Funding Impact Brief #2: Long-Term Agroecological Research (LTAR)

Leopold Center for Sustainable Agriculture

Follow this and additional works at: http://lib.dr.iastate.edu/leopold_pubspapers

Part of the Agriculture Commons

Recommended Citation
Leopold Center for Sustainable Agriculture, "Funding Impact Brief #2: Long-Term Agroecological Research (LTAR)" (2013). Leopold Center Pubs and Papers. 47.
http://lib.dr.iastate.edu/leopold_pubspapers/47

This Report is brought to you for free and open access by the Leopold Center for Sustainable Agriculture at Iowa State University Digital Repository. It has been accepted for inclusion in Leopold Center Pubs and Papers by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
Funding Impact Brief #2: Long-Term Agroecological Research (LTAR)

Abstract
This publication looks at what’s been learned from the Long-Term Agroecological Research (LTAR) experiment, and other opportunities created by the Leopold Center’s major investment in this work. The side-by-side comparison of organic and conventional agriculture practices is one of the longest-running comparisons in the country.

Disciplines
Agriculture
Funding Impact Brief #2: Long-Term Agroecological Research (LTAR)

**The LTAR experiment**
Principal investigator: Kathleen Delate, Professor of Agronomy and Horticulture, Iowa State University

Iowa farmers expressed interest to the Leopold Center in learning more about organic practices, and requested a long-term study comparing the viability of organic crop rotations with conventional corn-soybean rotations. This request resulted in the LTAR experiment. LTAR is a randomized, side-by-side comparison of organic and conventional agriculture near Greenfield, Iowa—one of the longest running replicated comparisons in the country. The project began in 1998 with support from the Leopold Center as part of the Organic Agriculture Program at ISU. The project compares various crop rotations of corn, soybeans, oat, alfalfa, wheat and red clover using identical crop varieties. Each trial is repeated four times in 44 plots.

**What did we learn?**
- Averages from 14 years of the LTAR experiment show that yields of organic corn, soybean and oats have been equivalent to or greater than conventional counterparts. A 13-year average for alfalfa and 9-year average for winter wheat also show no significant difference between organic yields and the county averages.
- On average, returns to management for organic systems are roughly $200 per acre greater than conventional returns.
- Organic systems have lower production costs because they eliminate the need for expensive herbicides and synthetic fertilizers; organic crops have higher value on the market.
- Researchers measured higher concentrations of carbon, potassium, phosphorous, magnesium and calcium in the organic soils, and total nitrogen increased by 33 percent in the organic system.
- Results suggest that organic farming can create greater efficiency in nutrient use and higher carbon sequestration potential.

**Why does it matter?**
Delate surveys clientele every 5 years to determine the growth of organic agriculture in Iowa and the impact of the ISU Organic Agriculture Program. In November 2007, a survey was distributed to 500 organic and transitioning producers and processors in Iowa. Twenty percent of respondents reported an 11-20 percent increase in farm income, 28 percent of respondents reported an increase in soil quality on their farms, and 54 percent of respondents supported expansion of organic research/extension at ISU.

**Personnel supported**
- 1 ISU faculty member
- 32 undergraduate students
- 11 graduate students

**By the Numbers**
- $900,000 awarded by the Leopold Center (1998-2012)
- $2,390,969 externally leveraged funds
- 21 key organizational, agency and institutional partners
- 100 organic and transitioning producers reported an 11-20% increase in farm income

**LTAR experiment plots near Greenfield, Iowa**
Credit: Kathleen Delate

Photo on back:
*Graduate student Dan Cwach poses in LTAR rye plot*
Credit: Kathleen Delate
**Products**
- 38 presentations at professional meetings with 2,792 participants
- 31 extension workshops with 1,453 participants
- 537 presentations to scientific, farm, and student audiences with 29,520 participants
- 1 ISU course developed, “Organic Agriculture: Theory and Practice” (HORT/AGRON/SUSTAG 484/584)
- 10 Iowa Organic Agriculture Conferences reaching 2,439 farmers and agriculture professionals
- 65 field days involving 5,036 farmers and agriculture professionals
- 20 international visiting scientists have worked on LTAR

**LTAR research partners**
- 8 public sector partners:
  - USDA-Agriculture Research Service’s Laboratory for Agriculture and the Environment; Natural Resources Conservation Service; Farm Services Agency; USDA-Sustainable Agriculture Research and Education; ISU Research and Demonstration Farms; USDA-Organic Research and Extension Initiative; USDA-Organic Agriculture Consortium, National OrganicAgInfo webpage
- 4 civic sector partners:
  - The Rodale Institute, Iowa Organic Conference, Practical Farmers of Iowa, the Iowa Organic Association
- 6 collaborating Iowa State University departments:
  - The Departments of Nematology, Entomology, Food Sciences, Economics, Agronomy, and Horticulture

**Leverage**
LTAR projects funded by the Leopold Center leveraged substantial amounts of additional funds totaling $2,390,969:
- $1,100,000 from the USDA-Sustainable Agriculture Research and Education, the Rodale Institute, and other industry groups
- $599,000 from the USDA for the ISU Organic Program
- $691,969 from the USDA’s National Institute of Food and Agriculture for the Organic Transitions Program at ISU

**Future opportunities**
Current research evaluates alternatives to the traditional corn-soybean rotation in Iowa and investigates agroecological production. This research is designed to reduce off-farm energy demand and to increase the resilience of agroecosystems which will help increase adaptability to potential climate changes.