

## Introduction to Ohio's Organic Field Crop Transition Experiment

Deborah H. Stinner<sup>1</sup>, John Cardina<sup>2</sup>, (Benjamin R. Stinner<sup>3</sup>), David McCartney<sup>3</sup>, Robin Taylor<sup>1</sup>, Krishna Prasad Vadrevu<sup>3</sup>, Marvin Batte<sup>4</sup>, Parwinder Grewal<sup>1</sup>, Hans Klompen<sup>1</sup>, P. Larry Phelan<sup>1</sup>, Fred Michel<sup>5</sup>, Jerome Rigot<sup>5</sup>, Athanasios Alexandrou<sup>6</sup>,  
Departments of <sup>1</sup>Entomology, <sup>2</sup>Horticulture and Crop Science, <sup>4</sup>Economics and Resource Development, <sup>5</sup>Food and Biological Engineering, <sup>3</sup>Agroecosystems Management Program, and the <sup>6</sup>Agriculture Technical Institute  
The Ohio State University – OARDC  
1680 Madison Ave., Wooster, OH 44691  
<sup>6</sup>The Ohio State University – ATI  
1328 Dover Rd., Wooster, OH 44691  
Rex Spray, Charles Eselgroth, Joe Hartzler, Dean McIvaine, David Kline  
Farmer Advisors

This experiment was established at the request of stakeholders in Ohio's organic community who desired scientific understanding of organic field crop farming systems and specifically requested that OARDC researchers establish a long-term organic farming systems experiment. It was designed to build basic understanding of short and long-term ecological changes in land that is transitioned from conventional to organic production, to demonstrate the transition process and evaluate agronomic, economic and environmental costs and benefits. During spring 2000, two different cropping systems: conventional corn-soybean and organic corn-soybean-small grain-hay were established in a conventional field with a 15 year history of continuous corn. The conventional system represents what is dominantly on the agricultural landscapes of Ohio and much of the Midwest and is managed according to conventional best management practices. The organic system represents an organic rotation that has proven sustainable for some of Ohio's most successful long-term organic farmers. It is managed using both practical knowledge from these farmers and scientific knowledge of soil organic matter dynamics in relation to nutrient cycling and crop production. All phases of rotations are present each year in a randomized split-block design with six replicates, with individual plot sizes of 60 x 60'. Soil type is Wooster silt loam. Indicators of soil quality, nutrient cycling and carbon sequestration, crop production and quality, soil invertebrates, weed ecology and profitability are being studied by a multi-disciplinary team of researchers with input from advisory farmers. Baseline soil and weed seed bank samples were collected before experiment establishment. Organic plots were certified in 2002.

The following management protocols were used for the farming systems:

### ***Organic Farming System***

#### Rotation Crops

*Corn – Vinton 81 Soybeans – Oats – Red Clover/Timothy Hay*

Starting in fall of 2003, the organic rotation became:

*Corn - Vinton 81 Soybeans - Spelt – Red clover/Resistant Alfalfa/Timothy Hay.*

Certified organic available seed has been used since 2002 in the organic system.

#### Fertility

Corn: 12T/Ac Strawpack manure + 1.25 T/Ac DayLay applied spring

Oats: 8 T/Ac Strawpack manure + 0.8 T/Ac DayLay applied spring.

Primary Tillage

Corn and soybean plots moldboard plowed during the first four years.

Starting spring 2004 soybean plots chisel plowed.

Weed Control

Mechanical, typical operations include at least two diskings and or field cultivations before planting, two rotary hoeings or tine weedings soon after planting and two row cultivations.

***Conventional Farming System***

Rotation Crops

Conventional corn hybrids and Round-Up Ready soybeans used to reflect what the majority of conventional farmers are using.

Fertility

Starter chemical fertilizer at planting followed by a N side dress.

Primary Tillage

Corn is chisel plowed. Soybeans are no-tilled.

Weed Control

Herbicides

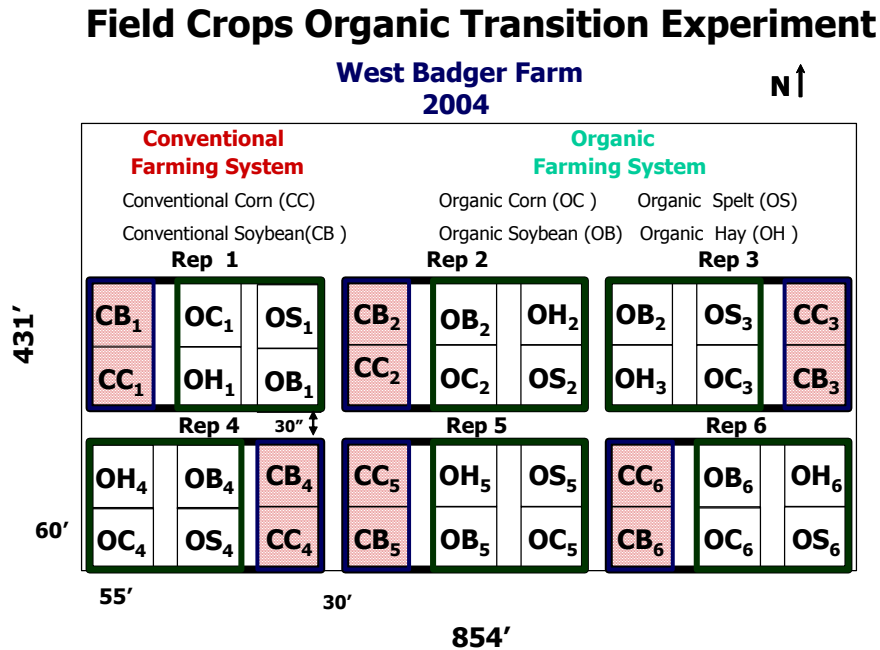


Figure 1. Experimental layout of Ohio's Field Crop Transition Experiment.