

ENVIRONMENTAL FARMING ACT SCIENCE ADVISORY PANEL (EFA SAP)
CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE



MEETING AGENDA
January 19, 2017

[Public Meeting](#)
9:30 AM to 4 PM
California Department of Food and Agriculture
Main Auditorium
1220 N Street, Sacramento, CA 95814
916-654-0433

REMOTE ACCESS

Webinar information

Registration URL: <https://attendee.gotowebinar.com/register/440078809406019329>

Webinar ID: 790-659-139

Please note the webinar is on listen-only mode. For verbal questions and comments, please attend the meeting in person. An opportunity to provide written comments following the meeting will be provided.

Presentation materials will be posted at the following link prior to the meeting:
https://www.cdfa.ca.gov/EnvironmentalStewardship/Meetings_Presentations.html

EFA SAP MEMBERSHIP

<https://www.cdfa.ca.gov/oefi/efasap/>

Don Cameron, Terranova Ranch, Member and Chair

David Bunn, PhD, Resources Agency, DOC, Member	Jocelyn Bridson, MSc, Rio Farms, Member
Emily Wimberger, CalEPA, ARB, Member	Jeff Dlott, PhD, SureHarvest, Member
Vicky Dawley, Tehama RCD, Member	Judith Redmond, Full Belly Farms, Member
Scott Couch, CalEPA, State Water Board, Member	Julie Alvis, Resources Agency, Member
Luana Kiger, MSc, Subject Matter Expert	
Doug Parker, PhD, Subject Matter Expert	

- | | |
|---|--|
| 1. Introductions | Chair Cameron |
| 2. Welcome message for new members | Karen Ross, Secretary
CDFA |
| 3. Minutes from previous meeting | |
| 4. The State Water Efficiency and Enhancement Program (SWEEP) <ul style="list-style-type: none">• Update on overall program• Update on next solicitation | Scott Weeks |
| 4. DWR-CDFA Joint Pilot Project <ul style="list-style-type: none">• Update on overall program | Martin Berbach (DWR) and
Carolyn Cook, MSc (CDFA) |
| 5. Healthy Soils Program <ul style="list-style-type: none">• Proposed programmatic framework for implementation• Timeline of activities• ARB quantification methodologies | Geetika Joshi, PhD (CDFA)

Bailey Smith (ARB) |
| 7. Public Comments on Healthy Soils Program | Chair Cameron |
| 8. Next meeting and location | Chair Cameron |

Amrith (Ami) Gunasekara, PhD, CDFA Liaison to the Science Panel

All meeting facilities are accessible to persons with disabilities. If you require reasonable accommodation as defined by the American with Disabilities Act, or if you have questions regarding this public meeting, please contact Amrith Gunasekara at (916) 654-0433.

More information at: <http://cdfa.ca.gov/Meetings.html> and http://www.cdfa.ca.gov/EnvironmentalStewardship/Meetings_Presentations.html

**CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE (CDFA)
ENVIRONMENTAL FARMING ACT SCIENCE ADVISORY PANEL**

University Cooperative Extension Office
1432 Abbott Street
Salinas, CA 93901

August 26, 2016
1 PM to 4 PM

MEETING MINUTES

Panel Members

Don Cameron, Member and Chair
Jocelyn Bridson, MSc., Member
David Mallory (ARB), Member
Jeff Dlott, PhD. Member
David Bunn (Bruce Gwynne) (Natural Resources Agency), Member
Doug Parker, PhD., Subject Matter Expert

State Agency Staff

Bailey Smith (ARB)
Bonnie Soriano (ARB)
Amrith Gunasekara, PhD., CDFA
Geetika Joshi, PhD., CDFA
Carolyn Cook, MSc. CDFA
Scott Weeks, CDFA
Katie Filippini, MSc. CDFA

AGENDA ITEM 1 - Introductions

The meeting was called to order at 1:10 PM by the Chair, Mr. Don Cameron. Introductions were made. Present at the meeting were all the members noted above under "Panel Members". A quorum was established.

AGENDA ITEM 2 - Updates

Minutes

Chairman Cameron introduced the minutes from the May 18, 2016 meeting. A motion was made by Ms. Bridson to accept the minutes as presented by CDFA staff and the motion was seconded by Mr. Gwynne representing Mr. Bunn. The motion was moved by all members present and accepted without further changes.

SWEEP - State Water Efficiency and Enhancement Program

Ms. Katie Filippini and Mr. Scott Weeks, new hires to the SWEEP, provided an update on the State Water Efficiency and Enhancement Program (SWEEP) including the most recent status of the ongoing drought, which is now in its fifth year. They noted recent developments with the latest June 2016 solicitation for applications. Application information was provided to the panel members; 268 completed grant applications totaling \$34 million with an average amount of \$128,000 per project requested. The funding cap was established at \$200,000 for this round. CDFA has \$17 million to allocate for projects. CDFA also provided an update on past SWEEP awards verification activities. Staff and Dr. Gunasekara facilitated questions from the members.

CDFA noted to the members that the California Climate Action Network had provided a report critically evaluating SWEEP including providing several recommendations on how to improve the program. CDFA staff noted that the report will be reviewed and recommendations taken into consideration for the next SWEEP solicitation.

Healthy Soils Incentive Program

Dr. Joshi provided an overview of a framework for a Healthy Soils Incentive Program if funding is allocated. The Healthy Soils Program will be designed to provide incentives to farms and ranchers to build carbon and reduce greenhouse gases on agricultural lands. The program will include a list of USDA NRCS practices that have quantified greenhouse gas reductions so growers could choose which practice to implement and obtain financial incentives for its implementation through the CDFA Healthy Soils Program. Discussion ensued including comments from the Science Panel members. Members noted that a one-page summary on each practice might be helpful to describe each practice, its benefits and also co-benefits. Comments from the public included discussion on grant award size and recognize benefits already being done by growers.

Compost Application Rates to Support the CDFA Healthy Soils Incentive Program

Dr. Gunasekara provided information through a presentation on the application of compost on agricultural lands to support a CDFA Healthy Soils Incentive Program. This work is a continuation of work completed through previous Science Panel meetings where a literature review, white paper report and public comment was facilitated to establish compost use application rates to support a CDFA Incentive Program that is designed to build soil organic matter in California agricultural operations. CDFA has made several changes to the white paper report since the May 2016 Science Panel meeting. Those changes were presented to the members and were based on public comment letters. A comparison of the initially proposed application rates for compost on cropland and rangeland were presented along with another table showing the changes. Members noted that the conventional and organic rates were the same and therefore suggested combining those categories together might be helpful and lead to less confusion. Mr. Gwynne, representing Dr. Bunn, noted the importance of maintaining native plant communities as compost is added to working lands. These application rates

are not regulatory requirements; rather they are the rates that will be incentivized through financial support as part of the CDFA Healthy Soils Incentive Program. Dr. Gunasekara noted that additional compost can be applied beyond what will be incentivized by CDFA. Public comment was facilitated. Members moved to accept the final report. A motion was made by Mr. Gwynne representing Dr. Bunn from the Natural Resources Agency. The motion was seconded by Mr. Jeff Dlott. The motion was moved by all members present and accepted without further changes.

AGENDA ITEM 3
Informational Presentations

Two informational presentations were included in this agenda. They included a presentation by Dr. Parameswaran on work that is being completed through Trace Genomics to evaluate the health of soil through microbial genomics.

Mr. Adar and Dr. Shoub provided an informational presentation on AutoAgronom which focuses on the development of plant root systems which improve overall plant growth.

AGENDA ITEM 4 and 5 – Public Comment and future meetings

Public comment was facilitated followed by discussion. The date and location of the next meeting is November 18, 2016 and will be in Modesto, California. Chair Cameron adjourned the meeting at 4:35 PM.

Respectfully submitted by:

Amrith Gunasekara, Ph.D.

Date

**CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE (CDFA)
ENVIRONMENTAL FARMING ACT SCIENCE ADVISORY PANEL**

Stanislaus County
Agricultural Commissioner Office
3800 Cornucopia Way, Room A
Modesto, CA 95358

November 18, 2016
1 PM to 5 PM

MEETING MINUTES

Panel Members

Don Cameron, Member and Chair
Jocelyn Bridson, MSc., Member
David Mallory (ARB), Member
Jeff Dlott, PhD. Member (phone)
Judith Redmond, Member
David Bunn, PhD. (Bruce Gwynne) (Natural Resources Agency), Member
Doug Parker, PhD., Subject Matter Expert
Luana Kiger, Subject Matter Expert (phone)

State Agency Staff

Bailey Smith (ARB)
Bonnie Soriano (ARB)
Amrith Gunasekara, PhD., CDFA
Geetika Joshi, PhD., CDFA
Carolyn Cook, MSc. CDFA
Scott Weeks, CDFA
Martin Berbach, DWR

AGENDA ITEM 1 - Introductions

The meeting was called to order at 1:02 PM by the Chair, Mr. Don Cameron. Introductions were made. Present at the meeting were all the members noted above under "Panel Members". A quorum was established.

AGENDA ITEM 2 - Updates

Minutes

Dr. Gunasekara noted that minutes from the last meeting in August will be presented at the January Science Panel meeting given several recent edits. Dr. Gunasekara noted that recent legislation had increased the membership on the panel from five members to

nine members. All new members will join the panel for the first time at the January, 2017 Science Panel meeting in Sacramento.

AGENDA ITEM 3 - Healthy Soils Incentive Program

Dr. Joshi provided an overview of a framework for a Healthy Soils Incentive Program. She noted that in September, 2016, CDFA received \$7.5 million from the Climate Investments Programs in the recent 2015-2016 state budget. The Healthy Soils Program will be designed to provide incentives to farms and ranchers to build carbon and reduce greenhouse gases on agricultural lands. The program will include a list of USDA NRCS practices that have quantified greenhouse gas reductions so growers could choose which practice to implement and obtain financial incentives for its implementation through the CDFA Healthy Soils Program. Discussion ensued including comments from the Science Panel members. Questions by Ms. Redmond on compost use and rates as part of a CDFA Healthy Soils Program were facilitated. Comments from the public were also facilitated.

AGENDA ITEM 4 - State Water Efficiency and Enhancement Program (SWEEP)

Mr. Scott Weeks, provided an update on the State Water Efficiency and Enhancement Program (SWEEP). Application numbers for the most recent round of SWEEP were provided for informational purposes. He noted that CDFA had received an additional \$7.5 million as part of the state budget which was moved in September, 2016. CDFA suggested to the Science Panel that reducing the total grand award size from \$200,000 to \$100,000 would suit the next solicitation better, given the smaller amount of funds allocated to SWEEP compared to previous awards (e.g., \$7.5 million in 2016 compared to \$40 million in 2015). CDFA had also received comments from several stakeholders and these comments were summarized and discussed at the Science Panel meeting. Mr. Weeks noted that CDFA SWEEP staff is engaging on a media project to highlight the benefits of SWEEP and improve the programs visibility. CDFA was encouraged to highlight a diversity of farmers including women and growers in disadvantaged communities. Mr. Weeks and Dr. Gunasekara facilitated questions from the members and the public. Mr. Cameron suggested surveying the applicants and recipients of SWEEP to understand the barriers, ease of use for water and greenhouse gas calculations and technical assistance needs.

Ms. Smith provided an update on the Quantification Methodology (QM) for the next solicitation of SWEEP. She noted recent updates and changes to the QM tool that supports the program's application requirements. The QM public comment period was November 18, 2016 to December 2, 2016 and stakeholders and the public were open to comments on numerous aspects of the tool.

A motion was requested by Dr. Gunasekara on the total award amount per application. The suggestion by CDFA was to reduce the total award amount from \$200,000 to \$100,000. A motion was made by Mr. Gwynne and seconded by Mr. Mallory. Public comment was facilitated. The motion was passed by all members present.

AGENDA ITEM 5 – DWR-CDFA Joint Pilot Project

Mr. Berbach and Ms. Cook provided an update on the DWR-CDFA joint pilot project involving funding for both agricultural water suppliers and agricultural operations. The pilot grant program will combine \$3 million in funding from DWR's Proposition 1 fund for agricultural water suppliers to pressurize the delivery of water directly to growers. This will modernize water deliveries to match technological upgrades by growers to create more efficient irrigation systems. CDFA's State Water Efficiency and Enhancement Program will provide an additional \$3 million for growers to receive that water and utilize it through technologies such as drip, subsurface drip, and micro-sprinkler irrigation systems. Water suppliers will be responsible for submitting the applications and this pilot project requires a 50% cost share unless Disadvantaged Communities (DAC) or Economically Distressed Areas (EDA) status is claimed and documented. Ms. Smith provided information on the ARB Quantification Methodology developed for the program. A timeline of activities was also provided for this program.

AGENDA ITEM 6 – Habitat Exchange Program

Dr. Gunasekara noted that he was unable to secure staff from the Environmental Defense Fund to speak on this program due to previous engagements and will work to include the topic in future meetings.

AGENDA ITEM 7 – Public Comment and future meetings

Public comment was facilitated and followed by discussion. The date and location of the next meeting is January 19, 2017, and will be in Sacramento, California. Chair Cameron adjourned the meeting at 4:10 PM.

Respectfully submitted by:

Amrith Gunasekara, Ph.D.

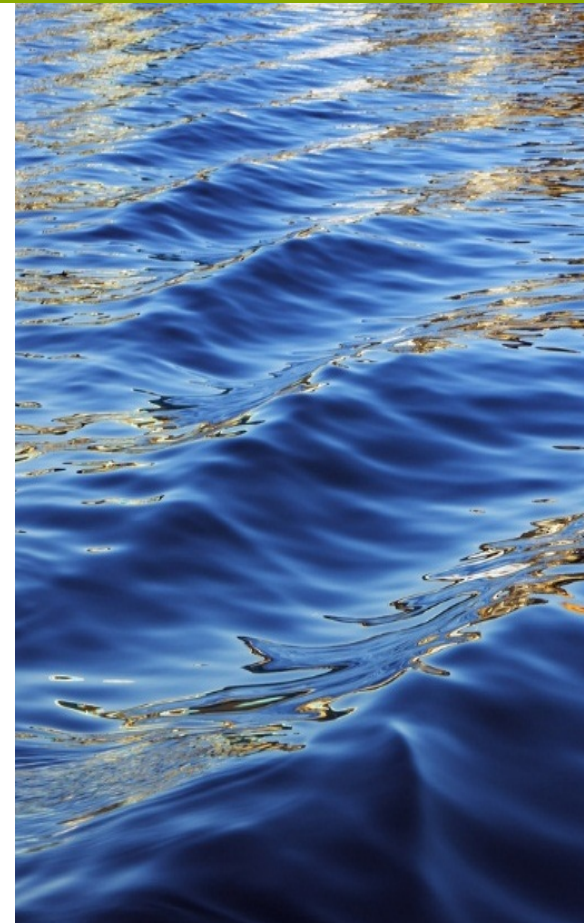
Date

SWEEP UPDATE

EFA SCIENTIFIC ADVISORY PANEL

January 19th 2017

Scott Weeks
Environmental Scientist



CALIFORNIA DEPARTMENT OF
FOOD & AGRICULTURE

SWEEP BACKGROUND

- **\$10 million: Emergency Drought Legislation Bill** - SB 103 signed by Governor Brown on March 1, 2014
- **\$10 million: AB 91** allocated additional funds March 27, 2015
- **\$40 million: Budget Act of 2015**, Item 8570-001-3228 (Chapter 321, Statutes of 2015) appropriate funds from the Greenhouse Gas Reduction Fund
- **7.5 million: AB1613** (Chapter 370, Statutes 2016)



*“...to invest in irrigation and water pumping systems that **reduce water use, energy use and greenhouse gas emissions.**”*

SWEEP AUTHORITY

- **Environmental Farming Act of 1995**

Division 1, Part 1, Chapter 3, Article 8.5, Sections 560-568, Section 566 (a)

“The department shall establish and oversee an environmental farming program. **The program shall provide incentives to farmers whose practices promote the well-being of ecosystems, air quality, and wildlife and their habitat”**



PROJECT TYPES



Water Conservation

- Sensors for Irrigation Scheduling (*weather, soil or plant based*)
- Micro-Irrigation or Drip Systems

AND



GHG Reductions

- Fuel Conversion
- Improved Energy Efficiency
- Low Pressure Systems
- Variable Frequency Drives
- Reduced Pumping



SWEEP 2016 ROUND 1



FUNDING

- \$16 million awarded
- \$9.5 million in matching funds



ACREAGE

- 128 projects
- 27,300-acres impacted
- 213-acres average project size



BENEFITS

- GHG Reductions: 5,635 MT CO₂e/yr
- Water Savings: 1541 ac-ft/yr

SWEEP 2016 ROUND 2



FUNDING

- \$22 million awarded
- \$11 million in matching funds



ACREAGE

- 167 projects
- 31,949 acres impacted
- 191 acres average project size

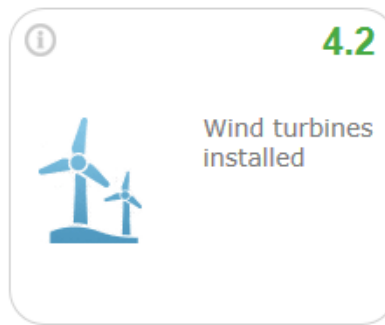
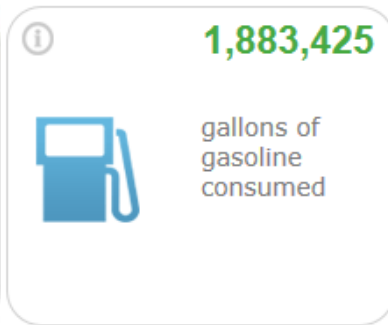


BENEFITS

- GHG Reductions: 11,103 MT CO₂e/yr
- Water Savings: 2220 ac-ft/yr

SWEEP 2016 Rd1 & Rd2

- Awarded \$38 million with \$20.5 million in matching funds
- 305 Projects with 59,249 acres impacted
- GHG Reduction equivalent to taking 3536 cars off the road
- Water Savings of 1855 Olympic Swimming pools



GHG Reduction Equivalency




Water Savings Equivalency

SWEEP 2017

- \$7.5 million from AB1613
- Reduction of total grant from \$200,000 → \$100,000
 - More project with less money
- New and Improved Calculators
 - SWEEP Irrigation Water Savings Assessment Tool
 - SWEEP GHG Emission Reduction Calculator



APPLICATION REQUIREMENTS

- Applicants must establish a baseline water use and GHG emissions from the current system and project savings due to the project. Supporting documentation is required including:
 - Energy bills
 - Water Use Calculator Tool
 - Pump Tests

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graph LR; A[Energy bills] --- B[Water Use Calculator Tool]; A --- C[Pump Tests]; B --- D[ARB GHG Calculator Tool]; C --- D;
```
- Awardees must maintain records for 3 years and agree to verifications site visit

SWEEP 2017 TIMELINE

Item	Proposed Dates*
Request for Applications (RFA) released	January 31 st
Grant Application Workshops (CDFA)	February 6 th - 10 th
Application Workshops (3 rd Party)	February 13 th - March 13 th
Last day to submit application	March 14 th
Announce Awardees	May

TECHNICAL ASSISTANCE WORKSHOPS

\$25,000

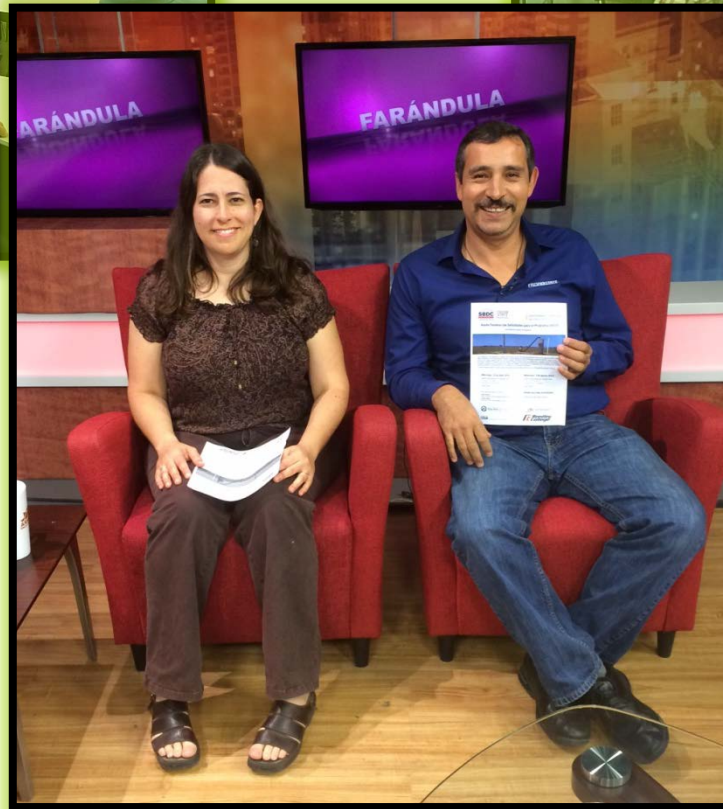
- Currently accepting applications for Technical Assistance Workshops
- \$2,500-5,000 per institution
- News Release on January 13, 2017

Required

- Have an Irrigation systems expert available
- Internet access for applicant assistance
- Having at least one workshop in a DAC

TECHNICAL ASSISTANCE WORKSHOP

UC Cooperative Extension Fresno



Ruth Dahlquist- Willard and Felipe Perez



These Fresno Technical Assistance Workshops were taught in three languages (Hmong, Spanish, and English) Incorporated Univision TV and directly impacted 60 individuals

AWARDED PROJECT EXAMPLE

Henry Pruitt Anderson, III SWEEP Project \$150,000 - Tulare CA

80 Acres of almonds

- Changing from flood to drip irrigation
 - Installation of soil moisture sensors and weather stations
 - Solar array and VFD and flowmeter
-
- Estimated Water Savings of **23.9 acre in/year/acre**
 - GHG Savings of **0.0130 MT CO₂e/year/acre**



Flow meter



Solar Array



Double lined drip irrigation

COLLABORATION WITH RESOURCE CONSERVATION DISTRICT



- Contracted with the RCDs to conduct onsite project verifications
- RCDs verify projects were implemented in accordance with the Grant Agreement SOW and take photos of project components



Brian Hockett, NW Kern RCD

Thank you for the time and your attention

Scott Weeks – Environmental Scientist, CDFA
Scott.Weeks@cdfa.ca.gov

Carolyn Cook – Senior Environmental Scientist, CDFA

Crystal Myers – Office of Grants Administration, CDFA

Kyle Montero– Office of Grants Administration, CDFA

Geetika Joshi - Senior Environmental Scientist, CDFA

Amrith (Ami) Gunasekara – Manager, OEFI, CDFA



Agricultural Water Use Management Program & SWEEP

**A Joint Department of Water Resources and
Department of Food and Agriculture Project
Update to the EFA Science Advisory Panel**

January 19, 2017



The Joint Program

The grant funding provided in this joint program is intended to address multiple goals including:

- 1) Water use efficiency, conservation and reduction
- 2) Greenhouse gas emission reductions
- 3) Groundwater protection
- 4) Sustainability of agricultural operations and food production.

It is also anticipated that there will be benefits to water and air quality, groundwater security, surface water conservation, and improved nutrient management and crop health through this program

The Joint Program

A program to:

1. Incentivize the pressurization of the delivery of water to farms
2. Facilitate the use of surface water on farms where currently groundwater is the main source for irrigation
3. Incentivize efficient on-farm irrigation systems that increase water use efficiency and reduce greenhouse gases
4. Encourage the use of on-farm water management tools such as soil moisture sensors, plant sensors and weather stations.

The Joint Program and Funding

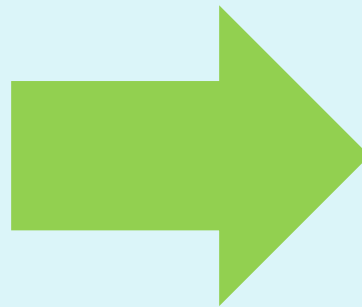


Conveyance

Funded by DWR
Prop 1 funding - \$3
million



The Joint Program - DWR



The Joint Program - CDFA



Application Process

1. One application from agricultural water supplier with farmer applications included
2. Show significant decrease in use of on-farm groundwater pumps to reduce GHGs
3. Water and GHG savings to be quantified by agricultural water supplier through the use of a GHG Calculator developed by the CA Air Resources Board

https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/cdfa_jointsweep_finalqm_16-17.pdf (PDF)

https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/cdfa_jointsweep_finalcalc_16-17.xlsx (.xlsx)

Timeline

Activity	Date
Draft Request for Applications Released	August 26, 2016
Public Comment Workshops	September 27, 28, & 29, 2016
Public Comment Period Closed	September 30, 2016
Release of Final Request for Applications	January 17, 2017
Application Workshop	January 23, 2017
Applications Due	April 21, 2017

THANKS.....



<http://www.water.ca.gov/wuegrants/AgWUEPilot.cfm>

Contacts

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Carolyn Cook, CDFA Carolyn.Cook@cdfa.ca.gov

Amrith Gunasekara, CDFA Amrith.Gunasekara@cdfa.ca.gov



HEALTHY SOILS INCENTIVES PROGRAM

Geetika Joshi, PhD
Senior Environmental Scientist

*ENVIRONMENTAL FARMING ACT – SCIENCE ADVISORY PANEL
JANUARY 19, 2017
SACRAMENTO*

PRESENTATION OUTLINE

- Healthy Soils Initiative
- Healthy Soils Program
 - Objective & Funding
 - Program Development Process
 - Draft program framework including:
 - Current status
 - Allocation of funds to incentive and demonstration projects, proposed award amounts
 - Potential management practices for incentives program
 - Timeline

HEALTHY SOILS INITIATIVE

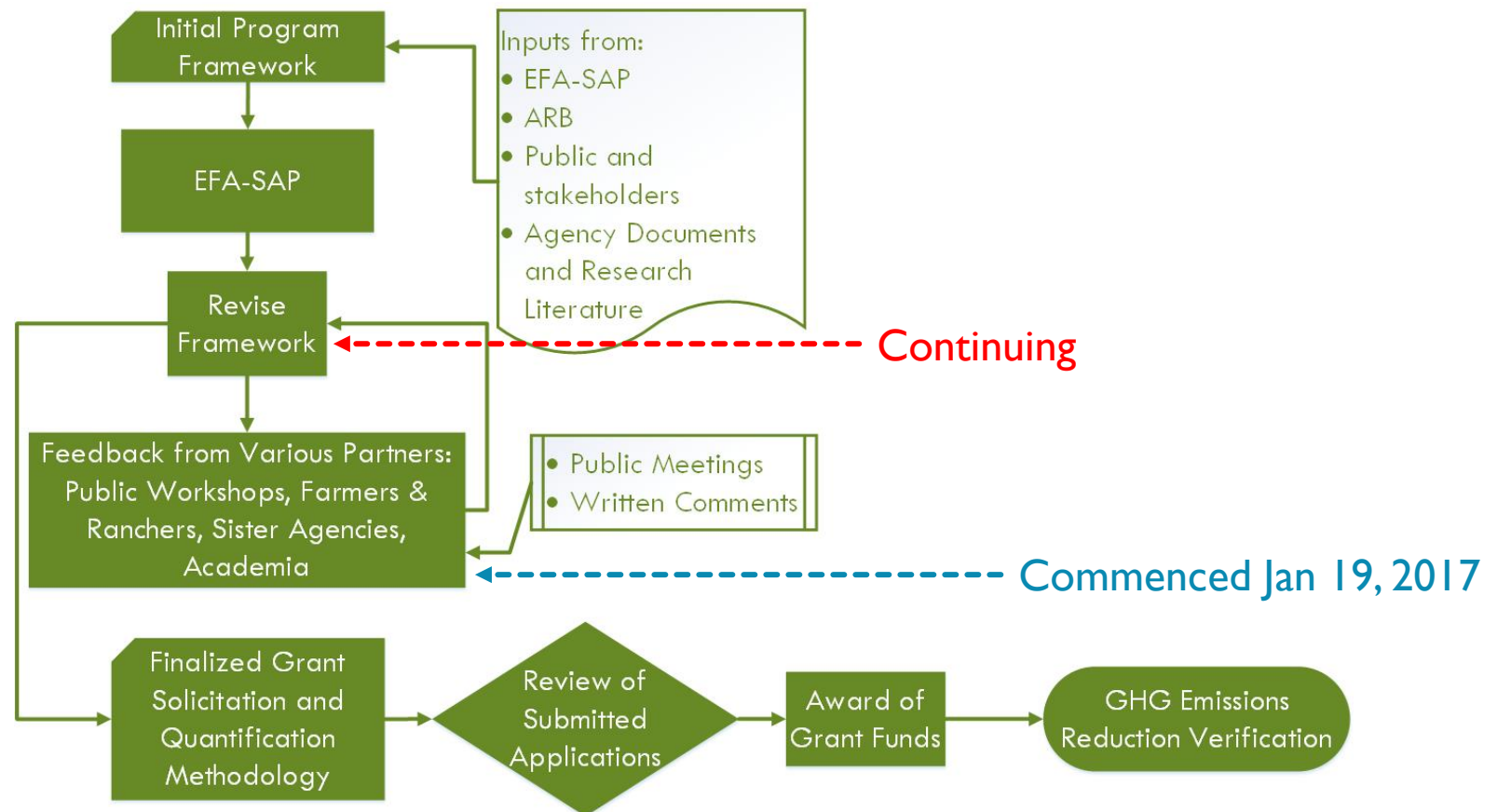
- More than 400 agricultural commodities in California, including unique specialty crops.
- California remained the No. 1 state in cash farm receipts in 2015, with \$47 billion in revenue from 76,400 farms and ranchers (#1 for more than 50 years).
- Some of the most fertile and diverse agricultural soils: soils are fundamental plant growing medium.
- 2015: United Nations declared International Year of Soils.
- Meeting with Governor's Office and administration on initiative.
- Interagency meetings with several agencies and departments:
 - CalEPA; DPR, CalRecycle, State Water Resources Control Board, Regional Water Quality Control Boards; Natural Resources Agency; Department of Conservation, SGC
- Webpage and list-serv for California Healthy Soils Initiative; short and long term actions document: (insert weblink)



HEALTHY SOILS PROGRAM: OBJECTIVE AND FUNDING

- *Objective:* To build soil carbon and reduce agricultural GHG emissions through incentives.
- CDFA appropriated \$7.5 million in FY 2016-17 to develop and administer a new incentive and demonstration program on the CA Healthy Soils Initiative from the Greenhouse Gas Reduction Fund.
- Funds must be encumbered by June 30, 2018 and expended/liquidated by June 30, 2020 (AB 1613, Section 13).
- Funds allocation:
 - Incentive projects (50%; \$3.75M)
 - Demonstration projects (40%; \$3M).
 - Remainder funds: administrative cost (10%; \$0.75M)

PROGRAM DEVELOPMENT PROCESS



FRAMEWORK PROPOSED FOR DISCUSSION: INCENTIVES PROGRAM - ELIGIBILITY

- Eligibility: California farmers and ranchers. Projects must be located in CA and result in GHG reductions from agricultural practices for a specified time period, quantifiable using a method determined by ARB.
- Projects funded under this solicitation to use one or more of the eligible **USDA-NRCS Conservation Practice Standards** identified in the grant solicitation, and/or compost application.
- An agricultural operation to only submit one application using a unique tax identification number per round of funding to allow wide distribution of funds.
- Proposed award amount: Maximum \$25,000 per project (approx. 150 projects supported).

MANAGEMENT PRACTICES TENTATIVELY INCLUDED FOR INCENTIVES

Tentatively included:

- Improved Fertilizer Management (590a)
- Mulching (484)
- Cropland Compost Application (Not an NRCS Practice)
- Grassland Compost Application (Not an NRCS Practice)
- Herbaceous Cover:
 - Herbaceous Wind Barriers (603)
 - Vegetative Barriers (601)
 - Riparian Herbaceous Cover (390)
 - Contour Buffer Strips (332)
 - Field Border (386)
 - Filter Strip (393)
- Woody Cover:
 - Windbreak/ shelterbelt establishment/renovation (380)
 - Riparian Forest Buffer (391)
 - Hedgerow Planting (422)
 - Silvopasture (381)

QUANTIFICATION METHODOLOGY FOR GHG EMISSION REDUCTIONS

- Per SB 862, the California Air Resources Board (ARB) is required to develop quantification methods (QM) for agencies receiving Greenhouse Gas Reduction Fund (GGRF) appropriations.
- ARB, in collaboration with CDFA, is developing the QM Tool.
 - To be presented in next section.

FRAMEWORK PROPOSED FOR DISCUSSION: INCENTIVES PROGRAM – APPLICATION

- Applicant would provide information including but not limited to:
 - Description of the proposed project.
 - Estimation of greenhouse gas (GHG) reductions according to an ARB approved methodology developed in consultation with CDFA:
 - Include baseline estimates and supporting documentation.
 - Specify the life of the project and how GHG emission reductions will continue to occur over the required timeframe.
- In finalized grant solicitations, CDFA and ARB will provide additional guidance for ongoing tracking and reporting of net GHG benefits from project activities.

FRAMEWORK PROPOSED FOR DISCUSSION: INCENTIVES PROGRAM – CO-BENEFITS

- CDFA will generate a list of co-benefits to be given additional consideration during application review.
- Benefits to disadvantaged communities (DACs) – based on ARB guidance.

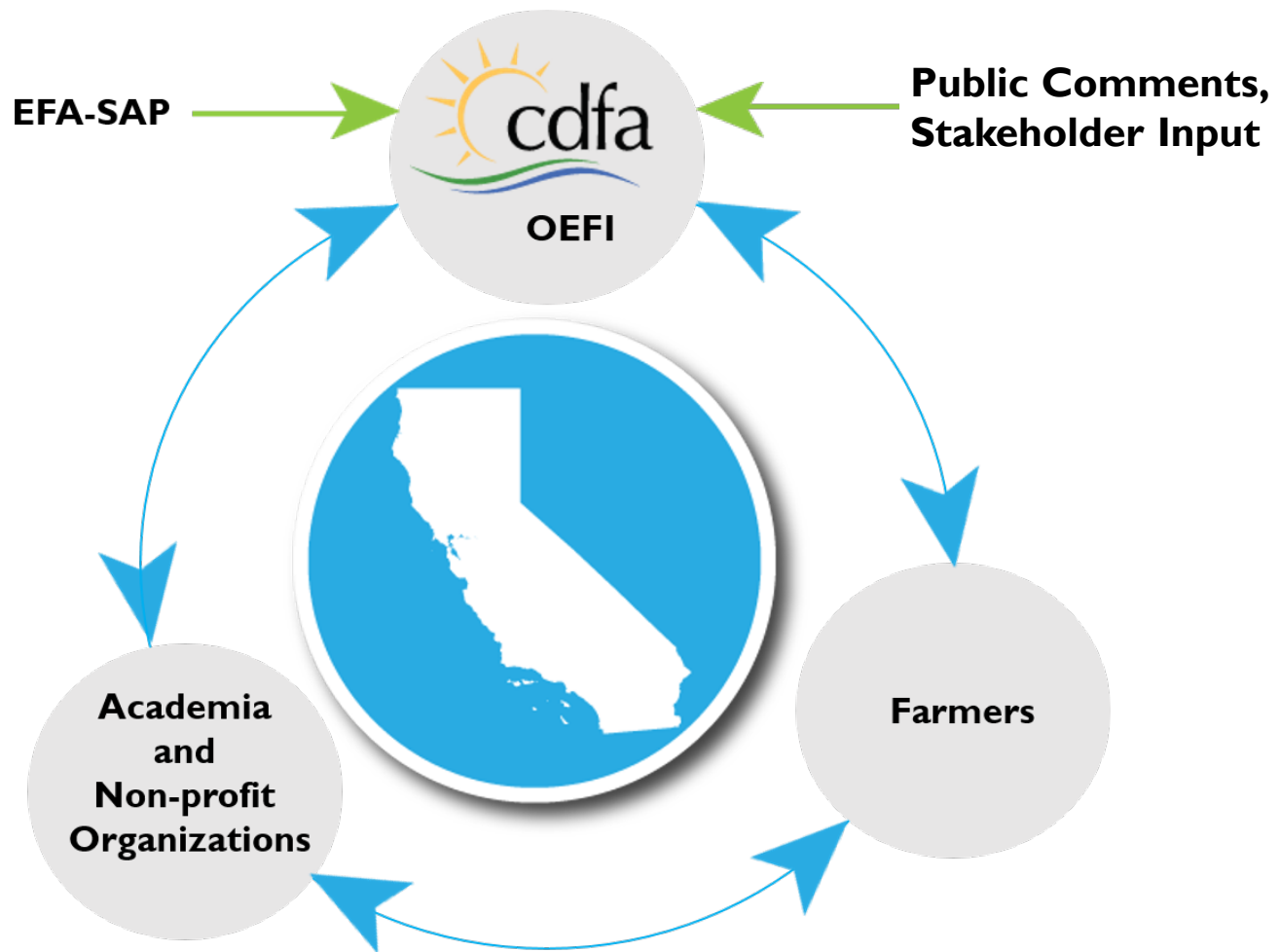
FRAMEWORK PROPOSED FOR DISCUSSION: INCENTIVES PROGRAM – TENTATIVE TIMELINE

ITEM	ESTIMATED DATES
Program framework development including Quantification Methodology	Nov 2016 – Apr 2017
Public Stakeholder Meetings for Program Design Feedback	Jan 2017 – Apr 2017
Grant solicitation released	May 2017
Applications proposals due	Jun 2017
Proposal evaluation (Technical Review)	Jun – Sep 2017
Announce grant awardees	Sep 2017
Project Implementation to begin	Oct 2017

FRAMEWORK PROPOSED FOR DISCUSSION: DEMONSTRATION PROJECTS

- **Objective:** Provide funding for projects that achieve net GHG benefits from soil carbon sequestration or GHG emissions reduction in the field.
- **Individual grant amount:** Proposed maximum \$250,000 per project (approx. 12 projects).
- **Eligibility:**
 - Projects *must* have field/on-farm component with quantifiable GHG emission reductions
 - Partnerships: Ag Operations/Industry Groups + Academia and/or Non-profit organizations and/or RCDs
 - Outreach and education component (e.g. Field Day) required.
 - In finalized grant solicitations, CDFA and ARB will provide additional guidance for ongoing tracking and reporting of net GHG benefits from project activities

PARTNERSHIPS FOR SOIL HEALTH THROUGH PROPOSED INCENTIVES PROGRAM



PROGRAM CONTACTS

Geetika Joshi, Ph.D.

Senior Environmental Scientist

Geetika.Joshi@cdfa.ca.gov

Amrith Gunasekara. Ph.D.

Science Advisor to CDFA Secretary

Manager, Office of Environmental Farming and Innovation

Amrith.Gunasekara@cdfa.ca.gov

CDFA Healthy Soils Program FY 2016-17



Quantification Methodology Development
Status

January 19, 2017



Background

- ARB is required by statute to develop quantification methodologies (QM) for Greenhouse Gas Reduction Fund (GGRF) projects
- QMs provide a mechanism to *estimate* the net GHG benefits from project implementation
- Net GHG benefits may result from:
 - Soil carbon benefits (CO₂) from storage and/or sequestration
 - Nitrous oxide (N₂O) emission reductions
 - Methane (CH₄) emission reductions
- Rely on best available science and external expertise

QM Development Principles

- **Greenhouse Gas Reduction Fund**
 - Applies at the project-level
 - Aligns with the project-types proposed for funding.
 - Estimates GHG benefits from direct, on-site practices
 - Based on scientifically sound, peer reviewed methods
- **Healthy Soils Program**
 - Includes CA land use management practices
 - Aligns with USDA/NRCS incentives and management practices
 - Available across CA cropping systems
 - Balance analytical rigor with ease-of-use

QM Development Process

Status	Task
✓	<ul style="list-style-type: none">• Select eligible conservation management practices (CMPs)
	<ul style="list-style-type: none">• Identify and evaluate existing and available resources and assessment tools
→	<ul style="list-style-type: none">• Identify resource gaps
	<ul style="list-style-type: none">• Develop comprehensive QM
Q1/Q2 2017	<ul style="list-style-type: none">• Automate QM - develop or adapt as needed an easy to use tool
	<ul style="list-style-type: none">• QM review and public process
	<ul style="list-style-type: none">• Provide QM resources to applicants

Quantification Approach

Selection of Conservation Practices

CDFA and ARB have identified CMPs with potential GHG benefits.



Project Quantification

Project-level quantification of net GHG benefits based on selected conservation management practices.



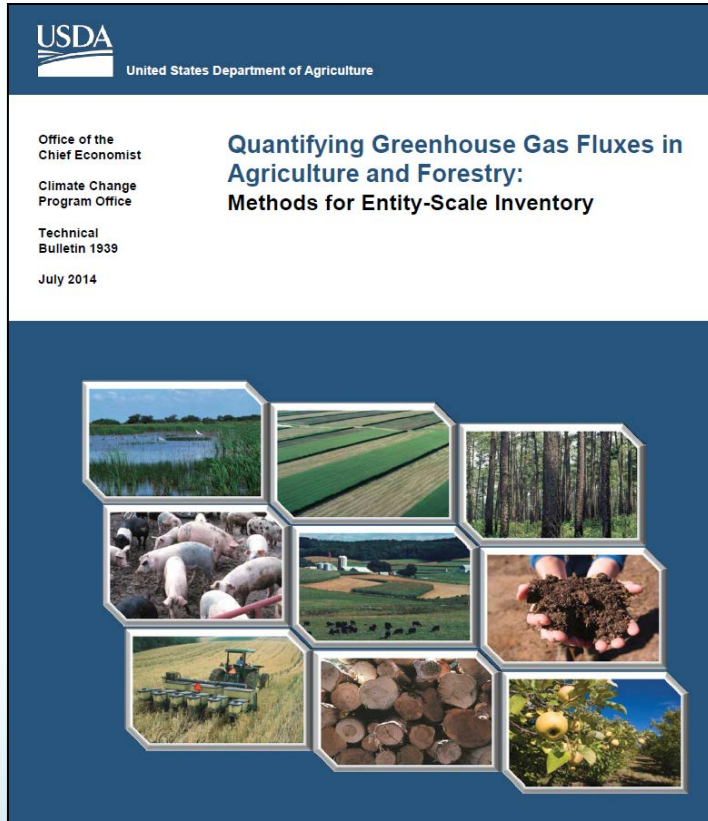
Project Implementation

Applicants implement conservation management practices according to Healthy Soils Incentive Program specifications.

Practices Included in Healthy Soils Program (NRCS Conservation Practice Standard)

Cropland Management	Cropland to Herbaceous Cover	Cropland to Woody Cover
<ul style="list-style-type: none"> • No-till (329) • Reduced-till (345) • Cover Crops (340) • Mulching (484) • Improved Fertilizer Management (590) • Cropland Compost-CDFA • Grassland Compost-CDFA 	<ul style="list-style-type: none"> • Herbaceous Wind Barriers (603) • Vegetative Barriers (601) • Riparian Herbaceous Cover (603) • Contour Buffer Strips (332) • Field Border (386) • Field Strip (393) 	<ul style="list-style-type: none"> • Windbreak/ Shelterbelt Establishment (380) • Riparian Forest Buffer (391) • Hedgerow Planting (422) • Silvopasture (381)

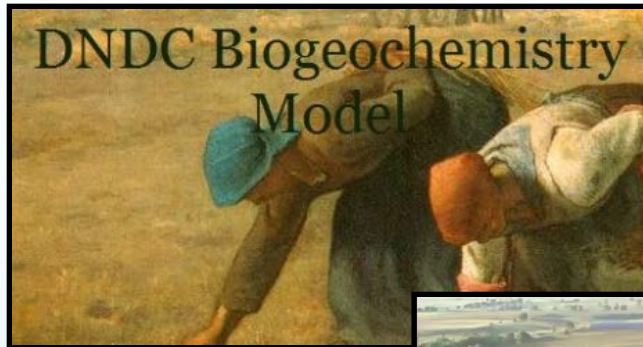
USDA Quantitative Methods



- Designed for farm-scale application
- Standard set of GHG estimation methods
- Nationally applicable methodology
- Can be used for most of the selected practices

Identify and Evaluate QM Resources and Assessment Tools

- Quantification Methodologies
 - *USDA Quantifying GHG Fluxes*: Widely accepted standard set of GHG estimation methods for use by USDA, landowners, and other stakeholders
- Assessment Tools and Models

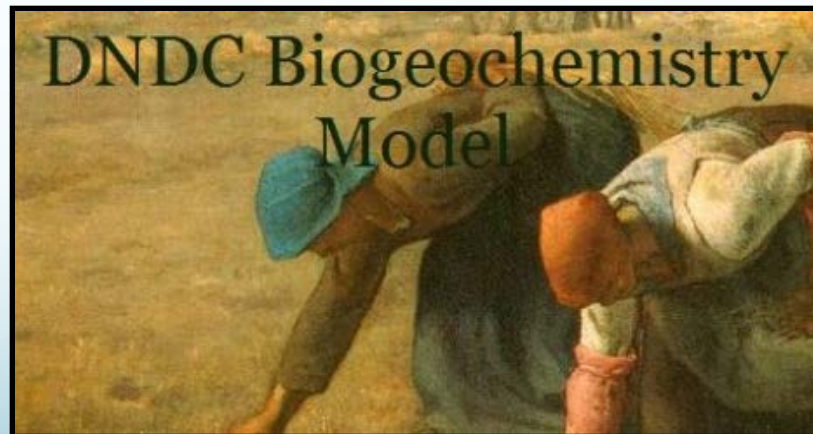
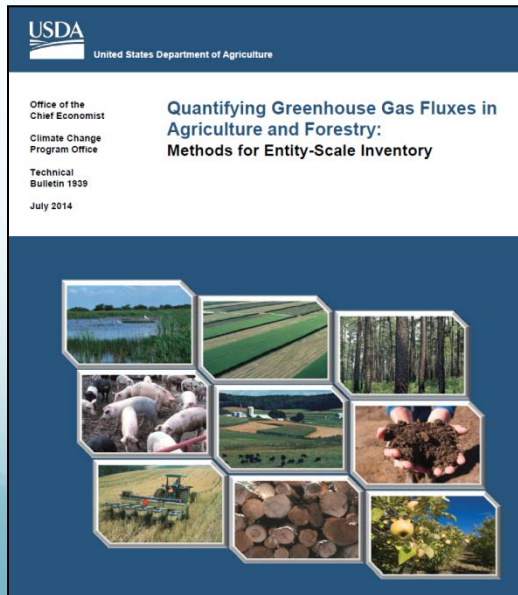


QM Framework

- Evaluating two approaches consistent with USDA's Quantitative Methods
 - **USDA Quantitative Methods + DNDC**
Supported by DNDC model for nitrogen
 - **COMET Planner Update**
Consistent with USDA Methods and supported by DAYCENT model
- Identifying resource gaps
 - Compost application (Not a NRCS Conservation Practice)



QM Framework - Option

- USDA Quantitative Methods + DNDC
 - NRCS cropland management practices and compost
 - CA specific soils, climate, and crop categories
 - Model runs provide a lookup table by practice, county, and crop category
 - GHG estimates for each practice provided through automated tool based on lookup tables



QM Framework – Option

- USDA Quantitative Methods + DNDC

 California Climate Investments Healthy Soils GHG Calculator Tool To Determine Greenhouse Gas Emission Reductions From California Department of Food and Agriculture (CDFA) Healthy Soils Initiative California Environmental Protection Agency 						
Project Location	23565 Shoreline Hwy Flumville, CA 95468					
Project County	Mendocino					
Climate Type	Warm Temperate Moist					
Soil Type	Low Activity Clay Soils					
Input Data for Healthy Soils Practices						
Practice Number	Practice	Practice Area (acres)	Years Implemented	Crop Type	C:N Ratio	GHG Reduction MT-CO ₂ e/yr
1	CPS 329: Conventional Tillage to No-Till	400	3	Non-legume Hay		18
2	CDFA: Cropland Compost Application	400	3	Non-legume Hay	> 11	273

Example inputs/outputs for demonstration purposes only

Crop	Cover Crop (Rye)	Cover Crop (Pea)	15% N Reduct	N Inhibit	15% N Reduct + Inhibit	High N Compost	Low N Compost	No Till	Reduced Till	Range-land Compost
Alfalfa						301	650			
Beans	299	148	39	87	125	317	674	157		
Berries			182	180	315	213	574	276	60	
Corn and sorghum	385	183	206	669	781	257	631	87		
Cotton	141	78	25	31	59	189	584	175		
Floral & Leafy Vegetables	72	36	14	23	36	78	429	196	84	
Fruit trees	191	156	20	35	52	195	538	97		
Fruit vegetables	242	153	45	49	83	165	541	170	39	
Non-legume Hay	108	43	36	194	214	320	682	44		
Nut trees	166	115	28	91	104	188	530			
Pasture			16	108	118	184	529			
Rangeland										537
Rice			48	120	163					
Root vegetables	132	124	35	46	69	135	488	122	22	
Safflowers and sunflowers	184	177	31	35	59	166	519			
Squashes and melons	86	73	24	33	58	225	573	237	47	
Stem vegetables	127	76	23	43	65	148	510	147	24	
Wheats			40	117	144	150	510	113		

USDA+DNDC Emissions Reductions kg-CO₂e/ac./yr.

QM Framework - Option

- COMET-Planner 2017 Update
 - In progress
 - Consistent with USDA Quantitative Methods
 - Uses COMET-Farm functionality, based on DAYCENT modeling
 - Updated for California to include MLRA, soil types, climate, and cropping systems

The screenshot displays the COMET Planner web interface. At the top, it features logos for the USDA, United States Department of Agriculture, Natural Resources Conservation Service, and Colorado State. A banner reads "EVALUATE POTENTIAL CARBON SEQUESTRATION AND GREENHOUSE GAS REDUCTIONS FROM ADOPTING NRCS CONSERVATION PRACTICES" with a "CLICK TO VIEW INTRODUCTION VIDEO" button. Below this, a text box explains that the NRCS Conservation Practices included are based on a qualitative greenhouse benefits ranking. The interface is divided into three steps: Step 1: "Begin by Naming your project and selecting your state and county" with input fields for Project Name, State (CA), and County (Mendocino). Step 2: "Select the class of conservation practices that best describes the practice you would like to evaluate" with five icons: Cropland Management, Grazing Lands, Woody Plantings, Cropland To Herbaceous Cover, and Restoration Of Disturbed Lands. Step 3: "Select a NRCS Conservation Practice Standard and a Practice Implementation that best describes your system. You may add multiple practices if you would like to add a practice under a different class of practices, return to Step 2."

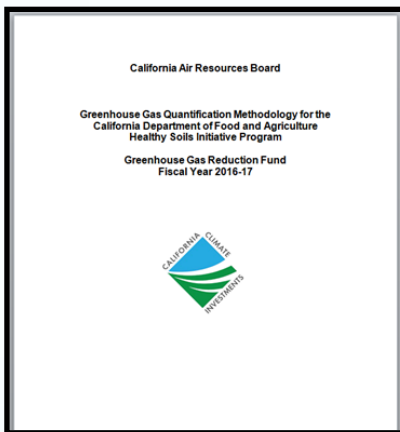
QM Framework - Option

- COMET-Planner 2017 Update – example output

	Enter Acreage	Carbon Dioxide	Nitrous Oxide	Methane	Total CO ₂ -Equivalent
NRCS Conservation Practices (Click Practice Name for Documentation)					
Windbreak/Shelterbelt Establishment (CPS 380) - Replace a Strip of Cropland with Woody Plants [delete]	50 ac	310	16	N.E. ²	330
Cover Crop (CPS 340) - Add Legume Seasonal Cover Crop to Irrigated Cropland [delete]	950 ac	290	-130	0	160
	Total	600	-114	0	486

Quantification Tools Provided to Applicants

- Document + calculator tool will be posted <https://www.arb.ca.gov/cci-quantification>



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- Quantification assistance available – questions about the tool can be directed to GGRFprogram@arb.ca.gov
- QM development includes a public process

Next Steps

- Beta-test COMET-Planner update and review technical documentation
- Finalize draft QM and easy-to-use tool
- Facilitate public comment process in coordination with CDFA
- Provide status updates and QM development to EFA-SAP

