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# Corn Residue Removal Effects on Grain Yield and Soil Quality

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# Corn Residue Removal Effects on Grain Yield and Soil Quality

## **Abstract**

In recent years there has been a greater focus on removing corn residue from fields following harvest. The two main reasons are for use as a low cost feedstuff for cattle production and for future use in cellulosic ethanol production. This leads to the question “What effects will there be from removing corn residue following harvest?” This trial was set up to address potential soil quality concerns as well as look at impacts on grain yield.

## **Keywords**

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## **Disciplines**

Agricultural Science | Agriculture

# Corn Residue Removal Effects on Grain Yield and Soil Quality

## RFR-A9091

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### Introduction

In recent years there has been a greater focus on removing corn residue from fields following harvest. The two main reasons are for use as a low cost feedstuff for cattle production and for future use in cellulosic ethanol production. This leads to the question “What effects will there be from removing corn residue following harvest?” This trial was set up to address potential soil quality concerns as well as look at impacts on grain yield.

### Materials and Methods

This study was established in 2008 to document the impact of residue removal on corn yield and soil quality. The site for this trial is an east-facing slope with a soil type of Monona silt loam with slope ranging from 5–14%. The trial was replicated three times with four treatments of residue removal and fertility variations (Table 1). In plots with residue removed, the residue was baled following a single pass of a spoke-type hay rake after corn harvest. The trial had no fall or

spring tillage and was no-till planted in corn residue from the previous year. A pre-plant burndown herbicide application was used followed with a post-emergence application in mid-June. Grain yield was determined using a yield monitor.

### Results and Discussion

Corn yield response to different residue and fertility treatments showed the effect of residue removal on crop response (Table 2). The effect of residue removal appears to have two effects. These effects are changes in soil environment and nutrients due to residue removal. The statistical analysis showed no differences between yields of all treatments, but removing residue for Treatment 2 showed a yield advantage over no residue removal (Treatment 1). Applying nutrients back where residue was removed appeared to have slightly higher corn yields. The source of nutrients shows a slight difference where manure P and K were slightly better than the commercial P and K source.

### Acknowledgements

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**Table 1. Final plant population, grain yield, and fall stalk nitrate test results from four residue removal and fertility treatments.**

Treatment	Description and fertilizer program. <sup>1,2</sup>
1	No residue removed.
2	Residue removed.
3	Residue removed; P and K applied back as commercial fertilizer based on residue and grain removal.
4	Residue removed; P and K applied back as manure fertilizer based on residue and grain removal and manure P analysis.

<sup>1</sup>A blanket application of 60 lg K<sub>2</sub>O/acre was applied across all treatments in addition to the above described fertility programs. This was to adjust for low soil test K. No blanket application of P<sub>2</sub>O<sub>5</sub> was applied because soil test P was in the high-test category.

<sup>2</sup>Nitrogen application was targeted at 165 lb N/acre. Nitrogen credits were taken for nitrogen in the manure and commercial fertilizer blend.

**Table 2. Grain yield from residue removal and fertilizer treatments.**

Treatment	Grain yield	
	2008	2009
	bu/acre	bu/acre
1	201.8	213.9
2	174.7	243.2
3	204.2	223.7
4	228.5	228.8
LSD <sub>(0.05)</sub>	63.1	22.1