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Raising Organic Research to Scale

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Organic Farming Research in the US and the UC



**Helene Dillard, Dean
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Environmental Sciences
University of California, Davis**

Organic Agriculture Research and Extension Initiative (OREI USDA-NIFA)

- **Funding opportunity for land grant universities, private universities and institutions**
- **\$18M estimated total program funding**
- **Fund projects that will enhance the ability of producers and processors who have already adopted organic standards to grow and market high quality organic products**
- **Assist farmers and ranchers with whole farm planning**
- **Fieldwork must be done on certified organic land or on land in transition to organic certification**
- **<http://nifa.usda.gov/funding-opportunity/organic-agriculture-research-and-extension-initiative>**

Organic Farming Research Foundation (OFRF)

- **Funding opportunity for land grant universities and private institutions, farmers**
- **Works to foster the improvement and widespread adoption of organic farming systems**
- **Strong advocacy for organic systems and policies that help farmers transition into organic production**
- **List of resources for organic and transitioning farmers**
- **Searchable database of research projects**
- **<http://ofrf.org>**

University of California

- **UC Santa Cruz – Center for Agroecology and Sustainable Food Systems; UCSC Farm and the Alan Chadwick Garden used for training and research, both are certified organic. Apprenticeship – 6 month full time residential program**
- **UC Berkeley – Berkeley Food Institute; supports changes in food systems to promote diversity, justice, resilience, and health. Gil Tract Community Farm; urban agricultural learning center; provides access to organic food**
- **UC Riverside – known globally for research on organic insect pest management using natural enemies, mating disruptions, pheromone traps**
- **University of California Division of Agriculture and Natural Resources (Cooperative Extension). Numerous organic resources on web site. Small and Organic Farm Advisor Yolo, Solano, Sacramento Counties**

University of California, Davis

- **Agricultural Sustainability Institute**
- **Russell Ranch Sustainable Agriculture Facility (300 acres): irrigated and dry-land agriculture, Century Experiment comprised of 72 one-acre plots measuring long term impacts of farming systems and inputs**
- **Certified Organic Student Farm (20 acres): ecological garden, market garden, student farm shop, vineyard, student farm compost; kids in the garden program**
- **Internships; on farm experience**
- **Sustainable Agriculture and Food Systems Major**

UC Davis, Training the next generation



UC Davis, Training the Next Generation

- **In the last 5 years, student participation in the Student Farm has expanded dramatically**
- **The number of internships completed has increased ten-fold to more than 125/year**
- **The total number of students engaged through all modes of weekly participation (as course enrollees, employees, volunteers or interns) has tripled to more than 480/year**
- **An additional 1,000 students/year participate in the Student Farm in other ways, such as through class visits and workshops.**

University of California, Davis

- **Organic plant breeding project: partnership with Agriculture Sustainability Institute, faculty and student breeders in plant sciences, Organic Seed Alliance, producers, seed industry and UC Cooperative Extension. Goal is to provide CA organic producers with crop varieties that are specially bred for organic farming. Funded by OREI.**
- **<http://orei.faculty.ucdavis.edu/>**



University of California, Davis

- **Organic management of garden symphylans in annual cropping systems (Mark Van Horn)**
- **Harnessing aphid alarm pheromone to rid broccoli heads of aphids (Phillip Fujiyoshi)**
- **New and effective fertilizers for organic rice producers (Linguist, Wild, Lundberg, Scheidel)**
- **Cost effective weed and nutrient management practices in organic pear orchards (Ingels, Lanini, Klonsky, Frieders, Shackel)**
- **Developing test protocols to assure the quality of fertilizer materials for organic agriculture (Horwath, Parikh)**
- **Statistical review of California's organic agriculture (Klonsky)**

Challenges = Opportunities

- **Funding for research and outreach (supplies, equipment, graduate students, post docs, undergraduate interns, publication costs, conference and workshop costs, travel)**
- **Availability of Certified organic land for research**
- **Whole farm (holistic approaches, ecological and systemic approaches) ... university plot/farm research (controls, applied research, scientific reductionism)**
- **Need for systems AND component studies**
- **Ecological webs are often site specific**
- **Scaling the research...organic farms can range in size from less than one acre to over 10,000 acres**
- **Short duration studies (irrigation, insect pest)...long duration studies (soil health, biodiversity, weed and disease management, fertility, breeding, invasives)**

For more information:

COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES

Agricultural Sustainability Institute
www.website.ucdavis.edu

Student Farm at UC Davis
<http://asi.ucdavis.edu/programs/sf>

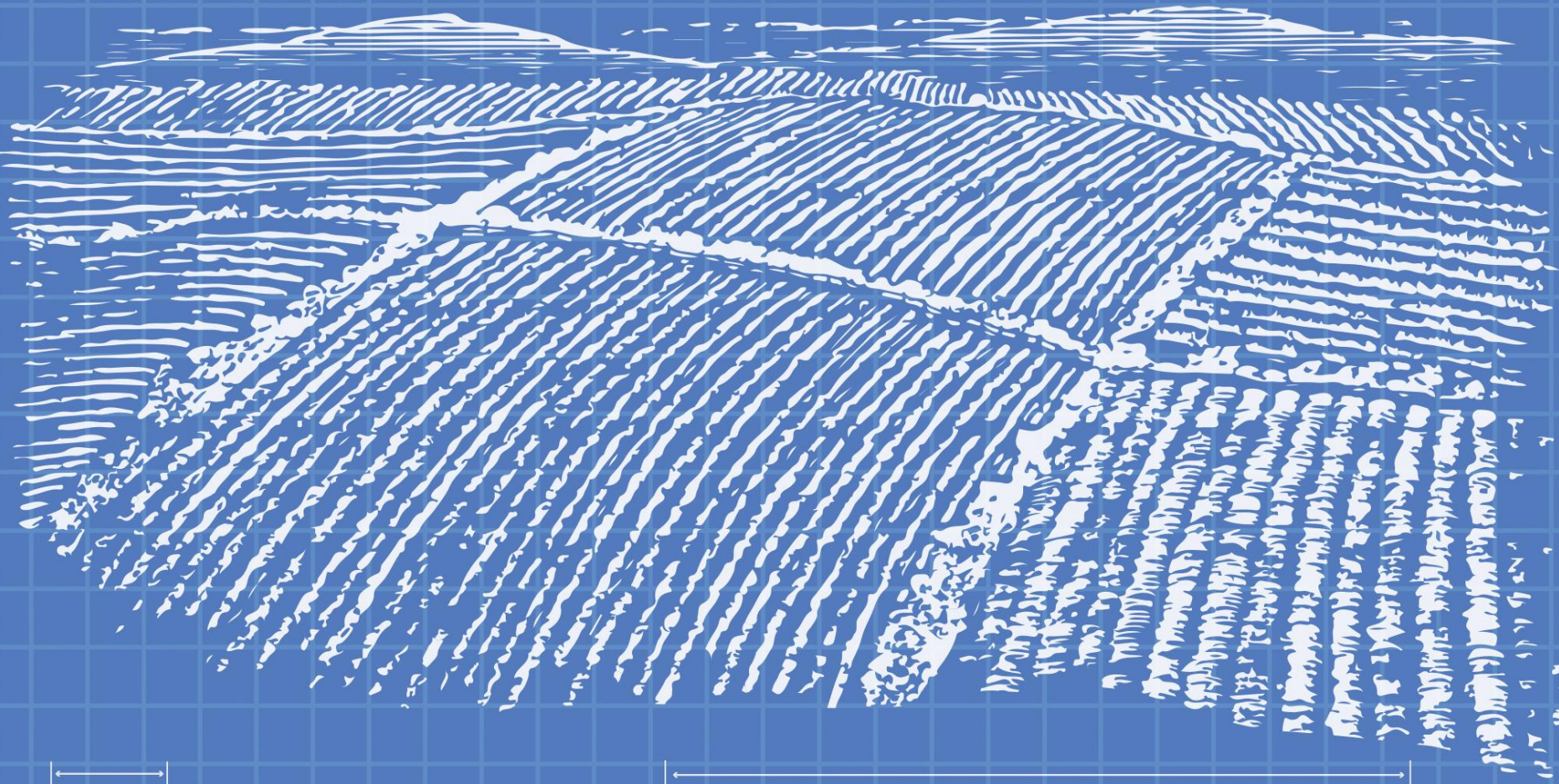
Russell Ranch Sustainable Agriculture Facility
<http://asi.ucdavis.edu/programs/rr>

Plant Breeding for Organic Systems
<http://orei.faculty.ucdavis.edu/>

Center for Agroecology & Sustainable Food Systems
<http://casfs.ucsc.edu/>

UC Division of Agriculture & Natural Resources
<http://ucanr.edu/>





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Raising Organic Research to Scale

2016 CCOF Annual Meeting

Brise Tencer, Organic Farming Research Foundation

Organic Farming Research Foundation



Mission: To foster the improvement and widespread adoption of organic farming systems.

Vision: Organic farming is the leading form of agriculture, leading to healthy and resilient people, ecosystems and economies.



ORGANIC FARMING RESEARCH FOUNDATION

Supporting Organic Science Since 1990



Developing a National Organic Research Agenda

a roadmap for farmers, researchers,
policy makers



Gathering Input on Research Agenda

Listening Sessions:

8 farmer/researcher sessions around the US.

Research Survey:

Distributed to all US certified organic farmers.

Over 1,000 organic farmers participated.



Most pressing challenges by region

West

Water shortage
Weeds
Plant diseases

North Central

Soil health
Weed management
Cover cropping
GMO contamination



Northeast

Weeds
Milk and live
profitability
Market entry

South

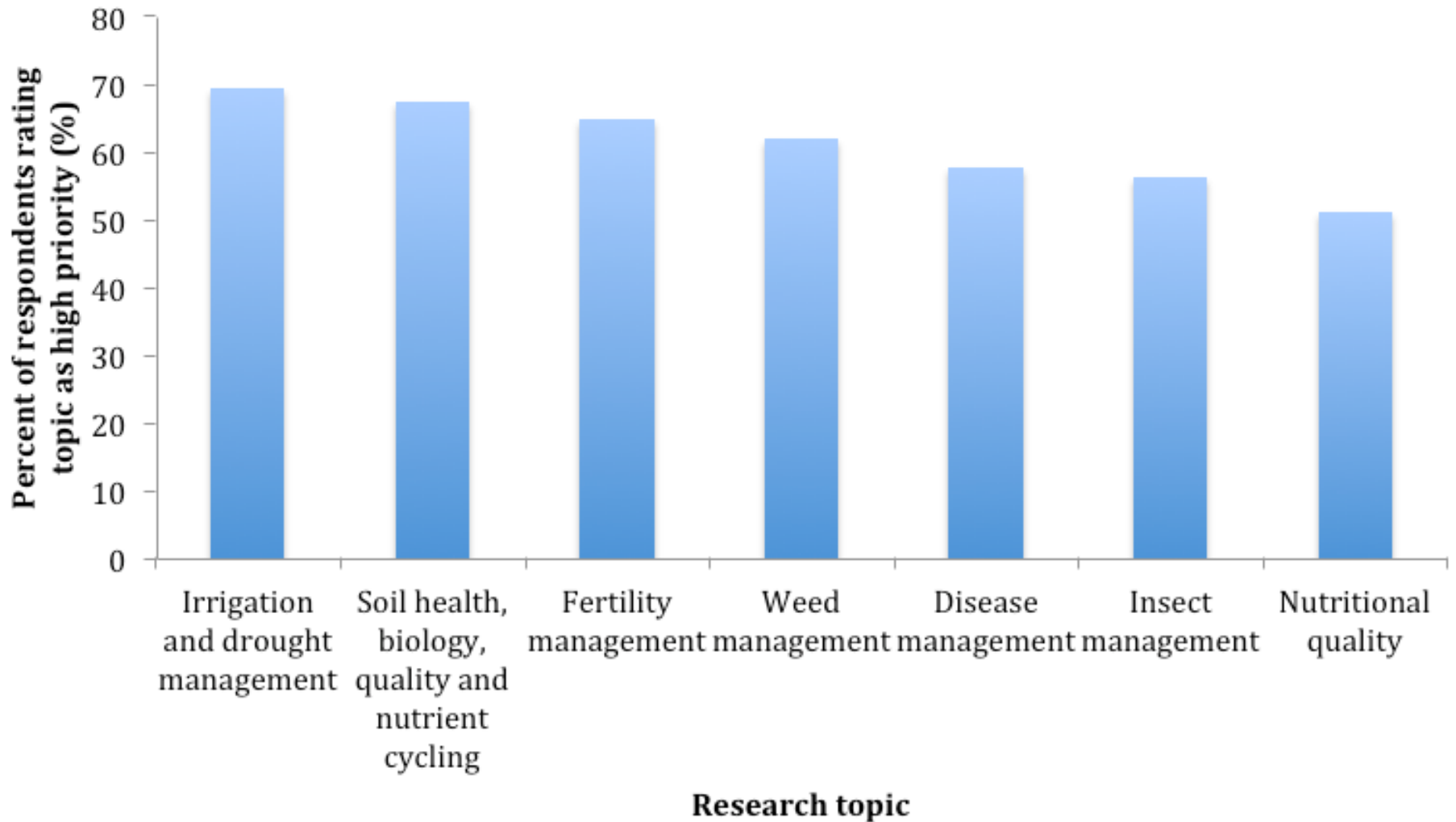
Labor shortage
Weeds
Stinkbugs and insect pests
Drought and excess rain

CA Region grower responses

- 173 complete survey responses and 71 partially complete responses
- 3 CCOF hosted listening sessions with 38 growers participating



CA research priorities





Top needs:

Water management: optimum water for different plant species, groundwater monitoring, climate impacts on water and tree fruit maturity

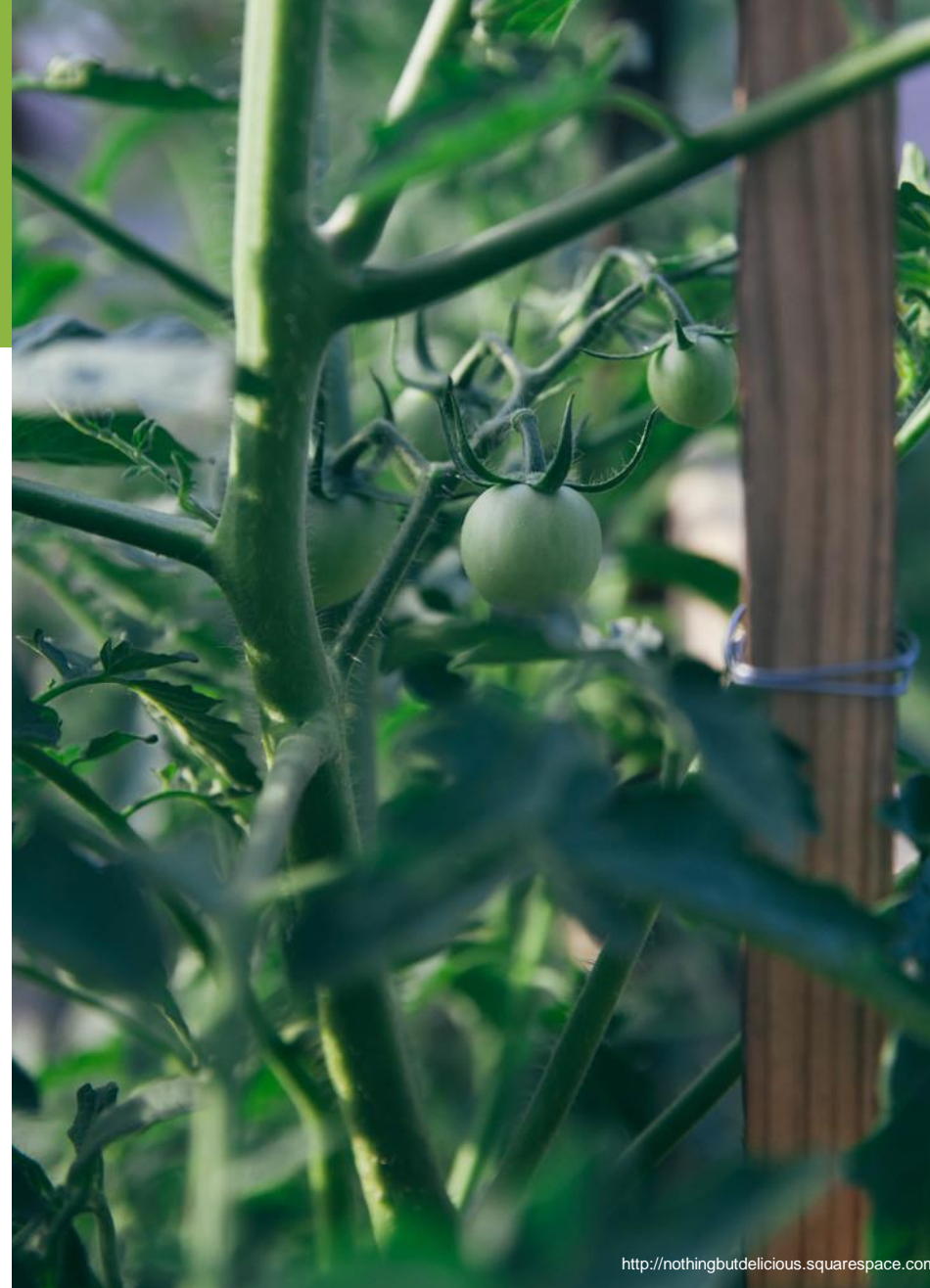
Weeds: new weed machinery, cape ivy, Johnson grass

Pests: ants, vine mealybug, wireworms, aphids, citrus psyllid, bagrada bug, olive fly, spider mites, flea beetle, lygus, rodents

Disease: fireblight, mildew in wine grapes, leaf curl virus, Pierce's disease, brown rot, botrytisphaeria

OTHER HIGH PRIORITIES

- Fertility management
- Nutritional quality and health benefits of organic food
- Insect pest management
- Water management
- Disease management
- Pollinator health
- Economics and marketing of organic products



<http://nothingbutdelicious.squarespace.com>

Research on weed management a high priority for 61% of CA respondents

“Using animals to manage weeds, disease and pests.”

“Rotation strategies to decrease annual weed pressure from specific weeds, especially purslane.”

“Rotation/tillage strategies or organic approved materials to eliminate bind weed.”

“Using weeds to our benefit (what do they put back into the soil if tilled in), killing with vinegar and molasses.”



NORA Survey Acknowledgements

Research Team

OFRF Team

Dr. Diana Jerkins

Dr. Joanna Ory

Washington State University

Thom Allen

Rose Krebill-Prather

Funders



Foundation for Sustainability and Innovation





Where are USDA Organic Research Dollars Going?

124 Organic Research and Extension Initiative (OREI) projects &
64 Organic Transitions (ORG) projects conducted between 2002 and 2014

- ✓ Many projects take integrated & holistic approach
- ✓ Innovative methods used to improve understanding of agro-ecological processes
- ✓ Projects developing & testing practical applications,
- ✓ Delivering findings to producers.
- ✓ Many projects engage producers and other stakeholders in all phases of the project
- ✓ Most projects addressed nutrient management, soil quality, and crop protection
- ✓ Most crop research (31%) was for vegetables, followed by fruits and grains
- ✓ Biggest category of livestock research was in dairy (10%)
- ✓ Investment in “environmental” issues: soil and water conservation; and water quality, soil improvement, and carbon sequestration
- ✓ 48% of projects involve some economic analysis
- ✓ 33% of projects addressed cover cropping, and over 25% of projects addressed crop rotation

OREI Initial findings



USDA funded projects address many of the priorities identified in OFRF's 2007 National Organic Research Agenda

Agenda

Soil microbiology, fertility, and quality

- a. nutrient management, budgeting, balance, plant availability – 100 projects (53%)
- b. evaluation and enhancement of soil life and soil quality – 95 projects (51%)

Systems approaches to crop pest management

- a. weeds – 83 projects (44%)
- b. insects – 70 projects (37%)
- c. diseases – 66 projects (35%)

Organic livestock and poultry production systems

- a. animal health – 20 projects (11%)
- b. pasture management and animal nutrition – 35 projects (19%)
- c. crop-livestock integration – 12 projects (6.4%)
- d. NOP-compliant livestock production systems – 11 projects (5.9%)

Breeding and genetics

- a. crop plants – 48 projects (26%)
- b. livestock and poultry – 8 projects (4.3%)

Examples of CA Projects

Nutrient Management in Organic Systems

Fertility and pest management, and strengthening researcher/grower networks

OREI 2004-05136, Gliessman, U California, Santa Cruz, \$572 K

Improved N management strategies for strawberry

Tradeoff between yield and N leaching in broccoli

Researcher and farmer innovation to increase nutrient cycling on organic farms

OREI 2009-01415, Louise Jackson, U California, \$372 K

Practical field methods for monitoring and managing N in organic systems

Team acquired additional funding to continue development of organic N management

CA Project (cont.)

Disease Management and Functional Agricultural Biodiversity

Soilborne pathogens and pests in organic vs conventional plots with conservation versus conventional tillage

ORG 2004-05151, L. Epstein, U California Davis, \$187 K

Soil nematode and micro-arthropod biota and disease suppression.

Part of a long term (100 year) systems study begun in 1990s

Nutrient dynamics, soil biota, and functional biodiversity at an organic farm

ORG 2004-05207, L. E. Jackson, U California Davis, \$298 K

Case study of organic farm in Yolo County

Led to wider study and CA Energy Commission white paper on climate change impacts

CA Project (cont.)

- **Farmer-researcher Networks**
- *A collaborative research and extension network for sustainable organic production systems in coastal California*
- OREI 2011-01969, Carol Shennan, U. California Santa Cruz, \$2.61 M
- On-farm research and periodic discussion of two- and four-year crop rotations assessed for C sequestration, net GHG footprint, disease suppression, nutrient cycling, and yield.
- Seven on-farm trials supplement research station trial.
- The two Nutrient Management projects also included strong farmer-scientist networks.

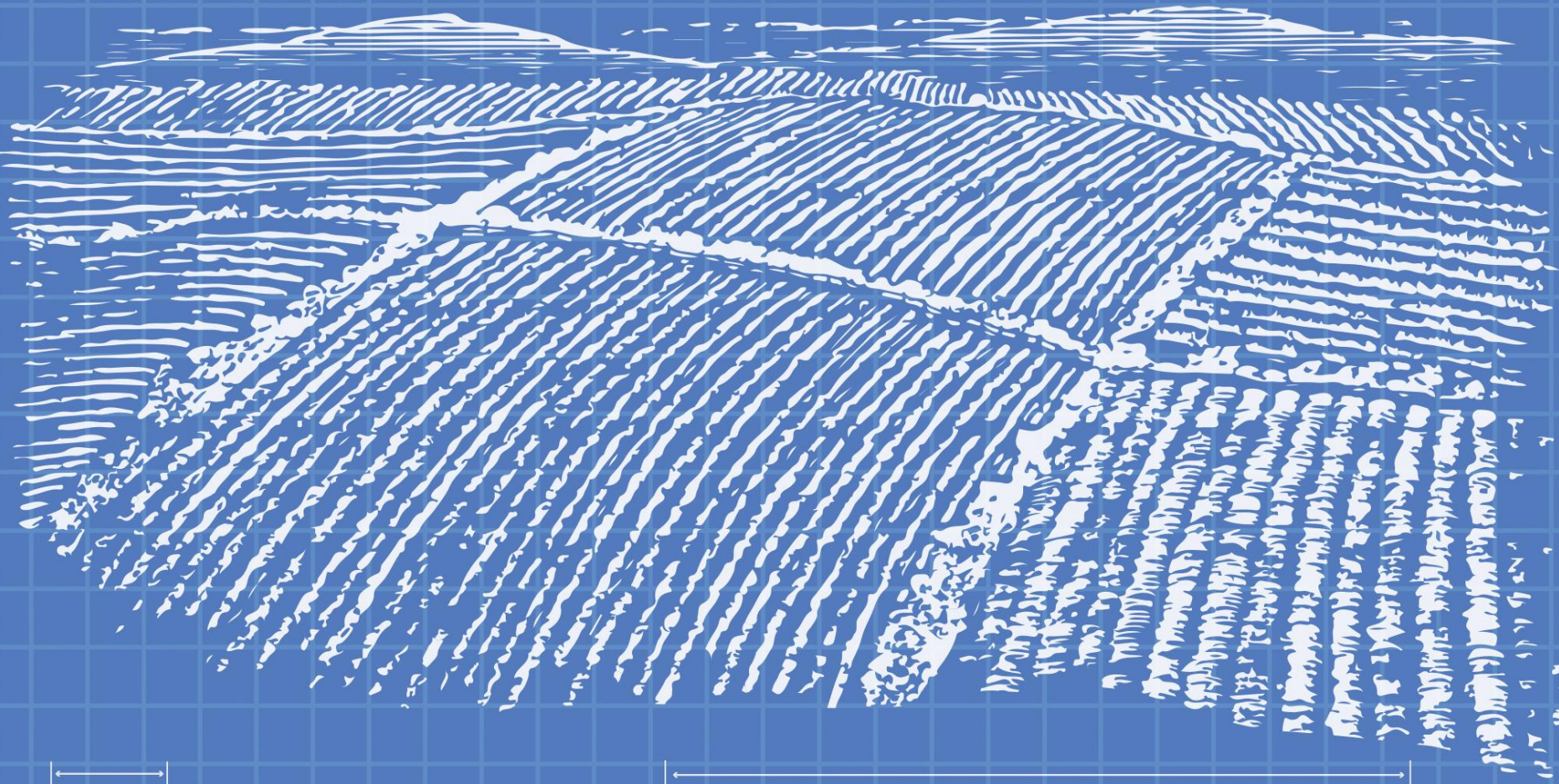
Proposed Recommendations to USDA-NIFA

- Continue and expand USDA funding for research into current priority issues for organic producers
- Continue funding farmer participatory classical plant breeding, with continuation grants when warranted.
- Continue to encourage innovative approaches to farmer engagement.
- Fund proposals for under-represented commodities (pork, beef, rice, cotton) and topics (animal breeding for organic), and under-served regions (Southern) and minority constituencies.



SUPPORT ORGANIC FARMERS BY
SUPPORTING ORGANIC RESEARCH

OFRF- Supporting organic research for 25 years.
www.ofrf.org



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Collaborative Approaches to Further Organic Research

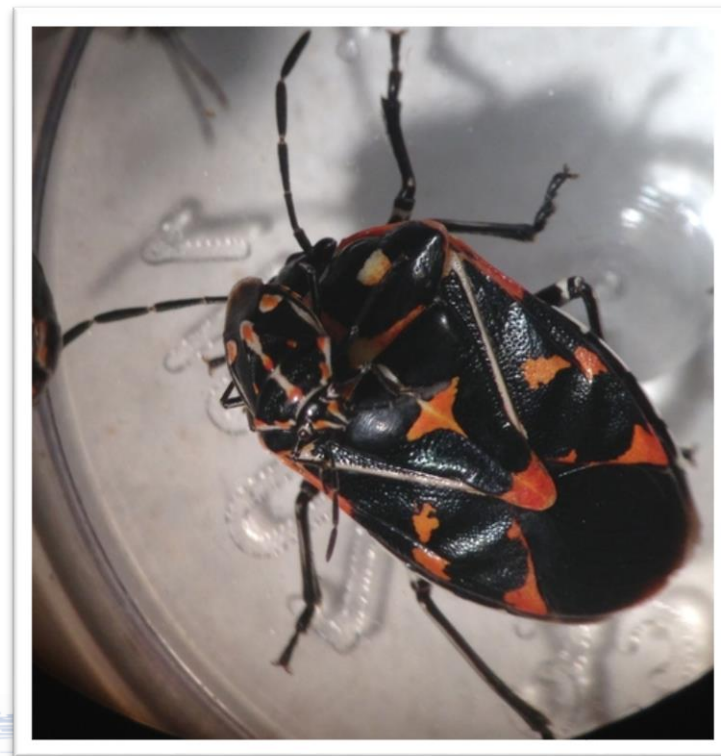
Jane Sooby
CCOF

Senior Policy & Outreach Specialist

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Bagrada Bug Working Group

- Bagrada bug issue raised by CCOF board
- CCOF contacted Karen Ross, Secretary of Food & Ag, who asked Plant Health and Pest Prevention Services to work with us



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Bagrada Bug Working Group



- PHPPS convened weekly conference calls—David Pegos
- Additional partners have joined: UC Cooperative Extension, USDA-ARS labs, UC Riverside, UC Davis, others

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Bagrada Bug Working Group Activities

Public Meeting Dec. 2015

- Public research meeting in Salinas
- Scientific presentations
- Farmer panel
- Broadcast for remote participants



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Bagrada Bug Working Group Activities

Newsletter

- Published quarterly
- Bagrada Bug updates from around the world
- Emphasis on practical management for farmers

A stylized illustration of a field with a beetle on a rolled-up scroll. The scroll is light green and has the text "Bagrada Bug News" written on it in a dark green, sans-serif font. A black beetle is positioned on the left side of the scroll, facing right. The background of the slide features a blue and white grid pattern at the top and a stylized, sketch-like illustration of a field with a beetle on a scroll at the bottom.

Bagrada Bug News

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Funding

- Each collaborator chips in staff time and resources to support the group effort
- CDFA-PHPPS hosts conference calls
- CCOF and UCCE shared lunch cost for public meeting; UCCE provided meeting space
- Farmer input at public meeting vital for successful grant applications
- Primary expense: time

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Partners



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Public-Private Partnerships: Great Potential

**Clif Bar Spearheads \$10 Million Investment to Fund
Five Endowed Chairs Focused on Organic
Agricultural Research**

Partners with Organic Valley on the first chair at the University of
Wisconsin-Madison

Emeryville, Calif. – June 23, 2015

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First Endowed Chair: Bill Tracy University of Wisconsin-Madison



- The grant will be funded in perpetuity by both companies
- Will be matched by a gift from University of Wisconsin graduates John and Tashia Morgridge.
- Supports organic crop breeding

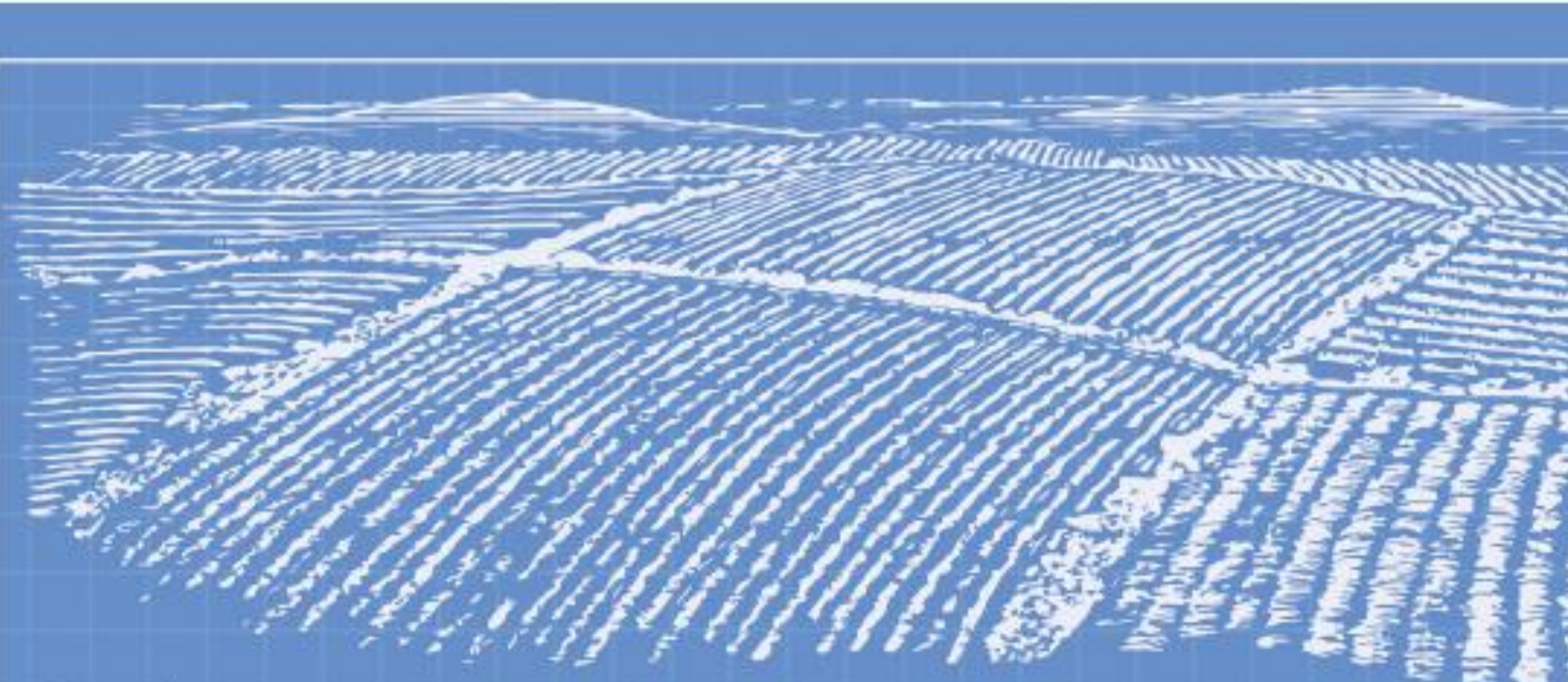
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**What Other
Creative
Partnerships Can
We Build?**

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Thank You

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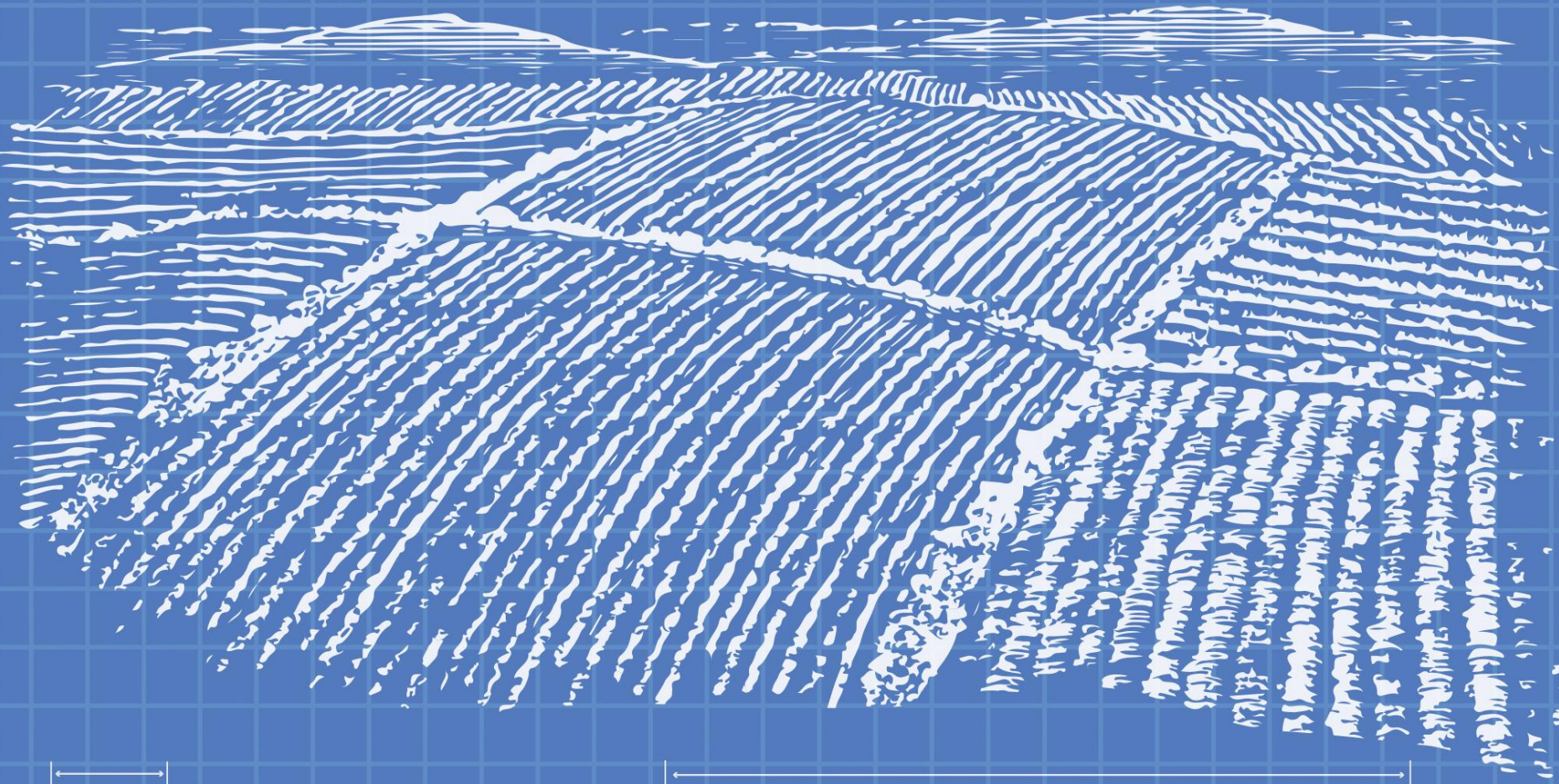


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2016 CCOF Annual Meeting & Conference

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Questions



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