

# Tillage Tools for Corn Residue Management

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## Objective

The large amount of corn residue left after harvest is challenging for farmers to manage. The objective of this research was to look at the impact of different tillage equipment to manage corn residue on soil seed bed conditions, soybean production the following year, and the time and fuel costs to manage corn residue.

## Treatments

Four corn residue management practices were compared: 1) conventional double disc, 2) vertical till high disturbance, 3) vertical till low disturbance, 4) strip till (Figure 1). The experiments were set up on-farm at three locations in Manitoba (MacGregor, Haywood, Winkler) in 2015 and 2016 for a total of 4 site years. The trials were randomized and replicated in each field. All of the fields volunteered for the on-farm study had sandy soils.

## Measurements

The impact of corn residue management treatments on the soil seed bed and soybean test crop were quantified using measurements of residue cover, soil temperature and moisture, soybean stand establishment, and soybean yield. Fuel consumption and horsepower requirements of the tillage equipment was measured in collaboration with PAMI.

## Significant Findings

- Surface residue cover ranged from 4.4 to 64.4% among residue treatments (Figure 3).
- There were no differences in cumulative daily soil temperature above 10°C for the first 10 days after planting between residue management treatments at any site-year.
- Final soybean plant stands were similar for all residue management treatments in the study (Figure 2). Soybean emergence in the disc treatment was slower for both site years in 2016 due to dryer soil conditions.
- At harvest, soybean grain yield was not significantly different among residue management treatments over all site years.
- An economic analysis calculated total costs for corn residue management treatments to be: double disc (79.70 Can\$/ha), vertical till high disturbance (78.33 Can\$/ha), vertical till low disturbance (73.43 Can\$/ha) and strip till (47.72 Can\$/ha).

## Conclusions

- Results from this study indicate that there are many options for managing corn residue that will allow for the establish a good seed bed for soybean as a subsequent crop in fields with sandy soils in Manitoba. Successful soybean stands were established using the standard practice of double disc and newer tools like vertical till and strip till.
- For corn residue management, strip till as a one pass residue management system showed time and cost saving compared to the other residue management treatments that require two or more tillage passes.

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Figure 1: Four corn residue management practices were compared: 1) conventional double disc, 2) vertical till high disturbance, 3) vertical till low disturbance, 4) strip till



Figure 2: Soybean emergence in corn residue management treatments at all four site years of the study

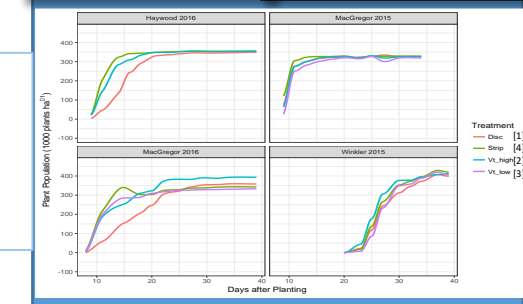


Figure 3: Residue cover and soybeans emerging in corn residue management treatments



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This study would not have been possible without the generosity and dedication of the farmers hosting and collaborating with us on the study.

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