Sustainable Agriculture: Defining the Middle Ground

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Paradigm: a philosophical and theoretical framework of a scientific school or discipline within which theories, laws, and generalizations and the experiments performed in support of them are formulated; broadly: a philosophical or theoretical framework of any kind

--Merriam-Webster
Ideology:  

a: a systematic body of concepts especially about human life or culture

b: a manner or the content of thinking characteristic of an individual, group, or culture

c: the integrated assertions, theories and aims that constitute a sociopolitical program

---Merriam-Webster
**Dogma.** *n,* 1a: something held as an established opinion; esp: a definite authoritative tenet

1b: a code of such tenets

1c: a point of view or tenet put forth as authoritative without adequate grounds

2: a doctrine or body of doctrines concerning faith or morals formally stated and authoritatively proclaimed by a church.

---*Merriam-Webster*
Changing Customer Demands

- Increasing Environmental Concerns
- Food Safety Issues
- Health Consciousness
Sustainable Agriculture

An agriculture than can evolve indefinitely toward greater human utility, greater efficiency of resource use, and a balance with the environment that is favorable to humans and to most other species.

---Richard Harwood, 1989
USDA Sustainable Agriculture Research and Education (SARE) Program

All projects supported by SARE must enhance sustainable agriculture, and over the long-term:

- enhance environmental quality and the natural resource base upon which the agricultural economy depends;

- make the most efficient use of nonrenewable and on-farm resources and where appropriate, integrate natural biological cycles and controls;

- sustain the economic viability of farm operations; and enhance the quality of life for farmers/ranchers and society as a whole.
Goals of Sustainable Agriculture

Economically Vibrant Farm Families and Rural Communities

- Environmental Quality
- High Quality, Safe and Nutritious Food Supply
- Soil and Land Stewardship
- Economically Vibrant Farm Families and Rural Communities
Sustainable Agricultural Systems

Seeking to Integrate Economic and Environmental Performance
Certification of “Sustainably Grown”

Food Alliance is a non-profit organization that promotes sustainable agriculture by recognizing and rewarding farmers who produce food in environmentally friendly and socially responsible ways, and educating consumers and others in the food system about the benefits of sustainable agriculture.

http://www.foodalliance.org
Sustainable Agriculture

- Soil Conservation
- Conservation Tillage
- Cover Crops
- Nutrient Management
- Crop Rotation
- IPM Biocontrol
- Intensive Grazing
- Multiple Cropping
<table>
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<tr>
<th>Tillage System</th>
<th>Graded Yield$^1$ Tons/Acre</th>
<th>Tillage Costs$^2$ $/acre</th>
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<tbody>
<tr>
<td>Strip-till</td>
<td>8.9</td>
<td>8.3</td>
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<tr>
<td>Conv.-till</td>
<td>8.6</td>
<td>8.3</td>
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**Table 1.** Tillage system effects on average sweet corn yield and tillage costs (*Data from Luna and Staben, 2002*).
Effect of Tillage Treatment on Broccoli Yield
OSU Vegetable Research Farm, 1999

Tillage Treatment

CT
ST-M
ST-C
Tillage Effect on Flea Beetles

![Bar chart showing adult flea beetles per plant across different sampling dates: 18-Jun, 21-Jun, 22-Jun, and 29-Jun. The chart compares three tillage treatments: CT, ST-C, and ST-M.](image-url)
Future Directions in Research

1. Different cover crop species and mixtures- (no cereals)
2. Improved precision in-row mechanical and thermal weed control
3. Improved thermal weed control technologies for suppression of cover crops and weeds between rows
Cover crop mixture

_Phacelia tanacetifolia_
and Common Vetch

Oats
Paradigm Shift
QUESTION: Is there such thing as "sustainable agriculture?"

Ultimately all systems of agriculture are unsustainable if they utilize nonrenewable energy sources for production, processing or transportation.
Sustainability is a multi-dimensional goal that involves making trade-offs.

The parameters of sustainability provide a lens to examine farming technologies, practices, and systems.
“Learning, discovery, and improvement are continuing processes. We are never finished.”
Questions to consider for adoption of new technologies or farming practices

*Does the new technology or farming practice:*

1. Increase the economic viability of farm families and rural communities?
2. Provide high quality, safe and nutritious food and fiber supply?
3. Protect and enhance environmental quality?
4. Protect and enhance soil and land stewardship?