

Farmer- and Rancher-Led Climate Change Solutions Stakeholder Meetings

Livestock and Dairy Session 1

Amrith (Ami) Gunasekara, PhD.

SCIENCE ADVISOR TO THE SECRETARY

MANAGER, OFFICE OF ENVIRONMENTAL FARMING AND INNOVATION

Amrith.Gunasekara@cdfa.ca.gov





Image from: https://www.workfront.com/blog/project-management-101-the-5-ws-and-1-h-that-should-be-asked-of-every-project







Boost Climate Resilience









Home Ab

Newsroom

Governor Newsom Launches Innovative Strategies to Use California Land to Fight Climate Change, Conserve Biodiversity and

Published: Oct 07, 2020

"The state's natural and working lands sustain our economy, support our unique biodiversity and contribute to the global food supply."

"California ralia and 100 million as a flower of land."

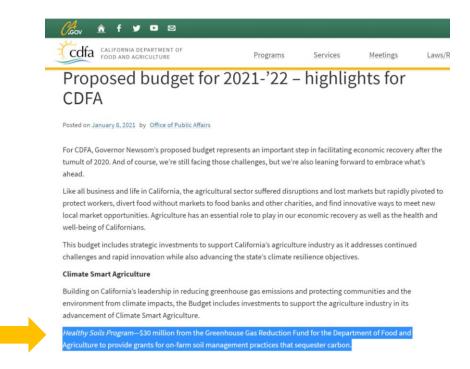
"California relies on 100 million acres of land for food, water and habitat, and feeds the nation and world through its agricultural activities."

"The \$50 billion California agriculture industry produces over 400 commodities, including over a third of the nation's vegetables and two-thirds of the nation's fruits and nuts."



EXECUTIVE ORDER N-82-20

- 2. To support the global effort to combat the biodiversity and climate crises, it is the goal of the State to conserve at least 30 percent of California's land and coastal waters by 2030. The California Natural Resources Agency and other relevant state agencies, in consultation with the Collaborative, are directed to develop and report strategies to the Governor no later than February 1, 2022 to achieve this goal in a manner that:
 - Safeguards our State's economic sustainability and food security.
- 4. To advance efforts to conserve biodiversity, the California Department of Food and Agriculture is directed to take the following actions with existing authority and resources:
 - a. Coordinate with other relevant state agencies and private partners to reinvigorate populations of pollinator insects across the State, which restore biodiversity and improve agricultural production.
 - b. Implement strategic efforts to protect California's native plants and animals from invasive species and pests that threaten biodiversity and economic activities.
 - c. Enhance soil health and biodiversity through the Healthy Soils Initiative.





EXECUTIVE ORDER N-82-20



 The California Department of Food and Agriculture shall work with agricultural stakeholders to identify farmer- and rancher-led solutions to inform the next Scoping Plan process.





















Publications

THE OFFICE OF environmental farming & innovation

CDFA Home OEFI Top Climate-related Highlights for CDFA

Top Climate-related Highlights for CDFA

News Release

CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

Media Contacts: Steve Lyle (CDFA), 916-654-0462, officeofpublicaffairs@cdfa.ca.gov

CDFA ANNOUNCES STAKEHOLDER ENGAGEMENT OPPORTUNITIES ON FARMER-AND RANCHER-LED CLIMATE-CHANGE SOLUTIONS



SACRAMENTO, January 28, 2021 - The California Department of Food and Agriculture (CDFA), per the Governors Executive Order N-82-20, will be holding stakeholder meetings in February to solicit feedback from the public and agricultural stakeholders on farmer-and rancher-led climate solutions that sequester carbon, reduce greenhouse gases and enhance biodiversity.

These outreach meetings are essential to ensure we gain information and knowledge from the people who" live and work on the land and the organizations that support them," said CDFA Secretary Karen Ross. "We want to hear from all those interested in discussing farmer- and rancher-led efforts to help ensure climate resilience, greenhouse gas mitigation, biodiversity and food security.'

The meetings will be organized around three agricultural categories: livestock and dairy; row and field crops (annual crops); and trees and vines (perennial crops). The resulting report will be made available for a 30day Public Comment period, after which the information will be used to inform CDFA and other state agencies about farmer-and rancher-led climate solutions. The collected information will also inform the next update of the California AB 32 and SB 32 Scoping Plan, and ongoing and future work of the Natural Working Lands Climate Smart strategy.

Engagement Opportunities On Farmer- And Rancher-Led Climate-Change Solutions

The CDFA will hold stakeholder meetings in February to solicit feedback from the public and agricultural stakeholders on climate-change solutions that sequester carbon, reduce greenhouse gases and enhance biodiversity.

The meetings will be organized around three agricultural categories: livestock and dairy; row and field crops (annual crops); and trees and vines (perennial crops). For each agricultural category CDFA will host two meetings of approximately two hours each. The first meeting will include an introductory presentation followed by an opportunity for stakeholder input. The second meeting will allow further discussion and capture additional feedback. Those interested in attending are invited to register via the following links:

- Livestock and Dairy Meeting #1, February 8 at 2 p.m.: https://csus.zoom.us/meeting/register/tZYsdOgrjwpE9TCt74IRi0V4FaVYS9f5jNu
 - Livestock and Dairy Meeting #2, February 12 at 9 a.m.: https://csus.zoom.us/meeting/register/tZEpceopzMsGNAruyE0r0-kytqobtBN_cNN
- Annual Crops Meeting #1, February 16 at 2 p.m.: https://csus.zoom.us/meeting/register/tZYtdOqgqj0sGNRlzD5RdDouZcGBWa3d_RMc









Next



























CDFA Home OEFI Climate Change Consortium for Specialty Crops

Climate Change Consortium for Specialty Crops

Climate Change Consortium - Statewide Effort (2012-2013)

In the summer of 2012 CDFA announced the formation of the Climate Change Consortium for Specialty Crops to identify solutions for climate change impacts to California's valuable specialty crop industry. The Consortium was comprised of 21 people including growers from the top ten specialty crops; agricultural association representatives and stakeholders; researchers from the University of California and California State University systems; an agricultural commissioner; a certified crop advisor/ pest control advisor; and a member of the California Association of Resource Conservation Districts. The Consortium members met for four two-day meetings over the course of six months. At each meeting the Consortium heard from various researchers working on the interface of agriculture and climate change. The Consortium was asked to assume that climate change is occurring and to make recommendations to CDFA drawing on their own backgrounds and expertise. The final report summarizes the potential impacts of climate change to California's specialty crop industry and outlines the recommendations of the Consortium.

- Final Report Climate Change Consortium for Specialty Crops: Impacts and Strategies for Resilience 🖹
- ▶ Outreach Presentation on the Impacts of Climate Change on California's Specialty Crops 🖹
- ▶ Acknowledgements 🖟
- ▶ Summary of Recommendations 🖹
- ▶ Summary of CDFA's Response to the Climate Change Consortium's Recommendations 🖹 October 2016



California Department of Food and Agriculture



CDFA Incentive Programs

Climate Change Scoping Plan

https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scopingplan

The 2017 Scoping Plan identifies how the State can reach our 2030 climate target to reduce greenhouse gas emissions by 40 percent from 1990 levels, and substantially advance toward our 2050 climate goal to reduce greenhouse gas emissions by 80 percent below 1990 levels.



Climate Change Research Plan (4th Climate Assessment Research)

https://www.climateassessment.ca.gov/about/

California's Fourth Climate
Change Assessment (Fourth
Assessment) advances
actionable science that serves
the growing needs of state and
local-level decision-makers from a
variety of sectors.

State Adaptation Strategy

https://www.slc.ca.gov/sea-level-rise/safeguarding-california-plan-2018-update/

The 2018 Update to the Safeguarding California Plan is a roadmap showing how California's state government is taking action to respond to climate change.

Recommendation	Key Partners	Level of Priority	Timeframe	Potential Cost to CDFA
 Improve Growers' Ability to Adapt to Climate Change CDFA should support USDA Natural Resources Conservation Service in a review and/or creation of policies to improve growers' ability to adapt to climate change. These policies should: Promote new technologies for climate change relevant to water, soil, and pest management; Incentivize grower adoption of technologies and practices for improved water management, which includes use of: water meters, soil moisture sensors, on-farm water storage, and groundwater recharge where possible; Suggest ways to scale best management practices (BMPs) to all sizes of farms. 	 USDA Natural Resources Conservation Service (NRCS) Ag Associations & Commodity Groups Growers Resource Conservation Districts UC ANR Cooperative Extension Irrigation districts California Department of Water Resources (DWR) 	Secondary	Medium	Low

Used feedback to inform;

- AB 32 Scoping Plan update (Climate change mitigation focused)
- Safeguarding California Report (Climate change adaptation focused)
 - 4th Assessment for Climate Change (Research)
- Budget change proposals
 - Development of incentive programs using California Climate Investment Funds (Greenhouse gas reduction fund)

Recommendation	Key Partners	Level of Priority	Timeframe	Potential Cost to CDFA
 Improve Growers' Ability to Adapt to Climate Change CDFA should support USDA Natural Resources Conservation Service in a review and/or creation of policies to improve growers' ability to adapt to climate change. These policies should: Promote new technologies for climate change relevant to water, soil, and pest management; Incentivize grower adoption of technologies and practices for improved water management, which includes use of: water meters, soil moisture sensors, on-farm water storage, and groundwater recharge where possible; Suggest ways to scale best management practices (BMPs) to all sizes of farms. 		Secondary	Medium	Low

SWEEP;

- Promotes new technologies
- Incentivizes grower adoption of technologies and practices for improved water management
- Scales conservation management practices to all sizes of farms



SWEEP provides financial assistance in the form of grants to implement irrigation systems that reduce greenhouse gases and save water on California agricultural operations

Total awarded = \$87.5 million Number of projects funded = 828 Total number of acres covered = 134,000 Total match to date = \$50.1 million Total GHG reductions = 80,000 MTCO2e/year

Total Water Reductions = 115,000 Acre feet/year Projects are CDFA verified 3-year reporting on GHG and water savings post project implementation









First Climate Smart Agriculture incentive program set up by CDFA (2014)

SB 1383 (Lara, 2016):
Begin implementing Short
Lived Climate Pollutant (SLCP)
emission reduction strategy
developed in response to
SB605 by January 1, 2018

CARB to consult with CDFA on rule making

Convene Dairy and Livestock Working Group

• 3 subgroups were convened (Digester, Non-digester and research needs and enteric)

A total of 28 meetings (Open to public)

 Last public meeting, workgroup presented recommendations to State Agency Heads



Workgroup Recommendations

SG#1: Fostering markets for Non Digester Projects

- Continue funding via CDFA's Alternative Manure Management Program (AMMP) and continue improving AMMP
- Develop Non Digester R&D Program and Outreach and Education program

SG#2: Fostering markets for Digester Projects

- Continue \$ 100 million annual allocation
- CDFA should allow new renewal pathways for Dairy Digester Research and Development Program (DDRDP)

SG#3: Research needs including Enteric fermentation

- Refine inventory with California specific data
- Develop new and standardized measurement methods





Financial assistance for the installation of dairy digesters in California to reduce methane greenhouse gas emissions



https://www.cdfa.ca.gov/oefi/ddrdp/

\$2-3 million grants – must have matching funds of 50%

Total awarded = \$195.7 million

Matching funds = \$413.1 million

119 number of projects funded

Total GHG reductions annually = ~2.1 million MTCO2e

Oversubscription rate = 150-400%

Gas used for both renewable electricity and renewable natural gas

Multiple benefits – odor reduction, water quality



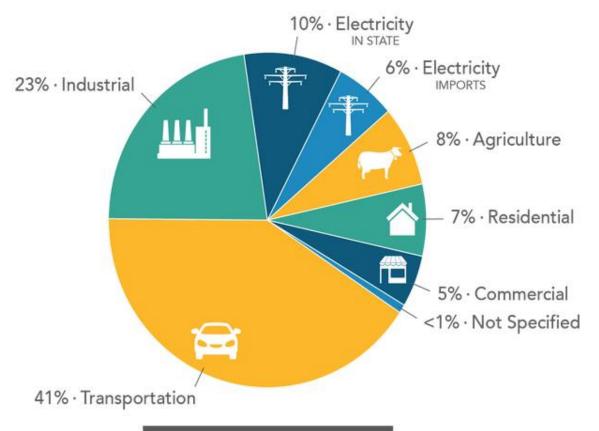


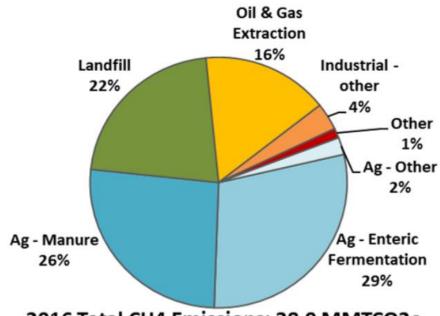
117 projects funded
Total GHG reductions annually = ~233,500 MTCO2e
\$750,000 grants – matching funds not required
Total awarded = \$69. million
Matching funds = \$10 million
Oversubscription rate = 175-600%

AMMP provides financial assistance for the implementation of non-digester manure management practices in California to reduce methane greenhouse gases

DDRDP and AMMP work to achieve 2030 and 2050 GHG reduction goals set by Governor(s)

80% reduction below 1990 levels by 2050 (2006) 40% reduction below 1990 levels by 2030 (2015)





2016 Total CH4 Emissions: 38.9 MMTCO2e

429.4 MMTCO₂e 2016 TOTAL CA EMISSIONS

Incentive programs allow growers to try one or more of 27 management practices that they may have or have not done before or implemented in parts of their agricultural operation to sequester carbon

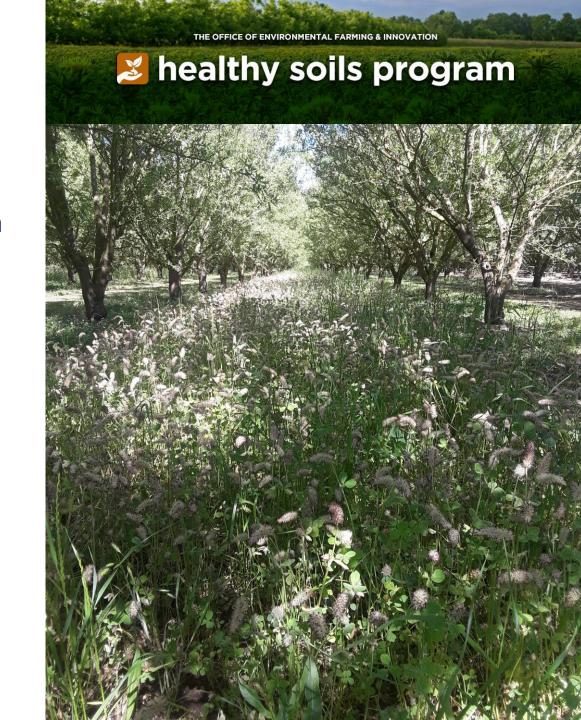
https://www.cdfa.ca.gov/oefi/healthysoils/IncentivesProgram.html

First in nation to tie soil management practices with GHG reductions in soils (Comet-Planner)

Contributes to climate change adaptation, GHG mitigation and agricultural sustainability

Also funds Demonstration Projects to further advance HSP adoption

https://www.cdfa.ca.gov/oefi/healthysoils/DemonstrationProjects.html







\$48 million total to date
580 Incentive Projects (\$100,000 cap)
66 Demonstration Projects (\$100,000 to \$250,000 cap)
54,000 acres from Incentive Projects
~105,900 MTCO2e/year reduction from Incentive Projects
Uses GGRF (revenues from Cap-and-Trade Program) and Bond funding
Quantified using COMET-Planner tool

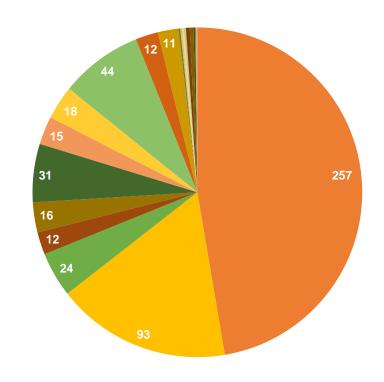




2020 HEALTHY SOILS PROGRAM (HSP) INCENTIVES PROGRAM – PROJECTS SELECTED FOR AWARDS

Most Frequently Requested Practices by Number of Projects (Total ~319 projects)

Note: Majority of projects proposed multiple practices.



- **■** Compost Application
- **■** Nutrient Management
- **Whole Orchard Recycling**
- Windbreak/Shelterbelt Establishment
- Silvopasture
- **■** Forage and Biomass Planting
- Prescribed Grazing

- Cover Crop
- **■** Conservation Cover
- Reduced Till
- Range Planting
- Riparian Forest Buffer
- Tree Shrub Establishment

- No-Till
- **■** Hedgerow Planting
- Mulching
- Multi-story Cropping
- Riparian Herbaceous Buffer
- Grassed Waterway



Technical assistance in the form of hands-on application assistance to farmers and ranchers is critical to the success of CDFA's Climate Smart Agriculture programs.

State investment to further advance adoption of climate smart practices.

	AMMP	HSP	Total
Individuals Assisted	41	1,125	1,166
Applications Submitted	23	324	347
SDFR Individuals Assisted	11	166	177
Farming < 500 Acres Assisted	20	723	743
Non-English Speakers	0	107	107
Provided Computer Access	12	68	80
Priority Population Individuals	13	235	248

- 33 Organizations
- Assistance provided in English, Spanish, Chinese, Hmong, Portuguese
- Total Invoiced: \$728,592
- Total Awarded: \$2,139,360 for 3 years





EXECUTIVE ORDER N-82-20



 The California Department of Food and Agriculture shall work with agricultural stakeholders to identify farmer- and rancher-led solutions to inform the next Scoping Plan process.



Discussion should also include food processors, renewable energy and engine replacement and understanding biggest barriers to wider adoption of climate solutions (e.g., risk; economic benefits, shortage of labor, technical assistance)



. What additional management practices can farmers and ranchers use as climate change solutions?

What technology solutions could we explore as farmerand rancher-led solutions?

AGRICULTURAL MANAGEMENT PRACTICES INCENTIVIZED THROUGH THE CDFA DAIRY AND LIVESTOCK METHANE REDUCTION INCENTIVES PROGRAMS

CDFA has identified eligible manure management practices that reduce atmospheric greenhouse gases (GHGs) and provide additional benefits, such as renewable energy and compost production, for funding through its two dairy methane reduction incentives programs. Program specific Quantification Methodologies and tools to estimate GHG reduction and co-benefits developed in collaboration with the California Air Resources Board (CARB) are currently available for these practices.

I. Alternative Manure Management Program

Manure Collection and/or Separation:

- 1. Pasture-based management
 - a. Alternative manure treatment and storage such as compost bedded pack barn and slatted floor pit storage manure collection
- 2. Solid separation of manure solids prior to entry into a wet/anaerobic environment through technologies such as:
 - a. Weeping Wall (system must have a minimum of at least two cells)
 - b. Stationary Screen
 - c. Vibrating Screen
 - d. Screw Press
 - e. Centrifuae
 - f. Roller Drum
 - g. Belt Press/Screen
- 3. Conversion from a flush to scrape

Each manure collection and/or storage practice must be followed by manure treatment, trying and/or storage from the options below:

- 1. Open solar drying of manure
- 2. Closed solar drying
- 3. Forced evaporation with natural-gas fueled dryers;
- 4. Daily spread
- 5. Solid Storage
- 6. Composting in vessel
- 7. Composting in aerated static pile
- 8. Composting in intensive windrows
- 9. Composting in passive windrows

II. Dairy Digester Research and Development Program

Anaerobic digester systems on California dairy operations that convert the bio-methane to renewable electricity or fuel (to use on-site or inject into an existing pipeline), or for the utilization of energy at a neighboring facility or transportation fuel.

AGRICULTURAL MANAGEMENT PRACTICES ELIGIBLE FOR FUNDING THROUGH THE CDFA HEALTHY SOILS PROGRAM (HSP)

CDFA has identified eligible agricultural management practices that sequester carbon, reduce atmospheric GHGs, and improve soil health, for funding through the HSP Incentives Program and HSP Demonstration Projects. These practices were selected from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Conservation Practice Standards (CPS) and CDFA specified practices such as compost application and whole orchard recycling. HSP-specific Quantification Methodology and tools to estimate GHG reduction and co-benefits developed in collaboration with the California Air Resources Board (CARB) and USDA NRCS are currently available for these practices.

Eligible practices are categorized based on agricultural systems where they can be implemented. They are divided into three categories below.

I. Cropland

- Alley Cropping (USDA NRCS CPS 311)
- Compost Application
 - Compost Purchased from a Certified Facility
 - o On-farm Produced Compost
- Conservation Cover (<u>USDA NRCS CPS 327</u>)
- Conservation Crop Rotation (<u>USDA NRCS CPS 328</u>)
- Contour Buffer Strips (USDA NRCS CPS 332)
- Cover Crop (USDA NRCS CPS 340)
- Field Border (<u>USDA NRCS CPS 386</u>)
- Filter Strip (<u>USDA NRCS CPS 393</u>)
- Forage and Biomass Planting (<u>USDA NRCS 512</u>)
- Grassed Waterway (<u>USDA NRCS CPS 412</u>)
- Hedgerow Planting (USDA NRCS CPS 422)
- Herbaceous Wind Barrier (USDA NRCS CPS 603)
- Mulching (<u>USDA NRCS CPS 484</u>)
- Multi-story Cropping (<u>USDA NRCS CPS 379</u>)
- Nutrient Management (<u>USDA NRCS CPS 590</u>) (15% reduction in fertilizer application *only*)

- Residue and Tillage Management No-Till (USDA NRCS CPS 329)
- Residue and Tillage Management Reduced Till (USDA NRCS CPS 345)
- Riparian Forest Buffer (USDA NRCS CPS 391)
- Riparian Herbaceous Cover (USDA NRCS CPS 390)
- Strip Cropping (<u>USDA NRCS CPS 585</u>)
- Tree/Shrub Establishment (USDA NRCS CPS 612)
- Vegetative Barriers (601) (USDA NRCS CPS 601)
- Windbreak/Shelterbelt Establishment (USDA NRCS CPS 380)

II. Orchard or Vineyard

- Compost Application
 - Compost Purchased from a Certified Facility
 - On-farm Produced Compost
- Conservation Cover (<u>USDA NRCS CPS 327</u>)
- Cover Crop (USDA NRCS CPS 340)
- Filter Strip (<u>USDA NRCS CPS 393</u>)
- Mulching (USDA NRCS CPS 484)
- Hedgerow Planting (USDA NRCS CPS 422)
- Nutrient Management (<u>USDA NRCS CPS 590</u>) (15% reduction in fertilizer application *only*)
- Residue and Tillage Management No-Till (USDA NRCS CPS 329)
- Residue and Tillage Management Reduced Till (USDA NRCS CPS 345)
- Whole Orchard Recycling
- Windbreak/Shelterbelt Establishment (USDA NRCS CPS 380)

III. Grazing Land

- Compost Application
 - Compost Purchased from a Certified Facility
 - On-farm Produced Compost
- Hedgerow Planting (USDA NRCS CPS 422)
- Prescribed Grazing (<u>USDA NRCS CPS 528</u>)
- Range Planting (<u>USDA NRCS CPS 550</u>)
- Riparian Forest Buffer (USDA NRCS CPS 391)
- Silvopasture (USDA NRCS CPS 381)
- Tree/Shrub Establishment (USDA NRCS CPS 612)
- Windbreak/Shelterbelt Establishment (USDA NRCS CPS 380)

Additional Practices for Demonstration and Data Collection

In addition to the above listed practices, additional practices are eligible for funding through the HSP Demonstration Projects (Type A projects). A GHG quantification methodology is not currently available for these practices, therefore, field GHG measurements must be included as part of the proposed projects. Projects proposing these practices are required to collect scientific data to fulfill the following priorities and to inform development of implementation standards for these practices in the long-term:

- (i) Demonstrate soil organic carbon sequestration and GHG reduction potential of the practice in diverse California climate types, soil types and crop types, through collection of data including but not limited to field measurement of GHG emissions and soil health indicators.
- (ii) Address knowledge gaps regarding environmental and eco-system impacts and co-benefits resulting from implementation of these practices at field-scale.
- (iii) Develop and/or standardize methodology for practice implementation, and, formulation and characterization of material(s) needed for implementation of practices including but not limited to vermicompost and microbial inoculation with compost tea.

The practices eligible under this category are:

- Anaerobic Digestate Application: Cropland application of solids generated from anaerobic digestion of organic materials.
- Microbial Inoculation with Compost Tea: Cropland application of diluted compost steeped or brewed in water with aeration/stirring (i.e. compost tea).
- Mycorrhizal Application: Incorporating soil with fungi that form a symbiotic relationship with roots of crop plants.
- Nutrient Management (<u>CPS 590</u>) (Replacing Synthetic N Fertilizer with Soil Amendments such as beef feedlot manure, chicken broiler manure, chicken layer manure, other manure, dairy manure, sheep manure and swine manure).
- Nutrient Management (<u>CPS 590</u>) (Use of Nitrification Inhibitors).
- Nutrient Management (<u>CPS 590</u>) (Use of Slow Release Fertilizers).
- One-Time Compost Application with Higher Rates for Grazed Grasslands: Application of compost to grazed grasslands at rates higher than currently supported by Healthy Soils Program once every ten years.
- Vermicompost Application: Application of compost produced from organic materials using various species of worms.

AGRICULTURAL MANAGEMENT PRACTICES ELIGIBLE FOR FUNDING THROUGH THE CDFA STATE WATER EFFICIENCY AND ENHANCEMENT PROGRAM (SWEEP)

CDFA has identified eligible agricultural management practices that support water conservation, improved water efficiency, improved energy efficiency and/or reduction of greenhouse gas (GHG) emissions from agricultural water distribution systems on farms. These practices were selected from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Conservation Practice Standards (CPS). These practices, used in various combinations, can support SWEEP's objectives of on-farm water savings and GHG emissions reductions from crop irrigation. SWEEP specific Quantification Methodology and tools to estimate GHG reduction, water savings and co-benefits developed in collaboration with the California Air Resources Board (CARB) and USDA NRCS are currently available for these practices. SWEEP also funds project components that, when used in combination with these management practices, contribute to water conservation, water and energy efficiency improvements and GHG reductions.

- Combustion System Improvement (USDA NRCS CPS <u>372</u>)
- Irrigation Ditch Lining (USDA NRCS CPS 428)
- Irrigation Pipeline (USDA NRCS CPS <u>430</u>)
- Irrigation Reservoir (USDA NRCS CPS <u>436</u>)
- Irrigation System, Microirrigation (USDA NRCS CPS <u>441</u>)
- Sprinkler System (USDA NRCS CPS <u>442</u>)
- Irrigation Water Management (USDA NRCS CPS <u>449</u>)
- Irrigation Land Leveling (USDA NRCS CPS <u>464</u>)
- Pumping Plant (USDA NRCS CPS <u>553</u>)
- Structure for Water Control (USDA NRCS CPS <u>587</u>)
- Salinity and Sodic Soil Management (USDA NRCS CPS 610)
- Water Harvesting Catchment (USDA NRCS CPS 636)