Replicated research plots comparing four treatments (management systems) were established.

- No-till treatment (conservation system), winter cover crop followed by soybeans or corn.
- Conventional till treatment (profit driven system), winter wheat cover crop to harvest followed by soybeans or corn.
- No-till treatment with cattle grazed winter cover crop.
- Conventional till treatment with cattle grazed winter cover crop.

Data and observations to date suggest practical lessons for organic management:

- Early fall planting of the cover crop is important to establish enough cover.
- Grazing is valuable for cattle weight gain but grazing too long allows weeds to outgrow the cash crop.
- Earlier crop planting dates and higher seeding rates are beneficial.
- Consistent and aggressive cultivation is needed to control weeds.

Three farm-scale sized demonstration plots were established.

- Arkansas site covers 12 acres, divided between the no-till and conventional till systems.
- Missouri site covers 12 acres and applied the integrated treatment across no-till and conventional till.
- Tennessee site covers 20 acres, divide between the no-till and conventional till treatments.

WHAT HAS BEEN COMPLETED TO DATE:

Replicated research plots comparing four treatments (management systems) were established.

- No-till treatment (conservation system), winter cover crop followed by soybeans or corn.
- Conventional till treatment (profit driven system), winter wheat cover crop to harvest followed by soybeans or corn.
- No-till treatment with cattle grazed winter cover crop.
- Conventional till treatment with cattle grazed winter cover crop.

Data and observations to date suggest practical lessons for organic management:

- Early fall planting of the cover crop is important to establish enough cover.
- Grazing is valuable for cattle weight gain but grazing too long allows weeds to outgrow the cash crop.
- Earlier crop planting dates and higher seeding rates are beneficial.
- Consistent and aggressive cultivation is needed to control weeds.

Three farm-scale sized demonstration plots were established.

- Arkansas site covers 12 acres, divided between the no-till and conventional till systems.
- Missouri site covers 12 acres and applied the integrated treatment across no-till and conventional till.
- Tennessee site covers 20 acres, divide between the no-till and conventional till treatments.

Three field day events are planned for fall 2023 to promote organic production and demonstrate management practices. The events will illustrate methods that can be used in transitioning land to organic production.

Research plot results suggest that establishing vigorous winter cover crops, planting the summer cash crop as early in the spring as practical, and timely cultivation of row crops are the most beneficial practices.

Economic analysis points to break-even yields that are lower for organic systems than conventional systems, suggesting potentially greater profit.

Grazing on winter cover crops was effective in the treatment and provided valuable livestock feed.

Alternative practices, such as switching to forage soybean production in adverse conditions, offered flexible management options.

SIGNIFICANCE OF THE FINDINGS:

Research plot results suggest that establishing vigorous winter cover crops, planting the summer cash crop as early in the spring as practical, and timely cultivation of row crops are the most beneficial practices.

Economic analysis points to break-even yields that are lower for organic systems than conventional systems, suggesting potentially greater profit.

Grazing on winter cover crops was effective in the treatment and provided valuable livestock feed.

Alternative practices, such as switching to forage soybean production in adverse conditions, offered flexible management options.

EXTENSION AND/OR EDUCATION ACTIVITIES:

A farmer workshop was held on March 28, 2023, providing information about the project, research and results, and an introduction to the USDA organic certification processes.

Three field day events are planned for fall 2023 to promote organic production and demonstrate management practices. The events will illustrate methods that can be used in transitioning land to organic production.

This work is supported by the Organic Agriculture Research and Extension Initiative (OREI) award no. 2021-51300-35727 from the USDA National Institute of Food and Agriculture.