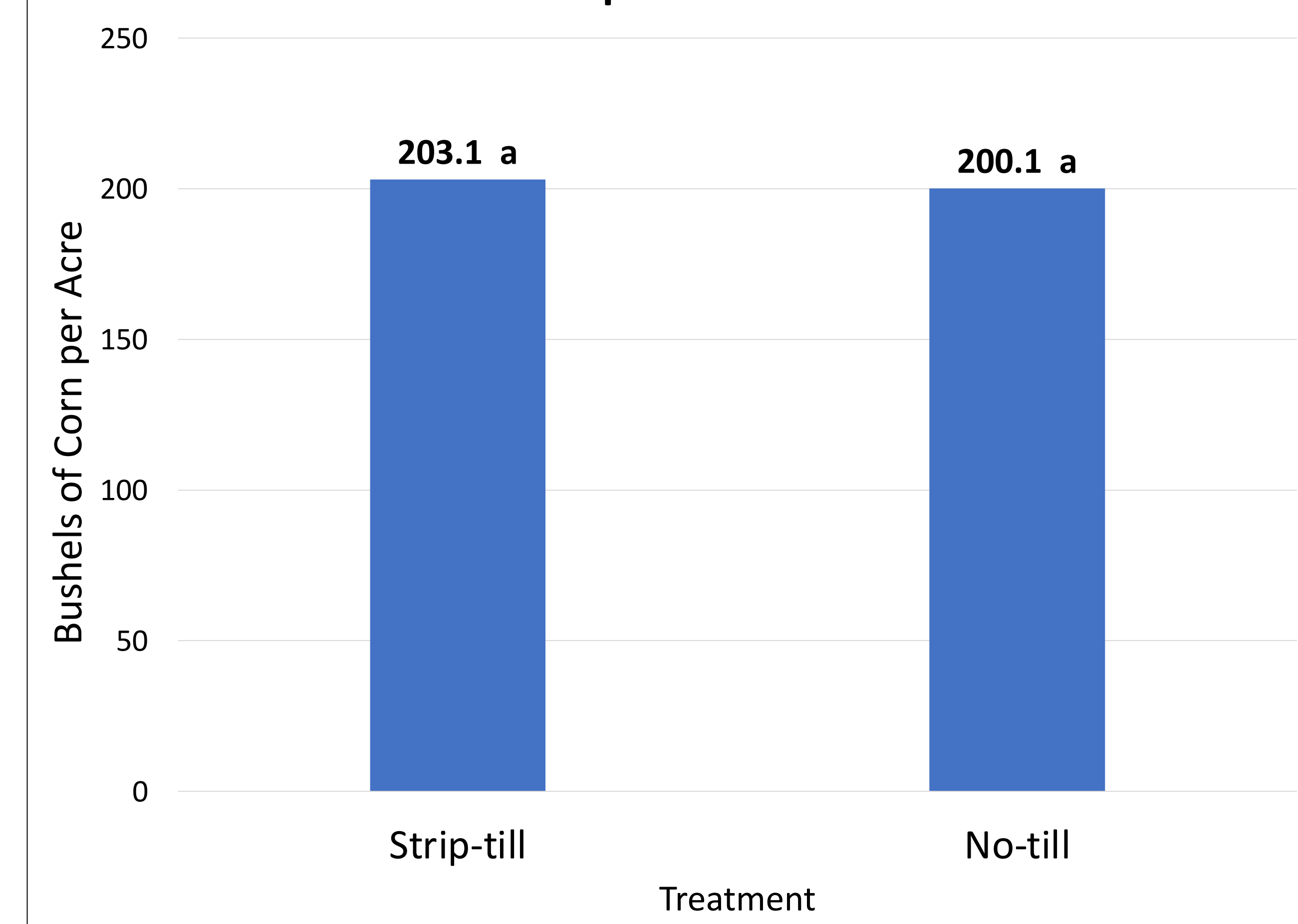
- Non-irrigated
- 27,500 plants per acre
- 30 inch rows
- Planted: 4/19/23
- Harvested: 10/6/23
- Soil type: BaB—Badin-Tarrus complex
 - Ap - 0 to 6 inches: silt loam
 - Bt - 6 to 24 inches: clay



Results

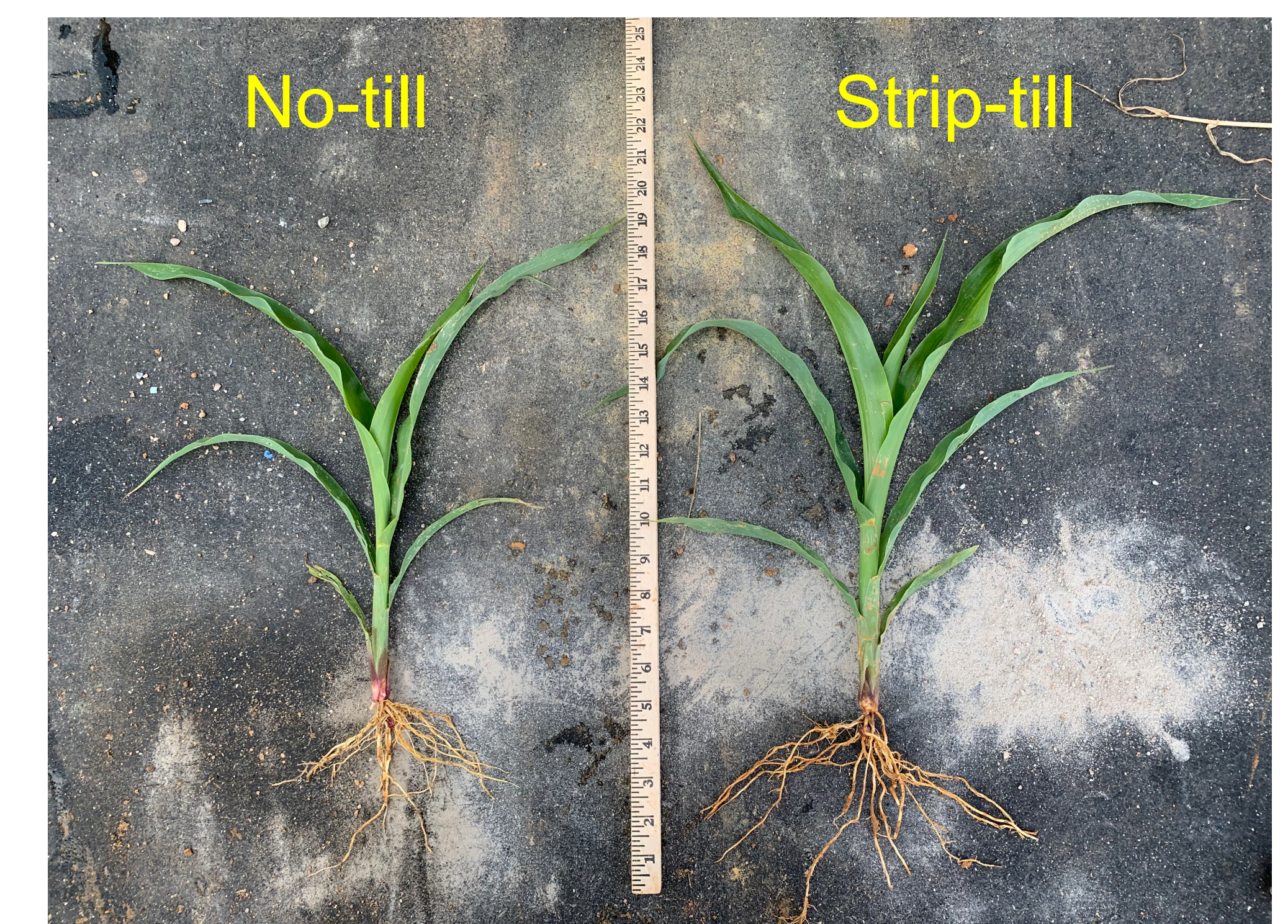
No statistically significant yield benefits were observed from the strip-till treatment as compared to the no-till treatment (Table 1). The plants in the strip-till treatments were visibly taller and had deeper roots early in the season. The strip-till implement broke through the hardpan from 2 inches to 6 inches. This location had significant rain shortly after planting followed by drought conditions later in the year. This resulted in moderate variability within the trial.

Table 1. 2023 Strip-till v. No-till Trial Yield



Conclusions

Long term no-till systems have been known to cause compaction issues (Hamza and Anderson, 2005). While strip-tillage seemed to increase the health of the crop early season, it did not result in a yield benefit at harvest and therefore couldn't be economically justified. More environments are needed to fully test the feasibility of strip-till practices in the Piedmont of North Carolina.



References

1. M.A. Hamza, W.K. Anderson; Soil compaction in cropping systems: a review of the nature, causes and possible solutions; Soil Till. Res., 82 (2005), pp. 121-145