TABLE 3.1. Current Agricultural Systems Projects in the United States

PROJECT	LOCATION	DESCRIPTION
Sustainable Agriculture Farming Systems (SAFS) 1988–2002* (after 2002 merged with LTRAS)	UC Davis, Davis, CA	Initiated to produce information on sustainable farming practices, the experiment station-based project compared organic, low-input and conventional tomato farming systems in California's Sacramento Valley. The project involved a close partnership and information exchange between producers and researchers seeking to compile data most relevant and similar to commercial production.
Rodale Institute Farming Systems Trial (FST) 1981–current*	Rodale Institute, Kutztown, PA	Initiated to compare the benefits of organic agriculture over conventional agriculture, this trial takes a long-term approach to data collection and research. The project compares conventional, no-till, organic manure and organic legume treatments of corn and soybean rotations.
Agricultural Research Service Farming Systems Project 1993–current	Beltsville Agricultural Research Center, Beltsville, MD	Modeled on Rodale's FST project, this research involves five replicated cropping systems, each under three tillage options and controlled for site variation. Three organic and two conventional cropping systems are planted annually; each system differs in nutrient source, weed control and crop rotation and is managed under no-till, conventional or chisel tillage. Data are analyzed to assess the economic, agronomic, soil health, nutrient dynamic and biological sustainability of the treatments.
Long Term Research on Agricultural Systems (LTRAS) 1993–current*	Russell Ranch Sustainable Agriculture Facility, UC Davis, CA	LTRAS assesses the long-term sustainability of different crop rotations, farming systems, nitrogen inputs and levels of water use. Ten systems are studied, using rotations of tomatoes, wheat, corn, legumes, perennial grasses and alfalfa in replicated microplots.
University of Wisconsin Integrated Cropping Systems Trial (WICST) 1989–current*	UW-Madison Arlington Agricultural Research Station, southern Wisconsin	WICST provides data from three cash grain cropping systems and three forage systems in field-scale plots. Initially launched to determine if increasingly complex rotations could reduce reliance on commercial inputs, WICST has progressed to answer broader questions about sustainability using long-term data. Data on soil fertility, weed control, earthworm populations and groundwater contamination are collected from three replicated cash grain systems and three forage grain systems; there is also a focus on economic analysis of productivity.
University of Minnesota Variable Input Crop Management Systems (VICMS) 1989–current*	Southwestern Minnesota	VICMS studies the effects of four management levels on corn–soybean and corn–soybean–oat–alfalfa rotations. Management includes no inputs, lower purchased inputs, higher purchased inputs, and organic inputs. Each management/rotation combination has three replicates and is analyzed for yield, profitability and effects on soil quality.
Iowa State Long-Term Agroecological Research (LTAR) 1998–current*	Leopold Center, Ames, IA	A long-term arm of the ISU Organic Agriculture Project, LTAR is an ongoing study of the different effects of organic and conventional systems on soil quality, water quality, energy use, economic returns and weed management. The study includes four randomized rotations of corn, soybeans, alfalfa, oats, wheat and red clover. Data collected thus far have provided strong support for the environmental benefits of organic agriculture.
New Hampshire Dairy Project 2011–2015*	Organic Dairy Research Farm, Lee, NH	This four-year project focuses on sustainable livestock farming, specifically how alternative feeding crops such as warm- and cool-season grasses, summer annuals, pasture brassicas and silage affect both the environment and the quality of milk produced. In an effort to increase the sustainability of dairy operations while complying with pasture-focused FDA rules, researchers assess methane emissions, soil nitrous oxide output, overall greenhouse gas emissions, milk quality and the cost of feeding cows on these alternative pastures.
Kellogg Biological Research Station - Long Term Ecological Research (LTER) 1988–current	Hickory Corners, MI	Part of the National Network of LTER sites, the Kellogg Biological Research Station provides a space for more than 100 scientists to conduct experiments on pressing agroecological questions while contributing to national education and outreach. Many researchers work to find methods of increasing the profitability of agriculture while providing environmental benefits. Focuses include agronomy, microbial ecology, plant dynamics, insect dynamics, biogeochemistry, regionalization, ecosystem services and biofuels.
Center for Environmental Farming Systems (CEFS) 1994–current*	Goldsboro, NC	A partnership between North Carolina State University, North Carolina Agricultural and Technical State University and the North Carolina Department of Agriculture and Consumer Services, CEFS provides a physical base for research and demonstration projects at Cherry Research Farm. Field research units focus on six areas: alternative swine production, farming systems, organic systems, pasture-based beef, pasture-based dairy and small-farm production. CEFS's farming systems research unit compares five ecosystems: an integrated crop–animal system, an organically managed cropping system, a conventional cash cropping system, a successional ecosystem and a plantation forestry system.
Sustainable Cropping Systems for Dairy Farmers in the Northeast 2010–current*	State College, PA	This large-scale, multidisciplinary systems project at Penn State University compares two diverse six-year rotations that include continuous covers such as rye, canola, oats and alfalfa, interspersed with corn and soybeans. Both rotations use multiple strategies to promote sustainability and minimize off-farm inputs while producing forage, feed and fuel for a simulated 65-cow, 240-acre dairy farm.

TABLE 3.2. Major Factors Determining Management Decisions for Four Organic Cropping Systems

	CS1-TYPICAL PRACTICE	CS2-INCREASED USE OF COVER CROPS	CS3-REDUCED CASH CROP INTENSITY	CS4-REDUCED TILLAGE INTENSITY
Income goal	Max income/acre	Max income/acre	Max income/hour	Max income/acre
Primary constraint	Land	Land	Labor	Land
Cropping intensity	Cash crop every year, double crops when possible	Cash crop every year, no double cropping	Cash crops alternate with a fallow year with intensive cover cropping	Cash crop every year, no double cropping
Management Priorities				
First	High soil fertility	Soil health: increased use of cover crops	Low weed pressure	Soil health: reduced tillage
Second	Weed management	Low weed pressure	Soil health: increased use of cover crops	Low weed pressure
Third	Soil health: mainly compost inputs, some use of cover crops	Reduced purchased inputs	Reduced purchased inputs	Reduced purchase inputs