Assessing Cover Crop Strategies in Corn Production under Different Tillage Practices

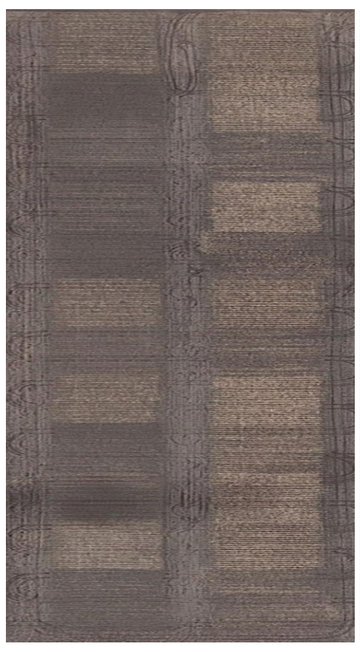
UNIVERSITY OF MINNESOTA EXTENSION

MinnesotaCorn

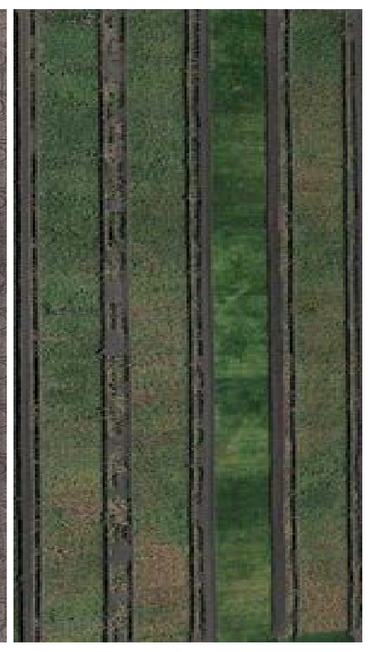
Introduction

While excessive tillage can cause soil erosion, leading to nutrient enrichment and turbidity of water bodies, no-tillage retains high amount of previous season crop residue, challenging corn productivity and residue management.

Cover crops can help reduce soil erosion, nutrient leaching, promote crop diversification and provide ground cover in tilled soils. This study addresses the viability of cover crop strategies and impact of different tillage practices in corn-soybean production systems in Minnesota.



Waseca

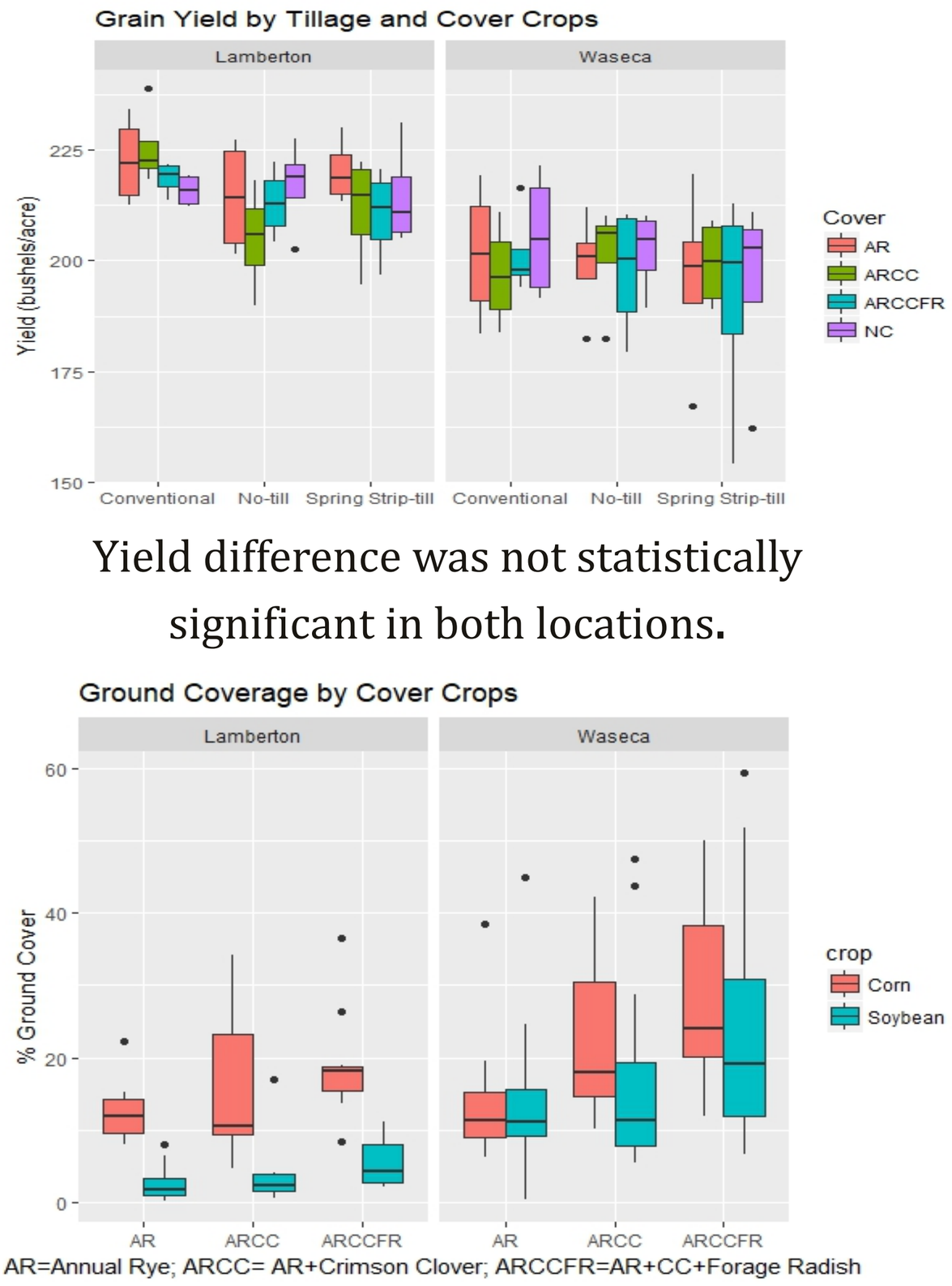


Lamberton

Experiment

- Locations: Lamberton and Waseca
- Tillage practices: Conventional-, strip-, and no-till
- Treatments: Annual Rye (AR), [AR+ Crimson Clover (CL)], [AR+CL+ Tillage Radish (TR)], and No Cover (NC)
- Data collected:
  1. Soil samples at 0-15 cm and 15-30 cm depth before planting cover crops, before 1st frost and before planting corn.
  2. Phenology, LAI and plant biomass at 5 growth stages, CC biomass and ground biomass before 1st frost.
  3. NO_3-N in leachate with ceramic cup lysimeters and N in plant.
  4. Soil moisture and soil temperature using 5TM sensors.
  5. Yield using a combine with yield monitoring device.

Early Results

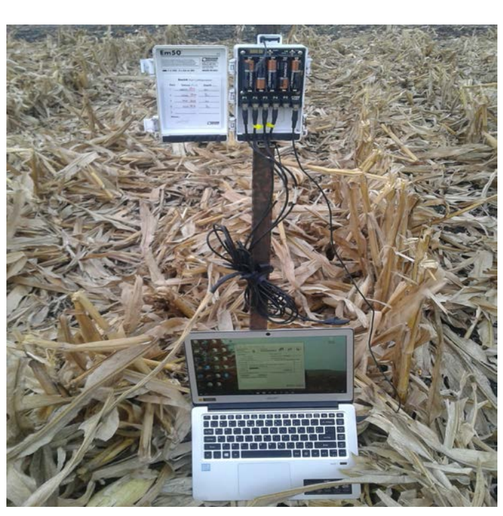


Yield difference was not statistically significant in both locations.

Ground coverage was more in corn than soybeans, and in WA than LA.

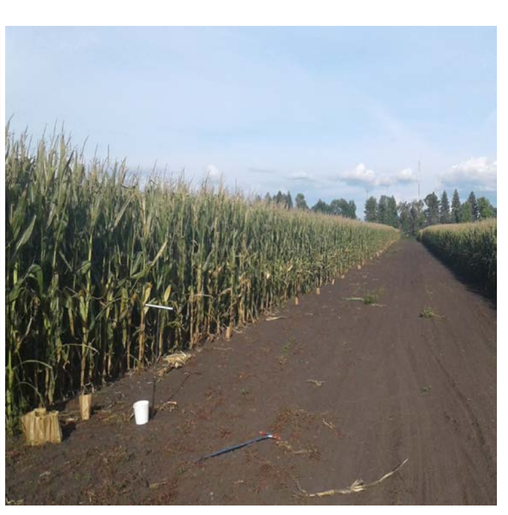
Cover crops at corn physiological maturity

Crop residue from last season in NT plots



EM50 Datalogger: Downloading soil moisture and temperature data

Preparing plant samples for lab analysis



Collecting soil samples for lab analysis

Find out more at: http://www.mncorn.org/research/agronomy-and-plant-genetics/

Rabin KC & Axel Garcia y Garcia.

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