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# Northwest Iowa On-farm Research: Comparing a Soybean No-tillage System

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## **Abstract**

Northwest Iowa on-farm research is now in its fourth year of conducting field scale triple replicated trials. Replication allows for statistical analysis of results. Ideas for on-farm research generally come from the farmercooperators or from the local field agronomist. This project has been established to localize research in northwest Iowa, to help farmers answer some of their crop production questions, and to validate small plot farm research on a whole-field basis.

## **Keywords**

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## **Disciplines**

Agricultural Science | Agriculture

# Northwest Iowa On-farm Research: Comparing a Soybean No-tillage System

**RFR-A9067**

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## Introduction

Northwest Iowa on-farm research is now in its fourth year of conducting field scale triple replicated trials. Replication allows for statistical analysis of results. Ideas for on-farm research generally come from the farmer-cooperators or from the local field agronomist. This project has been established to localize research in northwest Iowa, to help farmers answer some of their crop production questions, and to validate small plot farm research on a whole-field basis.

In 2009, 40 projects were conducted with 20 cooperators from Sioux, Lyon, Osceola, Sac, and Buena Vista counties. Results from all of the projects are located at <http://ofr.ag.iastate.edu>. Comparisons included soybean plant population, tillage versus no-till, soybean row width, soybean field rollers, corn rootworm resistant seed corn with and without insecticide, corn populations, and corn fungicide effectiveness.

This year's article will focus on the comparison of a no-tillage system with the farmer's conventional tillage system in soybeans. Past Iowa State University (ISU) projects have shown no major yield differences in soybeans due to tillage in the loess soils of Northwest Iowa. Unfortunately, many farmers are hesitant to take that first step. Basic on-farm research provides a firsthand opportunity to compare the two types of systems on a farmer's field.

## Materials and Methods

Conventional farm equipment was used to plant and harvest the experiments. Data was collected either by a yield monitor or a weigh wagon. Plots were randomized in a complete block design. Plots were established by using corn rows from the previous growing season. The cooperators matched the no-tillage system to their planter, and disked the tillage treatments. The no-tillage treatments did not receive any tillage since the previous crop year. In situations where the combine header width did not match the planter, the center of each treatment was harvested. Spring stand count, residue percentages, fall stand counts, moisture, and yield data was collected and is shown in Table 1. All studies were conducted on a corn-soybean rotation. Row spacing of 15-in., 22-in., and 30-in. rows were used, depending on the cooperator's equipment at six locations in Sioux and Lyon Counties.

## Results and Discussion

Two of the six trials showed a statistical response favoring the no-tillage soybean treatment. No location showed a statistical advantage to the tillage treatment. This data supports ISU small plot research results. These studies were conducted on loess soils that are internally well drained. Final populations were not impacted due to tillage system differences.

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**Table 1. Comparisons of soybean tillage systems in Northwest Iowa.**

<u>Location</u>	<u>Tillage</u>	<u>Row spacing (in.)</u>	<u>Residue_% (emergence)</u>	<u>Spring stand</u>	<u>Fall stand</u>	<u>Yield (bu/acre)</u>	<u>Significance</u>
Lyon 1	no-till	22	77	127,666	95,000	57.4	**
	conventional		32	125,333	86,000	56.4	
Lyon 2 <sup>1</sup>	no-till	22	40	118,667	99,333	61.7	NS
	conventional		19	128,333	99,667	64.0	
Lyon 3	no-till	15	78	130,833	114,667	57.9	NS
	conventional		29	122,666	120,000	58.2	
Lyon 4	no-till	30	78	113,000	-	65.9	**
	conventional		28	119,333	-	57.9	
Sioux 1	no-till	30	84	128,667	116,667	64.3	NS
	conventional		50	125,000	117,667	65.5	
Sioux 2	no-till	15	83	106,000	110,000	47.6	NS
	conventional		27	111,666	110,333	49.0	

All yields adjusted to 13.0% moisture.

Stands indicate approximate plants per acre.

\*\* = statistically different,  $P < 0.05$ .

NS = not statistically different,  $P > 0.05$ .

<sup>1</sup> = stover removed from plot the previous fall.