

Ready... Or Not?

An Assessment of California Agriculture's Readiness for Climate Change



California Climate and Agriculture Network
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Executive Summary

Dependent on weather and the availability of natural resources, California agriculture is uniquely vulnerable to the effects of climate change. California agriculture's contributions to greenhouse gas (GHG) emissions are relatively small compared to those of other sectors of the economy, accounting for only 6 percent of the state's total emissions. However, agriculture has the potential to offer unique and significant climate solutions, including carbon sequestration and on-farm renewable energy generation.

Given California's leadership in tackling climate change, and its importance globally as an agricultural producer, it is essential to understand to what extent state government is supporting California agriculture in addressing its unique climate change challenges. To understand this, the California Climate and Agriculture Network conducted an assessment of the adequacy and availability of resources for California agriculture to address climate change.

Focus on Sustainable Agricultural Solutions

Farming systems that reduce the reliance on synthetic inputs, conserve natural resources and provide multiple environmental benefits offer promising opportunities within agriculture to mitigate and adapt to climate change. Sustainable and organic agriculture systems offer some of the best opportunities to reduce GHG emissions, sequester carbon and increase agriculture's resilience to climate change impacts.

Sustainable and organic farming systems apply an integrated, biological approach to farm management that emphasizes natural resource conservation, reduced farm inputs, biological and cultural control of pests, soil-building practices and grass-based livestock production systems. Because these systems function differently than their conventional counterparts, research must be designed to examine their unique benefits for reducing GHG emissions and adapting to climate change.

Study Goals and Methodology

In an effort to qualify and quantify the resources available in California for agriculture to mitigate and adapt to climate change, we identified the following goals for this study:

1. To identify state and federally funded research projects that address climate change mitigation and adaptation strategies specific to California agriculture.
2. To assess the extent to which sustainable and organic agricultural perspectives are incorporated in publicly funded California climate change and agriculture research.
3. To assess the state of technical assistance resources available to California farmers and ranchers.
4. To assess the availability of conservation incentives for California farmers and ranchers.

We divided the analysis of the status of resources available for California agriculture to address climate change into three categories: research, technical assistance and financial incentives.

We used the following criteria to identify publicly funded research included in our review:

1. California-based research
2. Directly addressed mitigation and/or adaptation agricultural practices to climate change
3. Funded or conducted since 2007

In an attempt to characterize some core aspects of sustainability in agriculture, we used the following six indicators of sustainability to evaluate each climate change and agriculture mitigation or adaptation study for its inclusion of sustainable agriculture practices and approaches: organic systems; integrated biological systems; water and energy efficiency and conservation; reduced inputs; economic impacts; social impacts.

To understand the state of technical assistance for the state's farmers and ranchers, we spoke to current and retired state and federal staff, reviewed newspaper articles and attended government agency meetings.

To analyze the status of direct incentive programs in the state to support on-farm conservation efforts, we reviewed both state and federally funded programs available to California producers.

Findings

A. Research Projects

In our review of state and federally funded research, we identified 115 California agriculture and climate change research projects initiated since 2007. Of these, we found only 39 research projects that focused on California agriculture-specific climate change mitigation and adaptation activities. These studies are concerned with the practice of farming; they seek to understand how changes in production practices can provide climate benefits.

Of the 39 studies we found:

- 10 percent included organic systems as a central component of the research.
- Nearly 50 percent of the studies examined the impacts of integrated biological farming systems.
- 33 percent of the studies explored water and energy efficiency and/or natural resource conservation.
- Reduced inputs were included in approximately 30 percent of the studies.
- Economic impacts were examined in approximately 40 percent of the studies.
- Social impacts were examined in only 15 percent of the studies.

B. Technical Assistance

We found that budget cuts have eliminated offices and reduced staffing levels for all branches of publicly funded technical service providers for agriculture. In summary:

- The number of on-farm Cooperative Extension advisors peaked in 1969 at 380 advisors, and the number of Cooperative Extension specialists peaked at 208 specialists in 1988. Today, there are only 200 Extension on-farm advisors and 119 specialists, down 40 percent since the early 1990s.
- In comparison, Texas, second in the country to California in agricultural product sales, has 900 county-based Extension specialists.
- State budget cuts have reduced staffing levels and programming for the Resource Conservation Districts.
- Staffing levels at the Natural Resource Conservation Service (NRCS) of the USDA are down 7 percent from 2005 to present, despite increased demands for farm bill conservation programs.

C. Direct Conservation Incentives

In our review of incentive programs for agricultural producers, we were concerned with access to direct incentives for agricultural producers. Highlights from our review include:

- Unlike other agricultural states, California lacks direct incentive programs for producers to adopt on-farm conservation programs.
- The USDA is the largest source of funding for agriculture conservation activities in the country. In 2009, 70 percent of the California farmers and ranchers who applied for USDA farm bill conservation programs were denied access to the programs because of a lack of funding.

Conclusion

California has made considerable progress towards understanding how climate change may impact the state's agriculture sector. But too few research studies have been conducted on how agriculture might respond effectively to reduce GHG emissions, sequester carbon and adapt to a changing climate. And fewer studies still take a sustainable and organic agricultural perspective. Moreover, the state's ability to provide technical assistance and conservation incentives for farmers and ranchers is woefully inadequate to meet the complex challenges of climate change after decades of budget cuts have reduced staffing levels and eliminated programs.

Recommendations

#1: Invest in California Agriculture

- Invest a portion of cap-and-trade auction revenue in research and demonstration, technical assistance and financial incentives for farmers and ranchers to adopt practices, technologies and farming systems that reduce GHG emissions, sequester carbon and adapt to climate change while providing environmental co-benefits such as improved air quality, water conservation and increased wildlife habitat.
- To oversee the implementation of this grants program, form an advisory committee made up of California researchers, agricultural producers, processors, nonprofit representatives and state and federal agency representatives with expertise in climate change and agriculture issues.

#2: Prioritize Whole Systems and Participatory Research

- Research that takes into account whole farm systems should be emphasized and sustainable and organic farming systems approaches should be included in future research projects.
- Researchers who work directly with producers to conduct their research should be especially encouraged.

#3: Build Bridges Between Researchers and Growers

- The state should re-invest in UC Cooperative Extension and Resource Conservation Districts with the eventual goal of returning to early 1990s staffing levels.
- Given the complexities of climate change, new and on-going training opportunities for farm advisors and specialists will be needed.
- Re-investment in the UC Sustainable Agriculture Research and Education Program (SAREP) is also needed to provide a hub for long-term farming research trials ongoing sustainable agriculture research and demonstration grants and relevant educational programming for producers and technical service providers.
- As state budget cuts threaten the ongoing viability of UC Cooperative Extension, these efforts should be funded by cap-and-trade revenue.

#4: Support Stewardship

- CDFA's Office of Agricultural and Environmental Stewardship (OAES), eliminated in 2009, should be reestablished and include new staff with climate change expertise. This office would build support for agricultural conservation practices among urban constituents and enhance understanding and cooperation with environmental and food advocates.

#5: Develop Conservation Incentives

- California can learn from other states like Wisconsin, Minnesota, Iowa and Pennsylvania that have developed direct producer incentives to support conservation goals.
- A reestablished OAES at CDFA should work with agency partners to develop a climate-oriented agricultural conservation incentive program, funded by cap-and-trade revenue.

#6: Comprehensively Address Agricultural Adaptation to Climate Change

- Create an Office of Climate Change Adaptation with an Agriculture Division.
- The office should be housed in either the Natural Resources Agency or the Governor's Office, using cap-and-trade revenue, state bond or federal funding to establish it.
- The office should include an Agriculture Division that prioritizes coordination with the California Air Resources Board and California Department of Food and Agriculture to provide research, technical assistance and cost sharing for farmers and ranchers to adopt practices that reduce agriculture's vulnerabilities to a changing climate.
- Given California's vulnerability to water scarcity, which will only increase as climate change impacts are realized, particular attention should be paid to expanding the use and diversity of water-conserving agricultural practices.



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