

# Assessing the impacts of tillage and cover crop management on soil water content



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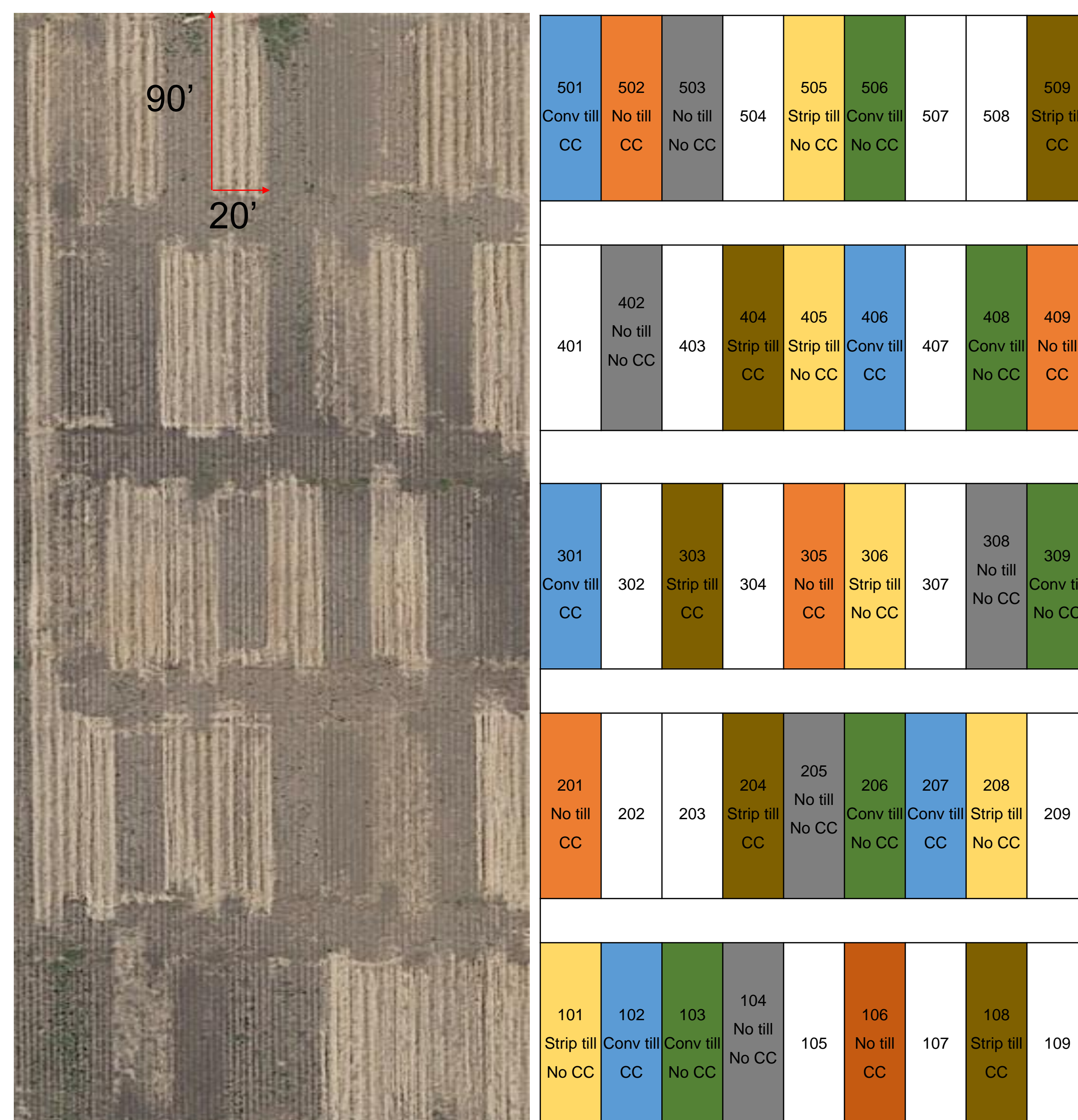
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## Introduction

- Conservation tillage and the use of cover crops appear to hold promise for limiting soil erosion and enhancing soil water conservation
- Quantifying cover crop and tillage impacts on soil water dynamics is important to understand how they may influence subsequent corn or soybean performance

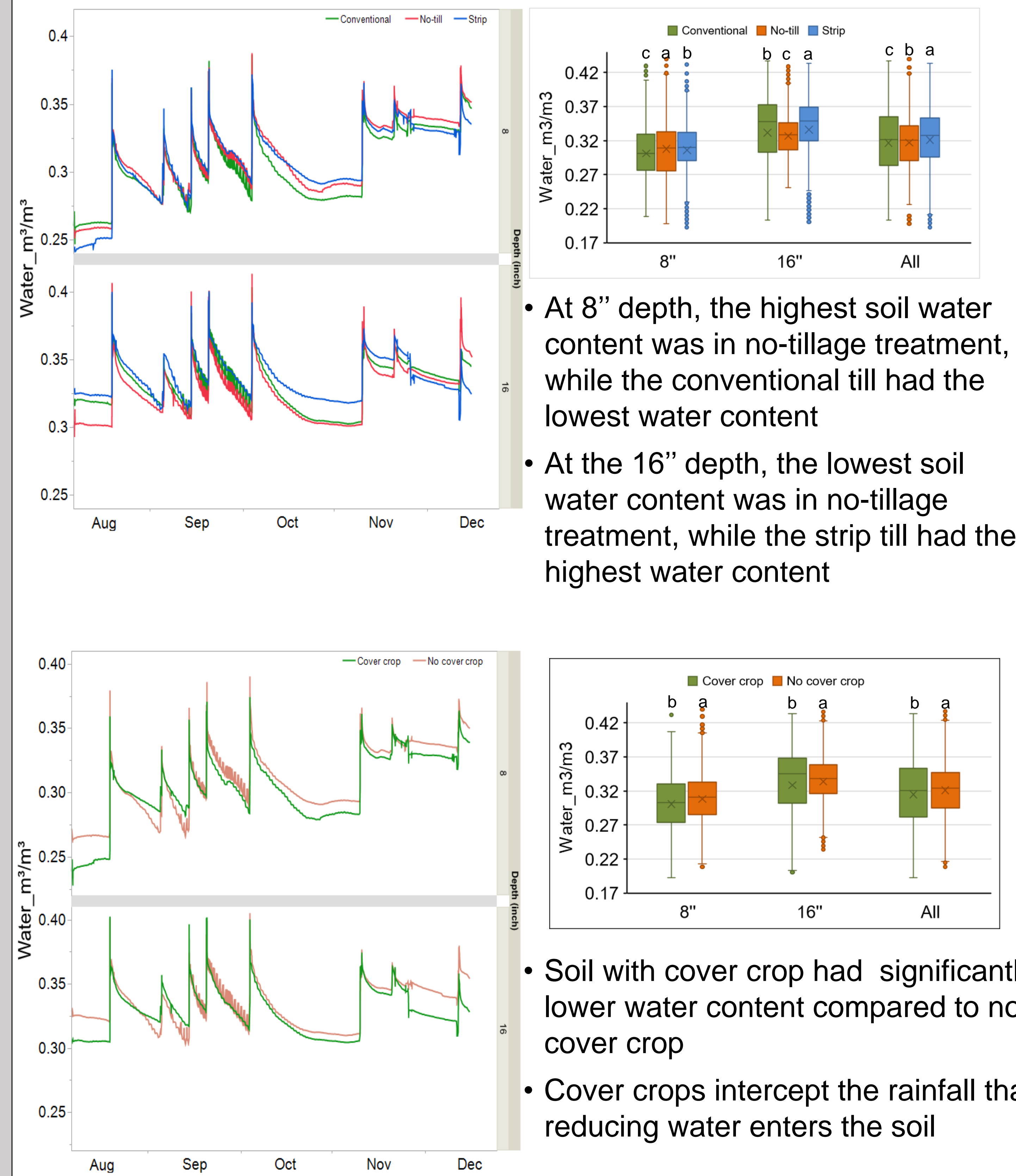
## Methods

- Corn-soybean rotation field in Urbana, IL
- Typic Endoaquolls, silty clay loam, poorly drained
- 3 x 2 full factorial design
  - tillage (conventional tillage, strip tillage, no-tillage)
  - cereal rye cover cropping (with and without)
- TEROS 12 sensors installed for continual in-situ monitoring water content ( $m^3/m^3$ ) and temperature at 8" and 16" depths **every 15 min**
- Two-way ANOVAs estimate how the soil water content and temperature changes according to different treatment of tillage and cover crop.

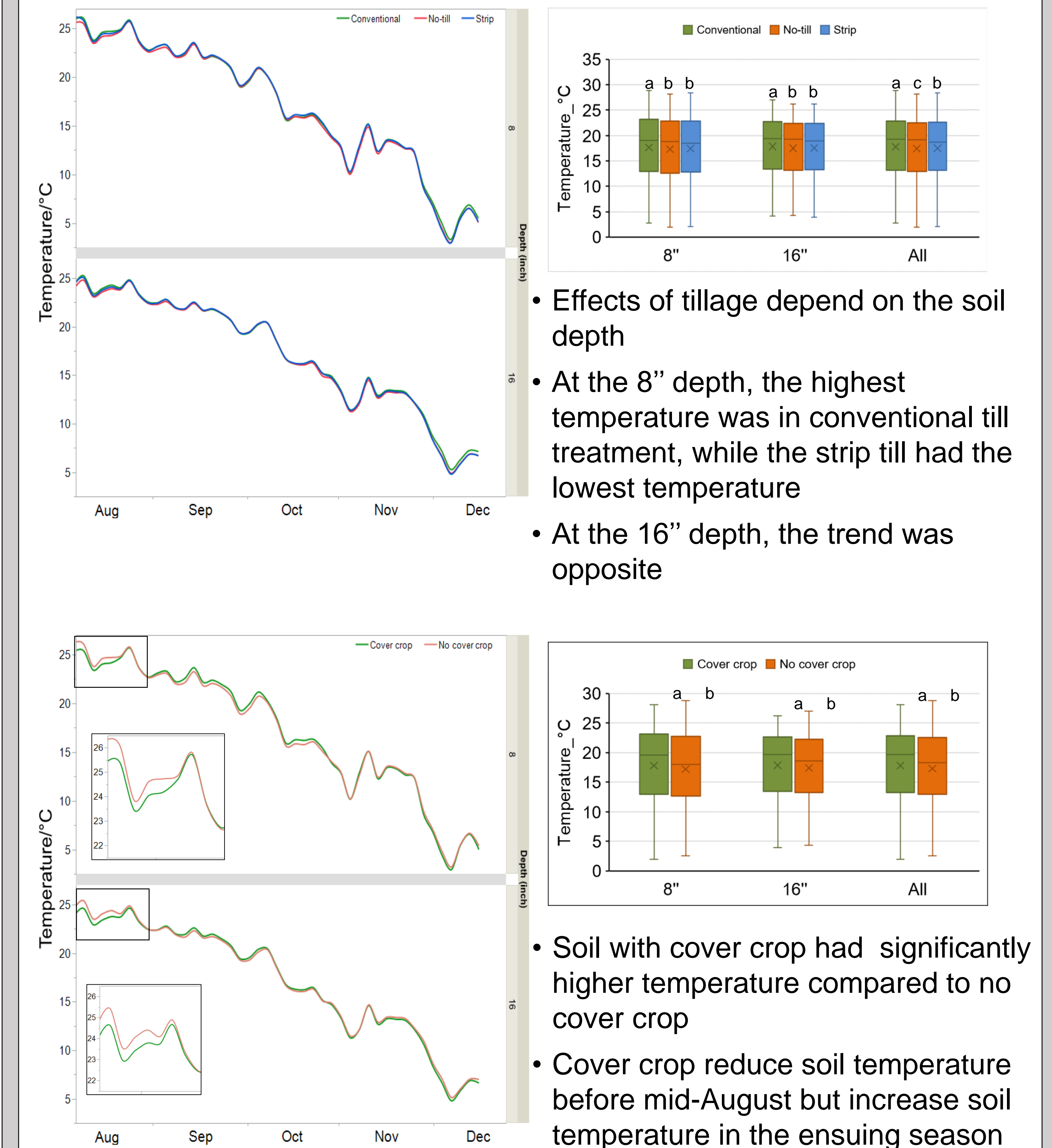


•Study field  
•Trial design  
•Terost12 installation

## Results: Soil water content dynamics



## Results: Soil temperature dynamics



## Highlights

- Moisture sensors installed in the root zone provide fine-scale insights to soil water and temperature dynamics
- Tillage and cover crop significantly influenced the soil water content and temperature at both depths.
- No-tillage treatment retained highest soil water content and the lowest temperature at 8" depth, but this treatment had the lowest soil water content at 16" depth.
- Soil with cover crop had significantly lower water content and higher temperature compared to no cover crop throughout the ensuing growing season
- No-tillage and cover cropping can benefit poorly drained soils in wet springs by reducing soil water content into the ensuing growing season, though in dry years this could potentially compromise crop water availability.

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