

HEALTHY SOILS - DEMONSTRATION PROGRAM

Request for Grant Applications

Release date: June 29, 2023 Application due by: 5:00 p.m. PT on August 28, 2023 Late submissions will not be accepted.



Office of Environmental Farming and Innovation California Department of Food and Agriculture 1220 N Street, Sacramento, CA 95814

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About the Program

Background and Purpose

The California Department of Food and Agriculture (CDFA) is pleased to announce funding availability through a competitive grant process for the Healthy Soils (HS) Demonstration Program.

The HS Demonstration Program, a part of Healthy Soils Program (HSP), stems from the California Healthy Soils Initiative, a collaboration of state agencies and departments that promotes the development of healthy soils on California's farmlands and ranchlands.

The objectives of the HSP are to increase statewide implementation of conservation management practices that improve soil health, sequester carbon and reduce atmospheric greenhouse gases (GHGs) by (1) providing financial incentives to California farmers and ranchers for agricultural management practices that sequester carbon, reduce atmospheric GHGs and improve soil health, (2) funding on-farm demonstration projects that collect data and/or showcase conservation management practices that mitigate GHG emissions and improve soil health, and (3) creating a platform promoting widespread adoption of conservation management practices throughout the state. The HS Demonstration Program addresses Objectives 2 and 3. Objective 1 is addressed in the Healthy Soils Incentives Program.

Funding and Duration

CDFA was appropriated \$70 million from the California State Budget, authorized by the Budget Act of 2022 (SB 154). CDFA will make available approximately \$4 million for the HS Demonstration Program.

- Demonstration Program grant amounts cannot exceed
 - \$300,000 for a Type A project, and
 - \circ \$150,000 for a Type B project.
- The maximum grant duration is three years and grant funds cannot be expended before the grant agreement is executed and/or the grant start date, whichever is later, or after the grant agreement term has ended.
- CDFA reserves the right to offer an award different than the amount requested.
- Cost sharing (matching funds or in-kind contributions) during grant duration is not required but encouraged.

Eligibility and Exclusions

The HS Demonstration Program will fund projects that implement eligible agricultural management practices and conduct outreach to California farmers and ranchers at on-farm demonstration sites. Projects must showcase conservation management practices that mitigate GHG emissions and increase soil health and help create a platform promoting widespread adoption of conservation management practices throughout the state.

Eligibility

- Nonprofit entities, University Cooperative Extensions, Federal and University Experiment Stations, city and community colleges, Resource Conservation Districts (RCDs), California Native American Tribes, and farmers and ranchers in partnership with one of the aforementioned entities are eligible to apply.
- Individuals are not eligible to apply.
- As part of nonprofit entities, use of grant funds for service members through established service programs including AmeriCorps, California Conservation Corps, or a certified local community conservation corps to support the implementation of applicable projects is eligible.
- A project must include at least one farm (private agricultural operation, university/government owned farm or city community garden) to fulfill demonstration requirements. For the purposes of this program, an agricultural operation is defined as row, vineyard, field and tree crops, commercial nurseries, nursery stock production, and greenhouse operations producing food crops or flowers as defined in Food and <u>Agricultural Code section 77911</u>.
- More than one farm may be included in a single application; however, the same farm cannot be included in multiple applications.
- CDFA will award a maximum of two applications submitted by the same lead applicant, but each application should be for a unique project.
- Entities receiving grant funds must be located in California with a physical California business address.
- Applicants must lease, own, or otherwise control the fields and Assessor's Parcel Number (APN) where project activities are proposed to occur for the entirety of the project duration. If leasing land, applicants must provide landowner's agreement to implement proposed practices(s) for the entire grant term. If duration of lease is shorter than project duration, landowner and lessee must provide a signed statement that lease renewal will be negotiated in good faith.

 If selected for an award, applicants must be able to respond to information required by CDFA to execute a grant agreement within 30 days of receiving a notice of award. CDFA reserves the right to rescind award offer if awardee fails to respond within 30 days.

Exclusions

- Program funds cannot be used to implement management practices that are not listed under <u>Eligible Agricultural Management Practices</u> in this grant solicitation. All requirements for practice implementation must be followed wherever applicable.
- Program funds cannot be used to fund fields with existing and ongoing implementation of any agricultural management practices listed under <u>Eligible Agricultural Management Practices</u>, including fields for which a HS Demonstration, Block Grant on-farm project, or Incentives project was previously awarded.
 - A practice implemented on same field or APN in the previous year is not eligible for funding.
 - A previously implemented practice can be implemented on a new, different field within the same APN.
 - Practices cannot be moved to different fields within an APN during the term of the grant agreement.
- Awards made through the HS Demonstrations Program cannot be used as cost share for any other awards made through the HS Demonstration Program, the HS Incentives Program, or HS Block Grant Pilot Program.
- Compost Application and Whole Orchard Recycling Practices must not be implemented on APNs consisting of soils with soil organic matter content greater than 20 percent by dry weight (in top 20 cm or 8-inch depth).
- Practices may not be implemented on lands or crop types that are not suitable based on <u>USDA - NRCS (USDA Natural Resources Conservation</u> <u>Service) Conservation Practice Standards</u> and <u>USDA - NRCS California</u> <u>Scenarios</u>.
- Program funds cannot be used for projects that use potted plants or other plant growth media.
- Program funds cannot be used for projects on cannabis cultivation operations.
- Program funds cannot be used for research on product development and/or evaluation.

Executive Order N-6-22 – Russia Sanctions

On March 4, 2022, Governor Gavin Newsom issued Executive Order (EO) N-6-22 regarding Economic Sanctions against Russia and Russian entities and individuals. "Economic Sanctions" refers to sanctions imposed by the U.S. government in response to Russia's actions in Ukraine, as well as any sanctions imposed under state law. By submitting a bid, proposal, or application, Bidder/Applicant represents that it is not a target of Economic Sanctions. Should the State determine Bidder/Applicant is a target of Economic Sanctions or is conducting prohibited transactions with sanctioned individuals or entities, that shall be grounds for rejection of the Bidder's/Applicant's bid /proposal /application any time prior to contract/agreement execution, or, if determined after contract/agreement execution, shall be grounds for termination by the State.

Project Types

CDFA has identified two types of Demonstration Projects to facilitate a diversity of applications and promote widespread adoption of the eligible agricultural management practices. The eligible project types are:

- (i) Type A: Projects are required to (a) implement the selected eligible agricultural management practice(s), (b) collect data on field measurements of GHG emissions and crop yield, (c) collect co-benefit data including soil organic matter content and soil water parameters, (d) collect other co-benefit data including benefits to soil health and environmental water and air quality data to address knowledge gaps regarding implementation of practices identified as "Practices for Demonstration and Data Collection" (See Eligible Agricultural Management Practices), and (d) conduct outreach and education to other farmers and ranchers on the benefits of these practices to agricultural and environmental sustainability. The maximum grant award for a Type A project is \$300,000.
- (ii) Type B: Projects are required to (a) implement the selected eligible agricultural management practice(s), (b) collect co-benefit data including soil organic matter content and soil water parameters, and (c) conduct outreach and education to other farmers and ranchers at the on-farm demonstration sites on the benefits of these practices to agricultural and environmental sustainability. The maximum grant award for a Type B project is \$150,000.

Eligible Agricultural Management Practices

CDFA has identified eligible agricultural management practices that sequester carbon, reduce atmospheric GHGs, and improve soil health for the HS -Demonstration Program. Applicants must implement one or more of the following management practices on APN(s) where selected practices have not been implemented in the previous year (See <u>Eligibility</u>). An applicant must include the APN(s) of the field(s) where the eligible management practice(s) will be implemented. Applicants may include multiple practices on the same APN or the same practice on multiple APNs. Some practices may not be implemented on the exact same field as part of the same project. Refer to <u>Non-Overlapping Practices</u> for details.

Eligible Practices for Type A Projects

CDFA has identified several specified practices for which a California Air Resources Board (CARB)-approved GHG quantification methodology is not currently available. Field GHG emission measurements must be included as part of the proposed projects. Projects proposing these practices are required to develop scientifically sound experimental design to fulfill the following priorities and to inform development of implementation standards for selected practices in the long-term:

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

The practices eligible under this category are:

I. Cropland, Orchard and/or Vineyard

1. Anaerobic Digestate Application: Cropland application of solids generated from anaerobic digestion of organic materials.

- 2. Microbial Inoculation with Compost Tea: Cropland application of diluted compost steeped or brewed in water with aeration/stirring (i.e., compost tea).
- 3. Mycorrhizal Application: Incorporating soil with fungi that form a symbiotic relationship with roots of crop plants.
- 4. Nutrient Management 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.
- 5. Nutrient Management Use of Nitrification Inhibitors.
- 6. Nutrient Management Use of Slow-Release Fertilizers.
- 7. Vermicompost Application: Application of compost produced from organic materials using various species of worms.
- 8. Biochar Application: Application of biochar produced from organic materials to soil.
- 9. Food Waste Hydrolysate Application: Application of hydrolysate product produced from food waste treatment to soil.
- 10. Re-saturating Delta peat soils through rice cultivation (Cropland only).

II. Grazing Land

 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.

HS Demonstration Program will not support the development and/or evaluation of proprietary products. Information and data generated as a result of this funding opportunity must be made available publicly. Publication in peerreviewed and open-access scientific journals is strongly encouraged.

Eligible Practices for Type B Projects

The following management practices were selected from the <u>USDA - NRCS</u> <u>Conservation Practice Standards</u>, and CDFA specified Compost Application and Whole Orchard Recycling (WOR) Practices. CDFA HSP-specific GHG Quantification Methodology is currently available for these practices.

All practices must be implemented in accordance with their respective NRCS CPS requirements for implementation in California, <u>CDFA Compost Application</u> <u>White Paper</u> and CDFA's <u>Whole Orchard Recycling Report</u>. HSP-specific requirements for implementation of eligible practices are based on NRCS CPS documentation and <u>USDA - NRCS California Scenarios</u> (HSP-specific practices only). Refer to the Program Requirements and <u>Appendix A</u> for details.

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

I. Cropland

- 1. Alley Cropping (USDA NRCS CPS 311)
- 2. Compost Application (USDA NRCS CPS 808)
 - a. Compost Purchased from a Certified Facility
 - b. On-farm Produced Compost
- 3. Conservation Cover (USDA NRCS CPS 327)
- 4. Conservation Crop Rotation (USDA NRCS CPS 328)
- 5. Contour Buffer Strips (USDA NRCS CPS 332)
- 6. Cover Crop (USDA NRCS CPS 340)
- 7. Field Border (USDA NRCS CPS 386)
- 8. Filter Strip (USDA NRCS CPS 393)
- 9. Forage and Biomass Planting/Pasture and Hay Planting (USDA NRCS 512)
- 10. Grassed Waterway (USDA NRCS CPS 412)
- 11. Hedgerow Planting (USDA NRCS CPS 422)
- 12. Herbaceous Wind Barrier (USDA NRCS CPS 603)
- 13. Mulching
 - a. Natural Materials (USDA NRCS CPS 484)
 - b. Wood Chips (USDA NRCS CPS 484)
- 14. Multi-story Cropping /Forest Farming (USDA NRCS CPS 379)
- 15. Nutrient Management (USDA NRCS CPS 590) (15% reduction in fertilizer application *only*)
- 16. Residue and Tillage Management No-Till (USDA NRCS CPS 329)
- 17. Residue and Tillage Management Reduced Till (USDA NRCS CPS 345)
- 18. Riparian Forest Buffer (USDA NRCS CPS 391)
- 19. Riparian Herbaceous Cover (USDA NRCS CPS 390)
- 20. Strip Cropping (USDA NRCS CPS 585)
- 21. Tree/Shrub Establishment (USDA NRCS CPS 612)
- 22. Vegetative Barriers (601) (USDA NRCS CPS 601)
- 23. Windbreak/Shelterbelt Establishment (USDA NRCS CPS 380)

II. Orchard or Vineyard

- 1. Compost Application (USDA NRCS CPS 808)
 - a. Compost Purchased from a Certified Facility
 - b. On-farm Produced Compost

- 2. Conservation Cover (USDA NRCS CPS 327)
- 3. Cover Crop (USDA NRCS CPS 340)
- 4. Filter Strip (USDA NRCS CPS 393)
- 5. Hedgerow Planting (USDA NRCS CPS 422)
- 6. Mulching
 - a. Natural Materials (USDA NRCS CPS 484)
 - b. Wood Chips (USDA NRCS CPS 484)
- 7. Nutrient Management (USDA NRCS CPS 590) (15% reduction in fertilizer application only)
- 8. Residue and Tillage Management No-Till (USDA NRCS CPS 329)
- 9. Residue and Tillage Management Reduced Till (USDA NRCS CPS 345)
- 10. Whole Orchard Recycling (Interim CPS 808)
- 11. Windbreak/Shelterbelt Establishment (USDA NRCS CPS 380)

III. Grazing Land

- 1. Compost Application (USDA NRCS CPS 808)
 - a. Compost Purchased from a Certified Facility
 - b. On-farm Produced Compost
- 2. Hedgerow Planting (USDA NRCS CPS 422)
- 3. Prescribed Grazing (USDA NRCS CPS 528)
- 4. Range Planting (USDA NRCS CPS 550)
- 5. Riparian Forest Buffer (USDA NRCS CPS 391)
- 6. Silvopasture (USDA NRCS CPS 381)
- 7. Tree/Shrub Establishment (USDA NRCS CPS 612)
- 8. Windbreak/Shelterbelt Establishment (USDA NRCS CPS 380)

Technical Specifications for Estimation of GHG Benefits

Expected Life of Practices: To estimate the net GHG benefits due to a practice implementation, the expected life of the practice is as follows:

Eligible Agricultural Management Practice	Expected Life of Practice*
Practices that involve planting of woody cover (trees/shrubs)	10 Years
All other practices	3 Years

*Expected Life of Practice for the HSP is different from that required by USDA-NRCS, and distinct from the grant duration. In addition to the NRCS CPS requirements, <u>USDA - NRCS California Scenarios</u> and the table provided above, the following scientific documents were used to establish requirements for implementation of practices:

- 1. COMET-Planner Report: This report explains the scientific approaches that the quantification methodology has been utilized to estimate greenhouse gas reduction benefits for the CDFA HSP and is available at: <u>http://bfuels.nrel.colostate.edu/health/COMET-Planner_Report_Final.pdf</u>
- 2. White paper titled 'Compost Application Rates for California Croplands and Rangelands for a CDFA Healthy Soils Incentives Program', available at: <u>https://www.cdfa.ca.gov/oefi/healthysoils/docs/CompostApplicationRat</u> <u>e WhitePaper.pdf.</u>
- California Air Resources Board (CARB) Healthy Soils Quantification Methodology (QM) available at: <u>https://ww2.arb.ca.gov/resources/documents/cci-quantification-benefits-and-reporting-materials</u>.
- 4. CDFA's Report on Whole Orchard Recycling: https://www.cdfa.ca.gov/oefi/healthysoils/docs/CDFA_WOR_Report.pdf

Technical information from these documents was evaluated and synthesized to develop <u>Program Requirements and Limitations</u> and Practice Implementation Requirements in <u>Appendix A</u>.

Timeline

The application period begins June 29, 2023. The deadline to submit a grant application is August 28, 2023 at 5:00 pm Pacific Time. No exceptions will be granted for late submissions.

Activity	Date
Invitation to Submit Grant Applications	June 29, 2023
CDFA Grant Application Workshop Webinars	July 11 and 12, 2023
Applications Due	August 28, 2023
Review Period and Award Notification	September – October 2023
Award Process Timeline	See <u>Award Process*</u>

* Timeline subject to change.

Program Requirements

General Requirements

Submitted applications must meet all applicable requirements in this section to be considered for funding.

- Eligible agricultural management practices can be implemented alone or in combinations, except where specified, on one APN or several APNs.
 Specific fields within each APN where agricultural management practice(s) will be implemented should be named by Field or Plot (such as Field 1, Field 2, Field 3, etc.).
 - Each field/plot and corresponding APNs must be outlined clearly on a map.
 - All fields must have the selected agricultural management practices implemented each year for the duration of the project term. If practices under the <u>Practices for Demonstration and Data Collection</u> for Type A Demonstration Projects category are proposed to be implemented for less than 3 years, applicant must provide appropriate justification within the application. Data collection under this category must be conducted for three years.
 - Implementations must begin prior to the end of each project year.
 - Multiple management practices may be included within the same APN (except for <u>Non-Overlapping Practices</u>), and multiple APNs on the same or different farm(s) may be included in the project.
 - Once awarded, recipients may not change the APNs included in the grant agreement through the duration of the project.
- **Prescribed Grazing:** Projects proposing to implement this practice must be located on grazing lands (i.e., rangelands, grazed grasslands, and pasturelands). Applications for prescribed grazing must include a Grazing Management Plan prepared by a professional Certified Rangeland Manager.
- **Riparian Forest Buffer and/or Riparian Herbaceous Cover:** Fields where implementation of these practices is proposed must be adjacent to and upgradient from water courses or water bodies. Please refer to the USDA NRCS CA CPS 390 and 391 for more information.
- **Conservation Crop Rotation:** Projects proposing to implement this practice must provide a detailed plan for crop rotation, listing all cash crops and/or

cover crops to be planted in the correct sequence as part of the Work Plan.

- **Cover Crop:** Projects proposing to implement this practice may not claim post-termination cover crop residue as mulching practice with natural materials to prevent overestimation of GHG reductions achieved.
- Establishment of Permanent Woody Cover: Projects proposing to implement these practices must take into consideration wildlife and pollinator needs when selecting tree or shrub species. Increasing species diversity, including use of native species, and avoiding species with invasive potential should be considered. Cash crop woody species may not be planted exclusively.
- **Compost Application:** Implementation of this practice must meet the requirements below.
 - Compost Application Rates to be demonstrated for funding are provided in the table below. C:N ratio analyses must be from no later than 6 months before compost application.

Сгор Туре	Compost Type	Moist Short Tons/Acre*
Annual Crops	Higher N (C:N ≤ 11)	3 – 5
	Lower N (C:N > 11)	6 – 8
Tree / Perennial	Higher N (C:N ≤ 11)	2 - 4
	Lower N (C:N > 11)	6 – 8
Rangeland	Lower N (C:N > 11)	6 - 8

*Compost application rates eligible for funding through this program were developed under the guidance of the <u>Environmental Farming Act – Science</u> <u>Advisory Panel (EFA-SAP)</u> and are published in a white paper report titled "Compost Application Rates for California Croplands and Rangelands for a CDFA Healthy Soils Incentives Program" (abbreviated as <u>Compost</u> <u>Application White Paper</u>) by CDFA.

- Sources of compost eligible for funding must meet the following requirements.
 - If compost is purchased:
 - a. Compost must be produced by a facility permitted or otherwise authorized by state and local authorities that can demonstrate compliance with all state regulations. The composting facility must comply with the state minimum standards set forth in <u>California Code of Regulations Title 14 (14 CCR) 14 CCR, Division</u>

<u>7, Chapter 3.1, Articles 5, 6, 7, 8, and 9</u>. Grant recipients must ensure that the composting facilities are listed on one of the following websites:

- CalRecycle SWIS/Site Search website with facility's site regulatory status being "Permitted" or "Notification" <u>https://www2.calrecycle.ca.gov/SolidWaste/Site/Search</u>
- CDFA -OIM Certified Facilities (Only Dry Compost Eligible for Type B projects) <u>https://www.cdfa.ca.gov/is/ffldrs/pdfs/RegisteredOrganicInp</u> <u>utMaterial2022.pdf</u>
- STA Certified Compost Participants (California Only) <u>https://www.compostingcouncil.org/page/participants#CA</u>
- b. A report of laboratory analysis on compost C:N ratio is required.
 C:N ratio analyses must be from no later than 6 months before compost application.

If compost is produced on-farm:

- a. Plant and animal materials must be sourced and remain on the farm and composted through the processes outlined below. A composting log must be maintained to document the process.
 - In-vessel or Static Aerated Pile System: Maintain a temperature between 131°F and 170°F for 3 consecutive days.
 - Windrow Composting: Maintain a temperature between 131°F and 170°F for 15 consecutive days. The materials must be turned a minimum of five times.
- b. C:N ratio of the compost to be applied must be verified through laboratory testing before application. Type of material(s) used for composting must be documented. C:N ratio analyses must be from no later than 6 months before compost application.
- c. Compost used in this practice must be produced at the agricultural operation where the project is located. Externally sourced compost must be purchased from a certified facility.
- d. Compost used in this practice cannot be vermicompost.
- Whole Orchard Recycling: Implementation of this practice must meet the following requirements below:
 - Only orchards with trees at least ten years of age are eligible.

- Orchards should be chipped and incorporated in place on the field in which they were grown, without exporting chips off-site or to new fields.
- The WOR practice must not be implemented in soils with Soil Organic Matter greater than 20%.
- Chips must be evenly distributed throughout the orchard. If a service provider is contracted, their commitment to spread the wood chips must be in the contract/invoice for verification purposes.
- Chips must be incorporated into the soil to at least 6 inches depth.
- Effective Practice Implementation Acreage: The Program will consider the acreage of orchard and vineyard alleys as the effective practice implementation acreage for cover crop, conservation cover, reduced-till and no-till practices. For the purposes of the HSP, effective practice implementation acreage is considered 70% of the whole field acreage for orchard alleys, and 60% for vineyard alleys.

• Non-Overlapping Practices

For the purposes of the HSP, practices in the same group cannot be implemented on the exact same land area or field, i.e., cannot overlap or be on top of each other. CDFA HSP Re-Plan Tool is designed to facilitate applicants avoid selection of non-overlapping practices.

- o Group I:
 - Cover Crop (USDA NRCS CPS 340)
 - Conservation Cover (USDA NRCS CPS 327)
 - Conservation Crop Rotation (USDA NRCS CPS 328)
 - Strip Cropping (USDA NRCS CPS 585)
 - Mulching: Wood Chip (USDA NRCS CPS 484)
- Group II: Compost Application (USDA NRCS CPS 808): Compost must either be
 - Purchased from a Certified Facility, or,
 - On-farm Produced Compost
- o Group III:
 - Mulching (USDA NRCS CPS 484)
 - Whole Orchard Recycling (USDA NRCS CPS 808)
- o Group IV:
 - Conservation Cover (USDA NRCS CPS 327)
 - Contour Buffer Strips (USDA NRCS CPS 332)
 - Field Border (USDA NRCS CPS 386)

- Filter Strip (USDA NRCS CPS 393)
- Forage and Biomass Planting/Pasture and Hay Planting (USDA NRCS 512)
- Grassed Waterway (USDA NRCS CPS 412)
- Herbaceous Wind Barrier (USDA NRCS CPS 603)
- Range Planting (USDA NRCS CPS 550)
- Riparian Herbaceous Cover (USDA NRCS CPS 390)
- Vegetative Barriers (601) (USDA NRCS CPS 601)
- Residue and Tillage Management No-Till (USDA NRCS CPS 329)
- Residue and Tillage Management Reduced Till (USDA NRCS CPS 345)
- Group V:
 - Alley Cropping (USDA NRCS CPS 311)
 - Hedgerow Planting (USDA NRCS CPS 422)
 - Multi-story Cropping/Forest Farming (USDA NRCS CPS 379)
 - Riparian Forest Buffer (USDA NRCS CPS 391)
 - Tree/Shrub Establishment (USDA NRCS CPS 612)
 - Windbreak/Shelterbelt Establishment (USDA NRCS CPS 380)
 - Silvopasture (USDA NRCS CPS 381)
 - Residue and Tillage Management No-Till (USDA NRCS CPS 329)
 - Residue and Tillage Management Reduced Till (USDA NRCS CPS 345)
 - Group VI:
 - Any herbaceous planting practice listed in Group IV and Mulching (USDA NRCS CPS 484)

Note: There may be practices (individual or combination) in addition to those listed above that may not overlap for a specific project. These may be evaluated by CDFA on a case-by-case basis and addressed during pre-project consultation.

- Requirements noted in <u>Appendix A</u> must be followed for all HSP practices.
- Applicants must use the <u>CDFA HSP RePlan Tool</u> to develop their project site map, determine if they may be located in AB 1550 Priority Populations and provide benefits to AB 1550 Priority Populations, eligibility for compost application, and assistance in selecting species to be planted for specific practices based on the <u>USDA - NRCS California eVegGuide</u>.
- CDFA strongly encourages applicants to enhance on-farm biodiversity through utilizing plant species (in applicable management practices) that

support pollinator habitat and help meet the goals identified in the <u>California Biodiversity Action Plan</u>.

Practice Implementation Requirements

For the purpose of this program, a Treatment field (T) is defined as a field where at least one of the <u>Eligible Agricultural Management Practices</u> will be implemented that has not been implemented previously; a Control field (C) is defined as a field which includes the current management practices being implemented on the project site, to serve as a comparison to T.

For both Type A and Type B projects:

- A Project must include at least one of the <u>Eligible Agricultural</u> <u>Management Practices</u> to be implemented on T where it has not been implemented previously.
- A Project must also include C to serve as a comparison to T.
- T and C should be located side-by-side and differ from each other with respect to the presence (or absence) of new management practice(s) implementation while keeping all other field activities the same as much as possible.
- When selecting locations in the APN to lay out T and C, ensure field conditions such as soil properties, drainage, landscape, and cropping and management histories and size are as similar as possible.
- T and C must not be changed to a different location within the APN during the complete project term.

For all Type A projects:

- Each T must have a corresponding C.
- Plot size of T and C must be equal and large enough to allow meaningful data collection and farming operation based on practice(s) selected.
- A minimum of three replicates for each T and C is required.

Data Collection Requirements

Required for both Type A and Type B projects:

The following data collection will be required for both T and C in each APN identified in the project (and <u>Project Reporting Requirements</u>).

- Soil organic matter content
 - Prior to initial implementation of funded practice(s) (baseline data)
 - One year after implementation of funded practices
 - Two years after implementation of funded practices

- Three years after implementation of funded practices
- Soil Water Parameters (See references in <u>Appendix C</u>)
 - \circ Soil water infiltration
 - Soil aggregate stability

Required for Type A projects:

- On-farm GHG emissions from soils
 - Measurements of GHGs emissions are required to be taken during the entire project term from Treatment and Control plots involved in the demonstration project. While measurements of N₂O emissions are required for all projects, measurements of CO₂ and CH₄ may also be taken depending on the practice(s) to be implemented. Applicants should conduct a thorough literature review on possible impacts on GHGs emissions from implementation of the selected practice(s) and determine if CO₂ and CH₄ are to be measured. Justifications are required if measurements of CO₂ and/or CH₄ gases are not to be taken. For all GHGs to be measured, a detailed and literature-supported data collection scheme should be presented.
 - Sampling frequency for GHG emission measurements should be selected such that it allows collections of both baseline and peak GHG fluxes data associated with practice implementation, weather conditions, and field operations, and that data collected should be sufficient to estimate annual GHG emissions for each treatment and control. (See references in <u>Appendix D</u>)
- Crop yield data per year.

Optional for both Type A and Type B projects:

- Additional data on soil health¹, soil water content, co-benefits, and ecosystem services.
- Detailed economic analyses on production profitability for selected practice(s).

Outreach Requirements

• Outreach requirements apply to both Type A and Type B projects. Outreach to demonstrate implementation of HSP practices and associated benefits must include a minimum of 80 unique California-

¹ To determine what kinds of data may be considered indicators of soil health, please see Table 2.02 in the Comprehensive Assessment of Soil Health: The Cornell Framework (2017) at <u>https://soilhealth.cals.cornell.edu/training-manual/</u>.

based farmers and/or ranchers for the duration of the grant agreement term. Farmers and ranchers may attend the demonstration project site(s) in-person or virtually so the grant recipients can showcase implementation methods and share information on benefits and co-benefits from the implemented management practice(s).

- For outreach purposes, farmer/rancher attendees may include farm/ranch owners, their employees including certified crop advisors (CCAs), pest control advisors (PCAs), other key farm advisors as justified, and climate smart agriculture technical assistance providers who are not HS Demonstration Program grant recipients.
- Grant recipients must conduct at least three field days during the grant term at the project site to showcase HSP practices to other farmers and ranchers. Grant recipients may meet the outreach requirement through outreach and education efforts conducted in addition to the mandatory field days. Outreach events may include presentations at California-specific conferences or meetings where farmers and ranchers are present as participants. However, the additional efforts may not replace the mandatory field days.
- A list of farmers and ranchers present at outreach events (for example, sign in-sheets or conference registration logs specifically showing attendance at the HSP project event and identifying as farmers/ranchers) must be compiled by grant recipients and included in reports to CDFA.
- Requirements for a demonstration field day event:
 - The grant recipient must be the host or co-host.
 - The funded project must be the focus of the event.
 - The attendees must see the project site either in-person or virtually.
- Requirements for other outreach activities such as conference/ meeting presentations and/or workshops in which California farmers/ranchers are participating:
 - Information for the funded project must be presented to the audience including practice implementation method, status, and associated benefits.
 - Only attendees at the specific section presented by the recipient should be counted towards the recipient's outreach numbers.
- Grant recipients are encouraged to share their outreach events with CDFA and have information to be posted on the HS Demonstration Program website. Event information should be emailed to the program staff at least two weeks in advance. For events to be posted on the

program website, the recipient should provide the date, time, location, and contact information for a designated project representative (e.g., name, email, and phone number), registration link as applicable, and a short description of the event. The designated project representative will be responsible for managing public inquiries about the demonstration site, including attendance of interested parties at outreach events, and ensuring sufficient availability of the demonstration site to meet the outreach and education requirements of the program.

 CDFA encourages creative approaches (e.g., holding outreach events multiple times in a year) to attract new individuals and support those already familiar with <u>Eligible Agricultural Management Practices</u> to the sites in order to share knowledge and benefits of eligible agricultural management practices. Approaches such as using SMART (Specific, Measurable, Achievable, Relevant and Time-bound) goals are encouraged.

Outreach Topics

CDFA encourages recipients to include topics that help farmer/rancher attendees make informed decision on practice selection and implementation to maximize the benefits for their fields/crops. Based on practice(s) demonstrated in the projects, questions to address during outreach events may include:

- Which agricultural system(s) can benefit from the practice demonstrated?
- When and how to implement the practice for a specific agricultural system(s) so that implementation is successful, and the expected benefits can be achieved?
- What information needs to be checked prior to or when purchasing materials for practice implementation and why is the information important? Some examples are provided below.
 - Compost (or other soil amendments) analytic report: C:N ratio, pH, soluble salts, electrical conductivity, and/or mineral nutrient content, etc.
 - Seedlings or seeds for planting practices: species characteristics, annual vs. perennial, introduced vs. native, drought and/or cold tolerance, possible benefits provided, and maintenance requirements (e.g., protection, irrigation).
- Cost effectiveness of the practices, as applicable.

Recipients will be required to provide documentable outreach and attendance records as part of the project reporting to CDFA (See <u>Project</u> <u>Reporting Requirements</u>).

Ten percent of the total grant funding amount will be withheld until successful project implementation is verified and evaluation of final reporting documents is complete.

Project Duration and Timeline

The project duration will be from the official grant start date to November 30, 2027. The official grant start date for individual awarded project is determined based on the date of grant agreement execution or the grant term start date on the first page of the agreement, whichever date is later. Timeline for funding expenditures of awarded projects is provided in the table below.

Project Year	Duration of Project Year
1	Date of grant agreement execution – December 31, 2024
2	January 1, 2025 – December 31, 2025
3	January 1, 2026 – December 31, 2026

Project Budget

The HS Demonstration Program will provide funds for the entire grant term.

Allowable Costs

Project costs must be itemized and clearly support implementation of eligible agricultural management practices including supplies, special purpose equipment, labor, and any other allowable costs necessary for project implementation. Project costs must be reasonable and consistent with costs paid for equivalent work on non-grant funded activities or for comparable work in the labor market. Applicants should utilize equipment or tools they already have on-hand to implement the proposed project.

Examples of allowable costs include but are not limited to:

- Cost of implementation of proposed eligible agricultural management practices.
- Cost associated with on-farm GHG measurements for Type A projects.
- Cost of data analyses for soil organic matter content, other soil health data, ecosystem service and/or yield data.
- Travel expenses such as mileage, lodging, per diem, vehicle rental etc. for outreach or meetings. Expenses must be reasonable and appropriate for the purpose and nature of the meeting. Allowable costs should follow <u>California State Human Resources (CalHR) policy</u> except for awards to the

Regents of the University of California (UC) which should follow the established UC policy.

- Costs of meals/snacks/refreshments may be allowed when reasonable and necessary for hosting an official demonstration of the project's eligible agricultural management practices (excluding travel meal costs). Expenses must be reasonable and appropriate for the purpose and nature of the meeting. Allowable costs should follow <u>California State</u> <u>Human Resources Policy (CalHR)</u> except for awards to the Regents of the University of California (UC) which should follow the established UC policy. A few basics which are often considered reasonable and appropriate to purchase meals/refreshments include meetings/demonstrations conducted in remote locations, lasted 4+ hours in length, and during extreme weather.
- Cost of materials needed for outreach activities (e.g., printed handouts or brochures) and/or other associated cost (e.g., chair/tent rental).

Unallowable Costs

Unallowable costs include, but are not limited to:

- Costs incurred outside of the grant term.
- Training costs to obtain professional certification and certification costs for project award recipients.
- Costs covered by another State or Federal grant program.
- Pre-development costs for project design, grant application preparation, and other activities.
- General purpose equipment which is not specific for the proposed research, scientific or technical activities specific to project needs and not utilized for other purposes (e.g., office equipment and furnishings, or farm equipment used for non-project purposes).
- Farm equipment purchases may not be allowed for projects without reasonable justification demonstrating that the equipment is critical for widespread adoption of practice(s) by farmers and ranchers and is necessary for demonstration purposes.
- Purchasing project-specific tools and equipment with a useful life of less than two years.
- Expenditures for purchasing or leasing land or buildings.
- Cost of travel to international locations and states with discriminatory laws consistent with <u>AB 1887.</u>

Indirect Costs

University of California (UC) and California State Universities (CSU) may claim their established indirect cost rate with CDFA. All other eligible organizations for HSP Demonstration Projects may claim an indirect cost rate not to exceed 25 percent of total direct costs.

Cost Share

Though not required, applicants can use cost share funds during grant implementation. Cost share can be in the form of matching funds or an in-kind contribution. Matching funds refers to a dollar amount committed to a project from a source other than the HSP Demonstration Project. An in-kind contribution is the estimated dollar value of any time, property, or supplies donated to a project, including costs associated with labor for work involved in the implementation of the proposed project.

GHG Reductions Estimations

All applicants must provide an estimation of annual GHG emissions reduction benefits from implementing the selected <u>Eligible Agricultural Management</u> <u>Practices.</u>

For practices that are listed under Practices for Type B Demonstration Projects, an estimation of GHG emissions reduction benefits must be submitted using the Quantification Methodology (QM) and calculator tools developed by the California Air Resources Board (CARB). The QM and Calculator Tool are adapted from the USDA-NRCS COMET-Planner methodology. The QM and calculator tool used for HSP are available at

https://ww2.arb.ca.gov/resources/documents/cci-quantification-benefits-andreporting-materials and http://comet-planner-cdfahsp.com/. COMET-Planner Report will be generated upon completion of the calculation, which must be included as part of the application.

For practices that are listed under <u>Practices for Type A Demonstration Projects</u>, a QM and Calculator Tool is not available. Recipients are required to report to CDFA annual GHG emissions reductions based on on-farm measurements associated with the implementation of each proposed practice annually through the grant duration. In the application, applicants must provide justification and/or an estimation of annual GHG emissions reduction benefits in metric ton CO₂ equivalent from implementing the proposed practice(s) based on available scientific literature to date. Methodology and plan for GHG data collection must be described in detail.

Grant Application Process

How to Apply

CDFA uses an online application platform to accept applications. The application portal link can be accessed through <u>the HS Demonstration Program</u> website. Applicants must create a user account to submit a grant application. All applications, supporting documents, and submissions are subject to public disclosure, including posting on the CDFA website.

The application package will cover the following areas to assess the quality of the application and the expertise of the applicant organization(s): 1) Opportunity Details, 2) Project Information, 3) Application Forms, 4) Budget Template, and 5) Submission. For more details, please review <u>Preview of Application Questions</u>.

Applicants are encouraged to gather all required information using information provided under <u>Required Application Documents</u> to facilitate effective and timely submission of the grant application.

Workshops and Application Assistance

CDFA will conduct two online workshops on the HS Demonstration Program grant application process and program requirements.

CDFA cannot assist in the preparation of grant applications; however, general questions may be submitted to cdfa.HSP_Tech@cdfa.ca.gov. CDFA will conduct two rounds of Questions and Answers to address general questions about the application submission process and program requirements. Responses to all questions received during the workshops or by email will be posted to the HS <u>Demonstration Program</u> website according to the schedule below.

Questions Received by	Answers Provided by	
July 14, 2023	July 21, 2023	
August 4, 2023	August 11, 2023	

For details on the CDFA grant application workshops and registration information, visit the HS Demonstration Program website: https://www.cdfa.ca.gov/oefi/healthysoils/DemonstrationProjects.html.

Required Application Documents

All required application documents must be submitted by the deadline specified in this solicitation. In addition to the mandatory and optional

attachments each applicant will provide, applicants must download, complete and upload the following templates from the HS Demonstration Program website, <u>https://www.cdfa.ca.gov/oefi/healthysoils/DemonstrationProjects.html</u>:

- Project Narrative Template
- Project Work Plan Template
- Project Budget Template

The mandatory and applicable attachments include:

- Resumes/CVs of PI and other lead persons
- CDFA HSP RePlan Report (pdf) Project Site Map
- CDFA HSP RePlan Report (excel)
- Project Design Schematic
- CDFA HSP COMET-Planner Report (Type B projects)
- Landowner Agreement*
- A Grazing Management Plan for Prescribed Grazing Practice*
- Applicant organization's Indirect Rate Policy*
- Letters of Support from cooperator/collaborator letters* (* If applicable)

Applicants are encouraged to review <u>Preview of Application Questions</u> to help them prepare applications.

Review and Notification

Review Process

CDFA will conduct multiple levels of review during the grant application process. The first level review is an administrative review to determine whether application documents and program requirements were met and if applicable, assess an applicant's past CDFA grant performance. All required documentation must be submitted to avoid disqualification.

The second level is a technical review conducted by the HSP Technical Advisory Committee (TAC) to evaluate the merits of the application and overall expected success of the project, including sufficient data generated to demonstrate the expected benefits on GHG emission reductions, carbon sequestration, soil health improvement, and dissemination of the information to wide audience including but not limited to industry stakeholders and community members. The TAC comprises of subject matter experts affiliated with state and federal agencies. CDFA will take applicants' past grant performance into consideration when determining awards of new projects in consultation with the CDFA Secretary and the TAC. Past performance may include, but is not limited to, timely completion of projects, submission of all required documentation and data during and after project completion, termination of projects by CDFA due to lack of progress, and termination of projects by the recipient that had incurred grant costs and have not returned the funds to CDFA.

Evaluation Criteria

Applications are evaluated based on the following criteria. Detailed information is provided under <u>Appendix B: Detailed Scoring Criteria</u>. Applications will be scored and ranked in order of highest score to lowest score to be considered for funding.

Criteria	Score
Project Merit:	
Type A Projects: a. Demonstration Component b. Outreach Component	25 15
Type B Projects:	
a. Demonstration Component	15
b. Outreach Component	25
Project Timeline and Implementation Plan	15
Project Team Qualifications	10
Project Budget and Justification	20
GHG Emission Reduction Benefits	15
Past Performance Evaluation (applicable	Project not funded if minus
for applicants funded in previous rounds)	30 or greater
Total	100

Funding Priority

The Healthy Soils Program aims to allocate Twenty-five percent (25%) of the total grant funds to projects that benefit Socially Disadvantaged Farmers or Ranchers (SDFRs). "Socially disadvantaged farmer or rancher" means a farmer or rancher who is a member of a socially disadvantaged group. "A Socially disadvantaged group" is defined by <u>2017 Farmer Equity Act</u> (AB 1348 (Aguiar-Curry, 2017)) as a group whose members have been subjected to racial, ethnic, or gender prejudice because of their identity as members of a group without regard to

their individual qualities. These groups include all of the following: (1) African Americans (2) Native Indians (3) Alaskan Natives (4) Hispanics (5) Asian Americans (6) Native Hawaiians and Pacific Islanders. The Healthy Soils Program strongly encourages, when feasible, demonstration project location selection and/or outreach is designed to benefit SDFRs and farms and ranches that are 500 acres or less. Program also encourages applicant to partner with regional organizations with expertise in multilingual outreach and education. In addition to SDFRs, CDFA also encourages applicants to facilitate outreach and grants outreach and grants to projects that benefits disadvantaged communities as defined in <u>SB 535</u> and low-income populations as defined in <u>AB</u> 1550. Priority populations can be identified using the mapping tools provided by CARB at https://webmaps.arb.ca.gov/PriorityPopulations/. Projects are not required to provide benefits to priority populations. However, projects that are determined to be providing benefits may be prioritized for funding. Projects benefitting Priority Populations will be identified automatically by the <u>CDFA HSP</u> RePlan Tool based on project location and net criteria air pollutant emission reductions determined consistent with the CARB Healthy Soils Quantification Methodology and Co-Benefits Calculator Tool available at: https://ww2.arb.ca.gov/resources/documents/cci-guantification-benefits-andreporting-materials.

Additional Consideration

Management practices may vary with climatic regions, soil conditions, and crop production systems. Therefore, projects with greater regional and crop production representation may be given additional consideration during the review and evaluation process to achieve widespread adoption of the management practices in the state. In case of insufficient funds, projects that emphasize the above considerations may be prioritized if they are scored the same.

Disqualifications

During the administrative review, the following will result in the disqualification of a grant application:

- Applications with one or more unanswered questions necessary for administrative and/or technical review.
- Applications with missing, blank, unreadable, corrupt, or otherwise unusable attachments.
- Applications requesting funding for more than the maximum award amount.

- Applications with unallowable costs or activities not necessary to complete the project objectives.
- Applications requesting grant funds to cover activities outside the grant duration.
- Applications that do not comply with <u>Eligibility and Exclusions</u> or do not meet <u>Program Requirements</u>.

Appeal Rights

Any discretionary action taken by the Office of Environmental Farming and Innovation (OEFI) may be appealed to CDFA's Office of Hearings and Appeals Office within ten (10) days of receiving a notice of disqualification from CDFA. The appeal must be in writing and signed by the responsible party named on the grant application or the authorized agent. It must state the grounds for the appeal and include any supporting documents and a copy of the CDFA-OEFI decision being challenged. The submissions must be emailed to <u>CDFA.LegalOffice@cdfa.ca.gov</u> (preferred) or sent to the California Department of Food and Agriculture Office of Hearings and Appeals, 1220 N Street, Sacramento, CA 95814. If submissions are not received within the time frame provided above, the appeal will be denied.

Notification and Feedback

All applicants will be notified by email regarding the status of their grant application. Successful applicants will receive instructions regarding award process. Applicants whose applications not selected for funding will receive feedback on their applications upon request within 90 days after receiving notification.

Award Process

Pre-Project Consultation

After receiving notification of award, the awardee may be contacted by CDFA via email to conduct a pre-project consultation. In some cases, a phone call with the awardee may be necessary. The purpose of the pre-project consultation is to ensure that practices and implementation methods in the funded project are compliant with the <u>Program Requirements</u>.

Grant Agreement

CDFA will initiate the Grant Agreement process with awardees selected to receive a HS Demonstration Program grant award. The process of executing a grant agreement is estimated to take several months. Following a pre-project consultation (if needed), awardees will receive a Grant Agreement package via email with specific instructions regarding award requirements including information on project implementation, project reporting, verification, and payment process. Communication during the grant execution process is done primarily via email. CDFA reserves the right to rescind an award due to lack of response from an award recipient.

Grant Agreement Stage	Estimated Time for Stage Completion
Grant packet is completed – during this step, CDFA will work with awardees to get the information necessary to execute the grant agreement. Timeline for this step is dependent on how promptly information is provided to	Variable
Grant gareement execution	Up to 120 days
Processing advance payments – if awardees request and are granted approval for an advance payment, it takes approximately 45 days to process this payment after execution of the grant agreement.	Approximately 45 days

Grant Recipient Requirements

Project Implementation

Implementation should not begin prior to grant agreement execution, or the agreement term start date on the first page of the agreement, whichever date is later. Implementation of some eligible management practices such as cover crop are encouraged to begin prior to December 31 in each project year to allow adequate time for plant establishment and biomass accumulation.

Recipients are responsible for the overall management of the awarded project to ensure all project activities are completed as identified in the grant agreement. Failure to do so may result in all or any portion of the grant funding withheld or termination of the Grant Agreement.

Reporting Requirements

Recipients are responsible for keeping CDFA up to date on grant activities. There are three main reporting categories.

Quarterly Progress Check-in

Recipients are required to report quarterly to CDFA to update practice implementation, data collection and/or outreach activities accomplished during the reporting period. Outreach documents in the reporting period should be sent to CDFA as applicable. The quarterly report may be submitted together with recipients' quarterly invoicing documents. Recipients are required to notify CDFA in advance when foreseeing any delays or changes in project implementation.

Annual Program Conference

Recipients are required to attend annual program conferences hosted by CDFA. The conference may be divided into sessions grouped by practices. The conferences will be held online. Recipients are required to:

- Present their project progress and discuss related topics. Newly awarded recipients are not required to present at their first meetings but encouraged.
- Submit a summary of presented Demonstration project (using CDFA provided Template) to be published in the conference proceedings and posted at the program website.

Final Reporting

Final Performance Reporting documents must be submitted no later than 30 calendar days following the expiration date of the grant agreement or after the project is complete, whichever comes first. The final reporting documents include a final overall project implementation report, project data report for all required data in excel (Type A projects only), and outreach attendance tracking sheet. CDFA will provide reporting templates.

CDFA may compile technical reports for all closeout projects to be published on the program website.

Information to be provided to CDFA may include (if not specified, applied to both Type A and B projects):

- Management practice implementation activities and impacts.
- Annual soil organic matter content and soil water parameters data.

- GHG fluxes and annual emissions data, crop yield or economic analysis (Type A Projects only).
- Other co-benefits and ecosystem services data and other data collected as specified in the agreements.
- Outreach activities and impacts, including California farmer/rancher attendance report.
- Upon completion of project, barriers encountered and overcome, and recommendations for successful implementation.

Payment Process

CDFA will provide the grant recipient with the necessary grant award and invoicing documents. Grant recipients will be required to submit a quarterly invoice for reimbursement of actual expenses incurred to support the approved project activities. Invoice must include documentation to support the reimbursement requested. Salary and wage amounts charged to grant-supported projects or programs for personnel services must be based on an adequate payroll distribution system that documents such distribution in accordance with generally accepted practices of like organizations. Grant recipients may be eligible to receive an advance payment up to 25 percent of the total grant award to begin project implementation (See <u>Advance</u> <u>Payments</u>). The remaining funds will be allocated on a reimbursement basis through quarterly invoicing.

Advance Payments

If selected for funding, recipients may be eligible for advance payments of up to 25 percent of the grant award, subject to the provisions of section 316.1 "Advance Payments" of the <u>California Code of Regulations, Division 1, Chapter 5</u>.

Project Verification

Recipients will be subjected to verification that the eligible agricultural management practices are implemented in a manner consistent with the USDA NRCS CPS guidelines, <u>Appendix A</u>, and the Scope of Work in the grant agreements. Verification will be conducted by CDFA who may conduct field evaluations by APN and/or remote evaluations via phone, video conferencing, or emails to verify program compliance during the grant agreement term. CDFA may request any or all documents listed in <u>Appendix A</u> in order to successfully complete project verification.

The purpose of project verification is to determine whether and when deliverables are being met and evaluate project completeness to ensure the implementation of eligible agricultural management practice(s) and project goals are completed within the grant agreement term. Recipients may be required to submit financial records and project related documentation (such as receipts for payment of services/goods) to ensure HSP Demonstration Projects funds are used in compliance with the Grant Agreement terms and conditions. Specific verification requirements for project implementation will be provided in the Grant Awards Procedures (GAP) manual.

CDFA will withhold up to 10 percent from the total grant award until the verification is completed for successful project implementation.

The State of California has the right to review project documents and conduct audits during project implementation and over the project life.

Post-Project Completion Requirements

Execution of the Grant Agreement is conditional upon the agreement to postproject completion requirements. Recipients are required to maintain implementation of practices funded through this program through the project term. However, benefits on soil health and its associated environmental cobenefits and ecosystem services from implementation of practices are expected to be achieved in the long term. Recipients are encouraged to continue and/or expand these practices on their operations to achieve longterm benefits. Additionally, grant recipients are required to retain documentation related to the HSP funded project, including records documenting maintenance of the agricultural management practice(s), any soil testing reports for the project APNs, and records of actual benefits achieved from the project up to three (3) years after project completion.

Failure to work with CDFA to provide the necessary project-related documentation will be considered non-performance. In the event of nonperformance, CDFA may take any action deemed necessary to recover all or any portion of the grant funding.

CDFA will contact a randomly selected subset of awarded projects to collect data including, but not limited to, eligible agricultural management practice implementation and GHG emissions reduction estimates, for three years after project completion.

State Audit and Accounting Requirements

In addition to HSP program requirements, awarded projects may be subject to State Audit and Accounting Requirements listed below.

Audit Requirements

Projects are subject to audit by the State annually and for three (3) years following the final payment of grant funds. If the project is selected for audit, Grantee will be contacted in advance. The audit shall include all books, papers, accounts, documents, or other records of Grantee, as they relate to the project. All project expenditure documentation should be available for an audit, whether paid with grant funds or other funds.

Grantee must have project records, including source documents and evidence of payment, readily available and must provide an employee with knowledge of the project to assist the auditor. Grantee must provide a copy of any document, paper, record, etc., requested by the auditor.

Accounting Requirements

Grantee must maintain an accounting system that:

- Accurately reflects fiscal transactions, with the necessary controls and safeguards.
- Provides a good audit trail, including original source documents such as purchase orders, receipts, progress payments, invoices, employee paystubs and timecards, evidence of payment, etc.
- Provides accounting data so the total cost of each individual project can be readily determined.

Records Retention

Records must be retained for a period of three (3) years after final payment is made by the State. Grantee must retain all project records at least one (1) year following an audit.

Appendix A: Practice Implementation Guidelines and Requirements

Agricultural System	HSP Practice	Practice Implementation	Payment Scenario	Number of Years to be Paid	Required Document / Information at Application	Implementation Guidelines
Cropland	Alley Cropping (NRCS CPS 311)	Replace 20% of Annual Cropland with Woody Plants	Tree- planting, single row	1	Tree crop name(s)	 Potted seedling size at ≥2 gal; (2) Plant density at ≥40 trees/acre; (3) Tree protection and irrigation.
Compost Application	Compost Application	Compost (C:N ≤ 11) application to annual crops	3 - 5 tons/Acre	3	Compost C:N ratio, Application Rate	(1) Application rate must be between 3-5 tons/acre for compost with C:N≤11 and 6-8 tons/acre for compost with C:N>11. (2) Compost materials, method and Composting process must be documented. (3) Feedstocks may
Cropland	(NRCS CPS 808), on-farm produced compost	Compost (C:N > 11) application to annual crops	6 - 8 tons/Acre	3	Compost C:N ratio, Application Rate	include green materials, food materials, wood waste, yard trimmings, agricultural materials or biosolids as defined in 14 CCR Section 17852 (https://www.law.cornell.edu/regulations/california/14-CCR- 17852).
Cropland	Compost Application (NRCS CPS	Compost (C:N ≤ 11) application to annual crops	3 - 5 tons/Acre	3	Compost C:N ratio, Application Rate	Application rate must be between 3-5 tons/acre
Cropland 808), purchased compost	Compost (C:N > 11) application to annual crops	6 - 8 tons/Acre	3	Compost C:N ratio, Application Rate	Application rate must be between 6-8 tons/acre	
Conservation Cropland Cover (NRCS CPS 327)		Convert Irrigated	Introduced species	1	Introduced perennial	 Seeding rate at 21-40 pure live seeds per sqft; (2) Plant protection from animal damage and growth maintenance.
	or Non-Irrigated Cropland to Permanent	Introduced species with foregone income	1	species	 Seeding rate at 41-60 pure live seeds per sqft; (2) Plant protection from animal damage and growth maintenance. 	
	Conservation	Conservation Cover (NRCS CPS 327) Unfertilized Grass or Grass/Legume cover	Monarch species – mix species	1	Mix of native perennial grass &	(1) At least 4% native milkweeds (Asclepias spp.) and le
	Cover (NRCS CPS 327)		Monarch species – mix species with foregone income	1	torbs including native milkweeds for wildlife, pollinators, or ecosystem restoration	than 50% grasses; (2) Seeding rate at 21-40 pure live seeds per sqft; (3) Plant protection from animal damage and growth maintenance.
			Native species	1	Mix of pativo	(1) Seeding rate at 21-40 pure live seeds per sqft; (2) Plan
			Native species foregone income	1	perennial species	protection from animal damage and growth maintenance.

Agricultural	ЦСР	Prostino		Number of	Required Document	
System	Practice	Implementation	Payment Scenario	Years to	/ Information at	Implementation Guidelines
		Convert Irrigated		be Paid	Application	
Conservation Cropland Cover (NRCS CPS 327)		or Non-Irrigated Cropland to	Pollinator species	1	Mix of native	(1) Mixed native species with less than 50% arasses: (2)
	Conservation Cover (NRCS CPS 327)	Permanent Unfertilized Grass or Grass/Legume cover	Pollinator species with foregone income	1	perennial grasses, legumes, and forbs to provide habitat for pollinators	Seeding rate at 21-40 pure live seeds per sqft; (3) Plant protection from animal damage and good maintenance.
Cropland	Conservation D Crop Rotation Free	Decrease Fallow Frequency or Add	Basic rotation	3	A rotation plan including all crops in the sequence with at	Effective implementation of the rotation plan to add higher residue and/or perennial crops to reduce erosion
	(NRCS CPS 328)	Rotations	Specialty crops	3	least one annual crop.	and increase other benefits.
Cropland	Cropland	Convert Strips of Irrigated or Non- Irrigated Cropland to Permanent Unfertilized Grass	Introduced species, foregone income	1	Perennial species	 (1) Width of strips: ≥15 ft wide if ≥50% grass species OR ≥30 ft wide when legume/forbs used alone, or ≥50% legumes; (2) Seeding rate at 41-60 pure live seeds per sqft; (3) Inoculate legumes at planting if legume is used; and (4) Good maintenance.
Strips (NRCS CPS 332)	Strips (NRCS CPS 332)		Native species, foregone income	1	Native perennial species	(1) Width of strips: \geq 15 ft wide if grass species consists of 50% or more OR \geq 30 ft wide when leaume/forbs are used
Cropland		or Grass/Legume cover	Wildlife Pollinator, foregone income	1	Native perennial species with at least 3 pollinator friendly species	alone, or legumes consist of 50% or more; (2) Seeding rate at 21-40 pure live seeds per sqft; (3) Inoculate legumes at planting if legume is used; and (4) Good maintenance.
		Add Legume or Non-Legume	One species	3	-	(1) Single or multiple species cover crop is planted without
Cropland	Cover Crop (NRCS CPS 340)	Seasonal Cover Crop to Irrigated or Non-Irrigated Cropland	Multiple species	3	Cover crop species	fertilizer. (2) Cover crop is allowed to grow to produce as much biomass as possible. (3) Cover crop biomass/residue should not be removed to other places.
Cropland Field Border (NRCS CPS 386		Convert Strips of Irrigated Cropland to Permanent Unfertilized Grass or Grass/Legume Cover	Introduced species	1	Introduced perennial species	(1) Seeding rate at 41-60 pure live seeds per sqft; (2) Maintain good plant growth during the project term.
	Field Border		Native Species	1	Native perennial species	 Seeding rate at 21-40 pure live seeds per sqft; Maintain good plant growth during the project term.
	(NRCS CPS 386)		Pollinator Species	1	Diverse mix of native perennial grasses, legumes and forbs that are pollinator friendly	 (1) Species flower throughout the growing season with ≤50% grasses in the mix; (2) Seeding rate at 21-40 pure live seeds per sqft; (3) Maintain plant growth in the project term.

Agricultural System	HSP Practice	Practice Implementation	Payment Scenario	Number of Years to be Paid	Required Document / Information at Application	Implementation Guidelines	
Filter Strip	Convert Strips of Irrigated Cropland to Permanent	Introduced species	1	Introduced perennial plant species	 Native perennial species; (2) Seeding rate at 41-60 pure live seeds per sqft; (3) Maintain good plant growth during project term. 		
Cropiana	(NRCS CPS 393)	Unfertilized Grass or Grass/Legume Cover	Native species	1	Native perennial plant species	 Introduced cool season perennial species; (2) Seeding rate at ≥60 pure live seeds per sqft; (3) Maintain good plant growth during the project term. 	
	_	Forage and Biomass Planting / Pasture and Hay Planting NRCS CPS 512) Crops	Nonnative, high seeding rate with lime or similar amendment	1	Perennial species	(1) Introduced pe (2) Seeding rate o	 Introduced perennial grasses, legumes, and/or forbs; Seeding rate of 30 lb./acre pure live seed (PLS) or 41- O pure live seeds per saft; (2) Lime application if
Cropland	Forage and Biomass Planting		Nonnative, high seeding rate without lime	1		applicable.	
(NRCS C	Hay Planting (NRCS CPS 512)		Nonnative, standard seeding rate with fertilizer	1		 (1) Introduced perennial grasses, legumes, and/or forbs; (2) Seeding rate of 9 lb./acre pure live seed (PLS) or 21-40 pure live seeds per sqft; (3) Fertilizer application if applicable. 	
			Nonnative, standard seeding rate without fertilizer	1			
Cropland	Grassed Waterway (NRCS CPS 412)	Convert Strips of Irrigated or Non- Irrigated Cropland to Permanent Unfertilized Grass or Grass/Legume Cover	Base Waterway, Pacific Region	1	Perennial species	(1) Planting area is from tops of the bank on both sides; (2) Perennial species at seeding rate ≥60 pure live seeds per sqft. (3) Plant maintenance.	
Cropland	Grassed Waterway (NRCS CPS 412)	Convert Strips of Irrigated or Non- Irrigated Cropland to Permanent Unfertilized Grass or Grass/Legume Cover	Base waterway with checks	1	Perennial species	 Planting area is from tops of the bank on both sides; (2) Perennial species at seeding rate ≥60 pure live seeds per sqft. (3) Fabric or stone checks installed every 100 feet along the waterway perpendicular to waterflow and 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Fabric Checks are installed 18" deep with 12" laid over on the surface. 	
Cropland	Hedgerow Planting (NRCS CPS 422)	Replace a Strip of Cropland with 1 Row of Woody Plants	Single Row	1	Hedgerow species	 (1) Pollinator-friendly trees, shrubs, and perennial wildflowers; (2) Plant density at ≥200 live plants/acre; (3) Average height at ≥3 feet and extend 15 feet wide at maturity; (4) Plant protection & irrigation. 	

Agricultural System	HSP Practice	Practice Implementation	Payment Scenario	Number of Years to be Paid	Required Document / Information at Application	Implementation Guidelines
Cropland	Herbaceous Wind Barriers (NRCS CPS 603)	Convert Strips of Irrigated or Non- Irrigated Cropland to Permanent Unfertilized Grass or Grass/Legume Cover	Cool Season Perennial Species	1	Cool season perennial species	(1) Plant species must be tolerant to soil deposition and stiff; (2) Width of the Herbaceous Wind Barrier must be at least 2 feet.
Cropland	and Mulching Add Mulch to	Add Mulch to Croplands	Natural Materials	3	Natural materials	(1) Materials produced off site; (2) ≥70% of the acreage covered by mulch materials at 1-3 inches thickness or 1-2 tons/acre if using straw. (3) Natural materials include chipped brush, bark, wood shavings, sawdust, leaves, leaf mold, pine needles, grass hay, rice hulls, grasses, grass clippings, crop residues, straw, almond/walnut shells, cocoa bean hulls or coconut fiber. Provide name(s) of natural material(s).
	, , , , , , , , , , , , , , , , , , ,		Wood Chips	1	Wood chips	(1) Materials produced off site (2) Wood Chips are characterized as chemically untreated, woody material that is ³ / ₄ -2 inches in diameter, without leaves and hardy enough to last for several years; (3) Mulch thickness at 2-4 inches; (4) Application rate at ≥40 cubic yards/acre or ≥10 tons/acre.
	Multistory	Replace 20% of Annual Cropland with woody plants	Native Tree or shrub planting	1	Native tree or shrub species	(1) Native seedlings with 50% medium size (1 quart to gallon pot or 10 cubic inches container); (2) Plant density at ≥40 live trees/acre; (3) Tree protection and irrigation.
Cropland	Cropland Cropping Annua /Forest Farming wit (NRCS CPS 379)		Nonnative tree or shrub planting	1	Nonnative tree or shrub species	(1) Shrub seedlings: bare root at 36-60 inches tall or container ≥20 cubic inches; tree seedlings: bare root or container ≥20 cubic inches; (2) Plant density at ≥40 live trees/acre; (3) Tree protection and irrigation.
Cropland	Nutrient Management (NRCS CPS 590)	Improved N Fertilizer Management on Irrigated or Non- irrigated Cropland - Reduce Fertilizer Application Rate by 15%	Basic nutrient management	3	An eligible field(s) is where synthetic nutrient fertilizers have been applied annually	 A nutrient management plan for each field/crop based on soil test analysis and University of California or CDFA recommended rates. A farming log records all fertilization activities (fertilizer name, nitrogen content, application rate & date) during each project year.
Cropland	Residue and Tillage Management, No-Till (NRCS CPS 329)	Convert Tillage to No Till on Irrigated or Non-irrigated Cropland	No-Till or Strip-Till	3	Tillage implemented prior to application deadline	 No tillage; (2) All plantings must no-till drill or broadcast if applicable. (3) Residues kept on soil surface, not burned, or removed; (4) A farming log recording all field activities related to soil disturbance, dates of activities and equipment used.

Agricultural System	HSP Practice	Practice Implementation	Payment Scenario	Number of Years to be Paid	Required Document / Information at Application	Implementation Guidelines
Cropland	Residue and Tillage Management, Reduce d Till (NRCS CPS 345)	Intensive Till to Reduced-Till on Irrigated or Non- irrigated Cropland	Reduced- Till	3	Conventional tillage implemented prior to application deadline	 (1) Tillage methods (Mulch/vertical tillage, chiseling, or disking) that limit soil disturbance, or (2) Fewer tillage operations. (3) Plant residue covering soil surface during winter- spring period; (4) A farming log recording all field activities related to soil disturbance.
			Bare-root, hand planted	1		(1) Seedling size: 18-36 inches tall or 10-20 cubic inches container for shrubs and hardwood; 1-year old seedlings or 4-6 cubic inches container for conifer; (2) Plant protection; (3) Plant density ≥35 live plants/acre.
	Riparian Forest	Replace a Strip of Cropland Near	Cuttings, Small to Medium Size	1	plants, Area of practice	 Size: 0.25-1 inch in diameter and 2-4 feet long; (2) Plant protection; (3) Plant density ≥35 live plants/acre.
Cropland	Buffer (NRCS CPS 391)	Water Courses or Water Bodies with Woody Plants	Cuttings, Medium to Large Size	1	implementation must be upgradient from and adjacent to a stream	 (1) Size: medium (0.25-1" diameter and 2-4' long) to large (2-6" diameter and 6' long); (2) Plant protection; (3) ≥35 live plants/acre.
			Small container, hand planted	1		 Potted seedling size: 1 quart to 1 gallon; (2) Plant protection; (3) ≥35 live plants/acre.
			Large container, hand planted	1		 Potted seedling size: 2 gallons or larger; (2) Plant protection; (3) ≥35 live plants per acre.
		Convert Irrigated or Non-Irrigated Cropland to Permanent Unfertilized Grass or Grass/Legume cover Near Aquatic Habitats	Broadcast Seeding	1	Native perennial species, Area of practice implementation must be upgradient from and adjacent to a stream	(1) Native perennial grasses, legumes, and forbs with ≤50%
			Broadcast Seeding with Foregone Income	1		at rate of 41-60 pure live seeds/sq ft; (3) Plant maintenance.
	Riparian		Plug Planting	1		(1) Native aquatic plants plug-planted; (2) Plant density at 19,360 plants/acre (3) Plant maintenance.
Cropland	Herbaceous Cover (NRCS CPS 390)		Combination Broadcast Seeding and Plug Planting	1		 Native perennial grasses, legumes, and forbs with ≥50% grasses; (2) Plug planting at density of 9,680 plants/acre and broadcast planting and/or no-till drill seeded at 41-60 pure live seeds/sq ft; (3) Plant maintenance.
			Pollinator Cover	1		(1) Native perennial species with ≤50% grasses; (2) 2-12 species to ensure ≥2 species in bloom at any given time of the growing season; (3) Broadcast or no-till drill seeded at rate of 41-60 pure live seeds/sq ft; (4) Plant maintenance.
Cropland	Strip Cropping (NRCS CPS 585)	Add Perennial Cover Grown in Strips with Irrigated or Non-Irrigated Annual Crops	Wind and water erosion control	1	Perennial species that are erosion resistant	 (1) Two or more strips are required; (2) ≥ 50% vegetation cover must be perennial and erosion resistant species. (3) Do not include erosion- susceptible crops in adjacent strips at the same time during the year.

Agricultural System	HSP Practice	Practice Implementation	Payment Scenario	Number of Years to be Paid	Required Document / Information at Application	Implementation Guidelines	
	Tree/Shrub	Conversion of Annual Cropland to a Farm Woodlot	Conservation, hand planted	1		 Shrub seedings at 6-18 inches tall or ≤10 cubic inches container; Tree or hardwood seedlings at 18-36 inches tall or 10-20 cubic inches container. Plant growth maintenance. Plant density: ≥150 live trees per acre 	
Cropland	Cropland Establishment (NRCS CPS 612)		Conservation, hand planted, browse protection	1	Tree and/or shrub species	 Shrub seedings at 6-18 inches tall or ≤10 cubic inches container; Tree or hardwood seedlings at 18-36 inches tall or 10-20 cubic inches container. (2) Plant protection from animal damage and wood stake to fasten plants in place. (3) Growth maintenance. (4) Plant density: ≥150 live trees per acre. 	
Cropland	Vegetative Barrier (NRCS CPS 601)	Convert Strips of Irrigated or Non- Irrigated Cropland to Permanent Unfertilized Grass or Grass/Legume Cover	Vegetative Planting	1	Perennial plant species - must meet stiffness index and is tolerant to soil erosion; Location is where sheet or rill erosion is of concern.	 Permanent strips of stiff, dense vegetation established along the general contour of slopes; with vegetation stiffness index (VSI) of 0.05-0.10; (2) Broadcast or drill seeds in a strip of 3 feet or wider; (3) plant maintenance. 	
Windbreak, Shelterbelt	Windbreak/ Shelterbelt	/ Replace a Strip of Cropland with 1 1-row, contained planted, t Row of Woody Plants 1-row, tre shrub, w protection	1-row, trees, containers, hand planted, with tree protected	1	Tree and/or shrub species	 Container seedlings at 15-20 cubic inches or bare root seedlings at 2-3 years old before transplanting (2) Plant protection and irrigation are required; (3) Plant density ≥200 live plants/acre. 	
	Establishment (NRCS CPS 380)		1-row, trees and/or shrub, with wind protection fence	1		(1) Container seedlings at 15-20 cubic inches or bare root seedlings at 2-3 years old before transplanting (2) A wind- protection fence and irrigation are required; (3) Plant density ≥200 live plants/acre.	
Orchard or	Compost Application	Compost (C:N ≤ 11) application Orchard or Vineyard	tion pr 2 - 4 tons/Acre	3	Compost C:N ratio, Application Rate	 Application rate must be between 2-4 tons/acre for compost with C:N≤11 and 6-8 tons/acre for compost with C:N>11. (2) Compost materials, method and Composting process must be documented. (2) Feedstocks may 	
Orchard or (N Vineyard 808 p	(NRCS CPS 808), On-farm produced compost	Compost (C:N >308), On-farm produced compostCompost (C:N >11) application Orchard or Vineyard6 - 8 tons/Acre	6 - 8 tons/Acre	3		include green materials, food materials, wood waste, yard trimmings, agricultural materials or biosolids as defined in 14 CCR Section 17852 (https://www.law.cornell.edu/regulations/california/14- CCR-17852).	
Orchard or Vineyard Orchard or Vineyard Orchard or Orchard or NRCS O 808), Purchas compo	Compost Application (NRCS CPS	Compost (C:N ≤ 11) application Orchard or Vineyard	2 - 4 tons/Acre	3	Compost C'N ratio	Application rate must be between 2-4 tons/acre	
	808), Purchased compost	808), Purchased compost	808), Purchased compost	Compost (C:N > 11) application Orchard or Vineyard	6 - 8 tons/Acre	3	Application Rate

Agricultural System	HSP Practice	Practice Implementation	Payment Scenario	Number of Years to be Paid	Required Document / Information at Application	Implementation Guidelines
		Introduced species	1	Introduced perophia	(1) Seeding rate at 21-40 pure live seeds/sqft; (2) Plant protection from animal damage and growth maintenance.	
			Introduced species with foregone income	1	species	(1) Seeding rate at 41-60 pure live seeds/sqft; (2) Plant protection from animal damage and growth maintenance.
		Convert Idle Land near Orchard/	Native species	1	Mix of native	(1) Seeding rate at 21-40 pure live seeds per sqft; (2) Plant
Orchard or Vinevard	Conservation Cover (NRCS	Vineyard to Permanent	Native species with foregone income	1	perennial species	protection from animal damage and growth maintenance.
	CPS 327)	or Grass/Legume cover	Monarch species – mix species	1	Mix of native perennial grass & forbs including native	(1) At least 4% native milkweeds (Asclepias spp.) and less
		Monarch species – mix species with foregone income	1	milkweeds for wildlife, pollinators, or ecosystem restoration	than 50% grasses; (2) Seeding rate at 21-40 pure live seeds per sqft; (3) Plant protection from animal damage and growth maintenance.	
Orchard or Vineyard Cover (NRCS CPS 327)	Convert Idle Land near Orchard/ Vinevard to	Pollinator species	1	Mix of native	(1) Mixed native species with less than 50% grasses: (2)	
	Conservation Cover (NRCS	Permanent Unfertilized Grass or Grass/Legume cover	Pollinator species with foregone income	1	legumes, and forbs to provide habitat for pollinators	Seeding rate at 21-40 pure live seeds per saft; (3) Plant protection from animal damage and good maintenance.
	CPS 327)	327) Plant Permanent Grass or Grass/Legume Cover in Orchard/ Vineyard Alleys	Orchard or Vineyard Alleyways	1	Perennial species	(1) Inoculate legumes at planting time if legume species is used, and (2) Maintain permanent vegetation
Orchard or	Cover Crop	(1) Add Legume or Non-Legume	One species	3		(1) Single or multiple species cover crop is planted without fertilizer. (2) Cover crop is allowed to grow to produce as
Vineyard	(NRCS CPS 340)	0) Orchard/ Vineyard Allevs	Multiple species	3	Cover crop species	much biomass as possible. (3) Cover crop biomass/residue should not be removed to other places.
Orchard or	Filter Strip	Convert Idle Land Near Orchard/ Vineyard to Permanent Unfertilized Grass or Grass/Legume Cover	Introduced species	1	Introduced perennial species	(1) Native perennial species; (2) Seeding rate at 41-60 pure live seeds per sqft; (3) Maintain plant growth.
Orchard or Vineyard (1	(NRCS CPS 393)		Native species	1	Native perennial species	 Introduced perennial species; (2) Seeding rate at ≥60 pure live seeds per sqft; (3) Maintain plant growth.

Agricultural System	HSP Practice	Practice Implementation	Payment Scenario	Number of Years to be Paid	Required Document / Information at Application	Implementation Guidelines
Orchard or Vineyard	Hedgerow Planting (NRCS CPS 422)	Plant 1 Row of Woody Plants on Border of Orchard/Vineyard	Single Row	1	Hedgerow species	 (1) Pollinator-friendly trees, shrubs, and perennial wildflowers; (2) Plant density at ≥200 live plants/acre; (3) Average height at ≥3 feet and extend 15 feet wide at maturity; (4) Plant protection & irrigation.
Orchard or Mulching Vineyard (NRCS CPS 484)	Add Mulch to Orchard or Vineyard	Natural Materials	3	Natural materials	(1) Materials produced off site; (2) ≥70% of the acreage covered by mulch materials at 1-3 inches thickness or 1-2 tons/acre if using straw. (3) Natural materials include chipped brush, bark, wood shavings, sawdust, leaves, leaf mold, pine needles, grass hay, rice hulls, grasses, grass clippings, crop residues, straw, almond/walnut shells, cocoa bean hulls or coconut fiber. Provide name(s) of natural material(s).	
		Wood Chips	1	Wood chips	(1) Materials produced off site (2) Wood Chips are chemically untreated, woody material that is ³ / ₄ -2 inches in diameter, without leaves and hardy enough to last for several years; (3) Mulch thickness at 2-4 inches; (4) Application rate at ≥40 yards ³ /acre or ≥10 tons/acre.	
Orchard or Vineyard	Nutrient Management (NRCS CPS 590)	Improved N Fertilizer Management on Orchard/Vineyard - Reduce Fertilizer Application Rate by 15%	Basic nutrient management	3	An eligible field(s) is where synthetic nutrient fertilizers have been applied annually	 A nutrient management plan for each field/crop based on soil test analysis and University of California or CDFA recommended rates. A farming log records all fertilization activities (fertilizer name, nitrogen content, application rate & date) during each project year.
Orchard or Vineyard	Residue and Tillage Management, No-Till (NRCS CPS 329)	Convert Tillage to No Till in Orchard/ Vineyard Alleys	No-Till or Strip-Till	3	Tillage implemented prior to application deadline	 No tillage; (2) all planting methods are no-till drill or broadcast if applicable. (3) Residues are kept on soil surface and not burned or removed; (4) A farming log recording all field activities.
Orchard or Vineyard	Residue and Tillage Management, Reduced Till (NRCS CPS 345)	Convert Tillage to Reduced Till in Orchard/Vineyard Alleys	Reduced- Till	3	Conventional tillage implemented prior to application deadline	 (1) Tillage methods (Mulch/vertical tillage, chiseling, or disking) that limit soil disturbance, or (2) Fewer tillage operations. (3) Plant residue covering soil surface during winter- spring period; (4) A farming log recording all field activities related to soil disturbance dates of activities and equipment used.
Orchard	Whole Orchard Recycling (NRCS CPS 808)	Whole Orchard Recycling	Whole Orchard Recycling	1	Age of trees at application	(1) Only orchards with trees at least ten years of age at application are eligible; (2) Orchard trees should be chipped and incorporated on the field where they were grown, not to export to new fields.; (3) Chips must be evenly distributed throughout the orchard and incorporated into the soil to at least 6 inches depth.

Agricultural System	HSP Practice	Practice Implementation	Payment Scenario	Number of Years to be Paid	Required Document / Information at Application	Implementation Guidelines
Orchard or	Windbreak/ Shelterbelt	Plant 1 Row of Woody Plants on	1-row, trees, containers, hand planted, with tree protected	1	Tree and/or shrub	 Container seedlings at 15-20 cubic inches or bare root seedlings at 2-3 years old before transplanting (2) Plant protection and irrigation are required; (3) ≥200 live plants/acre.
Vineyard	Establishment (NRCS CPS 380)	Border of Orchard/Vineyard	1-row, trees and/or shrub, with wind protection fence	1	species	(1) Container seedlings at 15-20 cubic inches or bare root seedlings at 2-3 years old before transplanting (2) A wind- protection fence and irrigation are required; (3) ≥200 live plants/acre.
Grazing Land	Compost Application (NRCS CPS 808), purchased compost	Compost (C:N >11) Application to Grazed Grassland, or Grazed, Irrigated Pasture	6 - 8 tons/Acre	3	Compost C:N ratio, Application Rate	Application rate must be between 6-8 tons/Acres
Grazing Land	Compost Application (NRCS CPS 808), on-farm produced compost	Compost (C:N >11) Application to Grazed Grassland or Grazed, Irrigated Pasture	6 - 8 tons/Acre	3	Compost C:N ratio, Application Rate	 Application rate must be between 6-8 tons/Acres. (2) Compost materials, method and Composting process must be documented. (2) Feedstocks may include green materials, food materials, wood waste, yard trimmings, agricultural materials or biosolids as defined in 14 CCR Section 17852 (https://www.law.cornell.edu/regulations/california/14-CCR- 17852).
Grazing Land	Hedgerow Planting (NRCS CPS 422)	Replace a Strip of Grassland with 1 Row of Woody Plants	Single Row	1	Hedgerow species	 (1) Pollinator-friendly trees, shrubs, and perennial wildflowers; (2) Plant density at ≥200 live plants/acre; (3) Average height at ≥3 feet and extend 15 feet wide at maturity; (4) Plant protection & irrigation.
Grazina	Prescribed	Grazing Management to Improve CS Rangeland, Irrigated or Non- Irrigated Pasture Condition	Pasture, basic	3	A grazing management plan by a certified range manager or	(1) Follow the grazing management plan, (2) A grazing log records of grazing dates and stubble height after
Land	CPS 528)		Range, basic	3	equivalent professional to enhance pasture or rangeland health, ecosystem function	grazing; (3) Monitoring - photos of forage before and after grazing; (4) Sensitive area protection as applicable. th, ion
		Seeding forages	Native species broadcast	1	Plant species (mixture of native	 Native adapted perennial species; (2) Seeding rate at 18 lb./acre PLS or 40 pure live seeds/sqft.
Grazing Land	Range Planting (NRCS CPS 550)	anting to improve P\$ 550) rangeland	Native species high forb drilled	1	perennial grasses, legumes, and/or	(1) Native perennial species; and (2) No-till or range drill seeding at 41-60 pure live seeds/sq ft.
		condition	Native species low forb drilled	1	torbs), planting method	 Native adapted perennial species; (2) no-till or range drill seeding at 18 lb/AC PLS or 40 PLS seeds/sqft.

Agricultural System	HSP Practice	Practice Implementation	Payment Scenario	Number of Years to be Paid	Required Document / Information at Application	Implementation Guidelines
			Nonnative species broadcast	1	Plant species (Introduced perennial grasses,	 mixture of nonnative adapted perennial species; (2) Seedbed preparation; (3) Seeding rate at 18 lb/acre PLS or 40 PLS seeds/sqft.
Grazing Land	Range Planting (NRCS CPS 550)	Seeding forages to improve rangeland	Nonnative species drilled	1	legumes, and/or forbs), planting method	(1) Mixture of nonnative adapted perennial species; (2) No-till or range drill seeding at 41-60 pure live seeds/sq ft.
		condition	Shrub plugs	1	Shrub species and planting method	 Shrub species such as Sage Brush, Bitter Brush, or other species; (2) seedling or transplant; bareroot shrubs at 3-5 feet tall or containerized seedlings ≥20 cubic inches; (3) Planting density at 1000 plants/acre.
			Bare-root, hand planted	1		(1) Seedling size: 18-36 inches tall or 10-20 cubic inches container for shrubs and hardwood; 1-year old seedlings or 4-6 cubic inches container for conifer; (2) Plant protection; (3) Plant density ≥35 live plants/acre.
Creation	Riparian Forest	Replace a Strip of Grassland Near Watercourses or Water Bodies with Woody Plants	Cuttings, Small to Medium Size	1	iree ana/or shrub species, Area of practice implementation must be upgradient from and adjacent to a stream	 (1) Cutting size: 0.25-1 inch in diameter and 2-4 feet long; (2) Plant protection; (3) Plant density ≥35 live plants/acre.
Grazing Land	Buffer (NRCS CPS 391)		Cuttings, Medium to Large Size	1		 (1) Cutting size: medium (0.25-1 inch in diameter and 2-4 feet long) to large (2-6 inch in diameter and 6 ft long); (2) Plant protection; (3) ≥35 live plants/acre.
			Small container, hand planted	1		 Potted seedling size: 1 quart to 1 gallon; (2) Plant protection; (3) ≥35 live plants/acre.
			Large container, hand planted	1		 Potted seedling size: 2 gallons or larger; (2) Plant protection; (3) ≥35 live plants per acre.
Grazing Land	Silvopasture (NRCS CPS 381)	Tree/Shrub Planting on Grazed Grasslands	Establish trees, existing grasses	1	Trees and/or shrubs	(1) Seedling size: containerized conifer at 4-6 cubic inches; or bare root conifer at one year old; (2) Plant density at ≥20 live plants per acre; (2) Tree protection (fence and irrigation, etc.)
Grazina	Grazing Land (NRCS CPS 612)	Conversion of Grassland to a Farm Woodlot	Conservation, hand planted	1	Trees and/or shrubs	(1) Shrub seedings at 6-18 inches tall or ≤10 cubic inches container; Tree or hardwood seedlings at 18-36 inches tall or 10-20 cubic inches container. (2) Plant growth maintenance. (3) Plant density: ≥150 live trees/acre.
Land			Conservation, hand planted, browse protection	1		(1) Shrub seedings at 6-18 inches tall or ≤10 cubic inches container; Tree or hardwood seedlings at 18-36 inches tall or 10-20 cubic inches container. (2) Plant protection from animal damage, wood stake to fasten plants in place and maintenance. (3) Plant density: ≥150 live trees/acre.
Grazing Land	Windbreak/ Shelterbelt Establishment (NRCS CPS 380)	Replace a strip of grassland with 1 Row of Woody Plants	1-row, trees, containers, hand planted, with tree protected	1	Tree and/or shrubs	 Seedlings at 15-20 cubic inches or bare root seedlings at 2-3 years old before transplanting (2) Plant protection and irrigation are required; (3) ≥200 live plants/acre.

Agricultural System	HSP Practice	Practice Implementation	Payment Scenario	Number of Years to be Paid	Required Document / Information at Application	Implementation Guidelines
Grazing Land	Windbreak/ Shelterbelt Establishment (NRCS CPS 380)	Replace a strip of grassland with 1 Row of Woody Plants	1-row, trees and/or shrub, with wind protection fence	1		 Container seedlings at 15-20 cubic inches or bare root seedlings at 2-3 years old before transplanting (2) A wind- protection fence and irrigation are required; (3) ≥200 live plants/acre.

Definitions:

Cropland, Annual or Perennial: Land where the crop(s) grown is identified as annual or perennial crops according to the <u>Conservation Compliance Agricultural</u> <u>Commodity List</u> under the Food and Security Act of 1985, as amended, or is determined as annual or perennial by the local USDA NRCS if it is not included in the list. Perennial cropland includes orchards and vineyards.

Grazing land: Land used primarily for production of forage plants maintained or manipulated primarily through grazing management.

Grassland: Land where the vegetation is dominated by grasses and other herbaceous (non-woody) plants, such as forbs.

Rangeland: Land on which the potential plant cover is composed principally of native grasses, grass-like plants, forbs or shrubs suitable for grazing and browsing, and introduced forage species that are managed like rangeland.

Pasture is a land use type having vegetation cover comprised primarily of introduced or enhanced native forage species that is used for livestock grazing. Pasture receives periodic renovation and cultural treatments such as tillage, fertilization, mowing, weed control, and may be irrigated. Pasture vegetation can consist of grasses, legumes, other forbs, shrubs or a mixture. Pasture differs from range in that it primarily produces vegetation that has initially been planted to provide preferred forage for grazing livestock.

Foregone Income: Reduced revenue that is generated mainly from reduced production because the land area used for growing cash crop(s) will be converted to Permanent Unfertilized Grass Cover or Grass/Legume Cover. A payment scenario name that includes Foregone Income has higher payment rate because it takes consideration of both the reduced revenue and the expense for implementing the conservation management practice.

Geotagged photograph: A geotagged photograph is a photograph which is associated with a geographic position by assigning a latitude and longitude to the image. For pictures taken with a mobile phone or digital camera, this can be achieved by enabling the GPS function of the device prior to capturing a picture. Geotagging helps CDFA confirm the correct location of practice implementation consistent with Project Design at the time of verification. Please check the link

https://www.cdfa.ca.gov/oefi/healthysoils/docs/InstructionsOnHowToTakeGeotaggedPhotos.pdf for instructions on how to take and send geotagged photos. While not formally recommended by HSP, recipients can also download and use geotagging applications on their mobile devices to assist in taking these types of photos.

Appendix B: Detailed Scoring Criteria

CRITERIA	MAX POINTS
1. PROJECT MERIT- PART I: Project Narrative (Application Part 04)	
 1.1 Project Justification Are mechanisms of proposed practice(s) to achieve GHG reduction, C sequestration and other co-benefits clearly described? Is the rationale of selected cash crop(s) and other plant species to be used described adequately? Is anticipated adoption by participating growers discussed? Are the Type A research and demonstration practices proposed in the project (if any) appropriately suited to the agricultural system on which project is located? Are all relevant attachments/supporting documents provided? 1.2 Experimental Design and Practice Implementation Are treatments and controls clearly identified in the schematic? Is the control/treatment designed to achieve statistically and scientifically sound comparisons to the treatment(s)? Is the design randomized with at least three replicates (Type A only)? Will proposed management practice(s) be consistent with the requirements in the corresponding NRCS CPS documentation white Paper and/or CDFA Whole Orchard Recycling Report? Is implementation method(s) for practice(s) in a Demo Type A project clearly described, feasible and scientifically sound? Are all relevant attachments/supporting documents provided? 	Туре А: 25 Туре В: 15
 reasonable and feasible (Type A)? Are methods of data analysis reasonable and scientifically and statistically sound? Is a schedule for data reporting provided? Are all required supporting documents provided? 	
2. PROJECT MERIT - PART II: Project Outreach (Application Part 05)	
 Are outreach objectives clearly described, adequate, appropriate, and measurable? Are proposed outreach activities reasonable, feasible and able to meet program requirements? These include (1) required on-farm Field Days and (2) Optional: workshops or other activities. 	Туре А: 15
 Are approach, procedures, or methodologies for outreach clearly described, suitable, and feasible? Will outreach products sustain outreach functions beyond the life of the project? Are all relevant attachments/supporting documents provided? 	Туре В: 25
3. Project Work Plan Merit and Feasibility (Application Part 06)	
3.1 Project Work Plan	15
 Are activities necessary to accomplish all project tasks included, suitable and feasible? These should include tasks to be completed in each project year during the 3-year grant term. 	

 Practice implementation (except one-time implemented practices) 	
o Data collection	
o Outreach tasks	
3.2 Evaluation of project success	-
Are methods to assess progress and success of practice implementation provided and feasible?	
• Will cost/benefits for adoption of the proposed practice(s) and/or anticipated barriers be measured and discussed?	
• Will methods and indicators that measure outreach progress and success in short (<2 years) and long-term (≥3 years)	
provided and feasible?	
Are all relevant attachments/supporting documents provided?	
4. PROJECT TEAM QUALIFICATION (Application Part 07)	
4.1 Project Oversight	1
Are roles of key personnel clearly identified?	
• Are cooperators/collaborators' roles, time commitment, and statements of agreement to participate clearly identified?	
• Is a plan articulated for project management, including time allocated for attainment of objectives and delivery of	
products, maintenance of partnerships and collaborations?	10
 Are all relevant attachments/supporting documents provided? 	10
4.2 Team Qualifications	1
• Do key personnel have sufficient expertise to complete the project, for example, in case of Type A projects, the principal	
investigator and/or project director must be experienced in scientific training and research.	
 Are support personnel, facilities, and instrumentation sufficient? 	
 Are all relevant attachments/supporting documents provided? 	
5. PROJECT BUDGET (Application Part 08)	
 Is the budget justification concise and clearly stated? 	
 Do all budget items and activities solely support implementation of the project? 	
• Does the budget clearly allocate sufficient resources to carry out project activities that will lead to desired outcomes?	
 Are the budgetary items realistic and costs justified? 	20
Are costs for personnel and labor reasonable?	
 Are any of the line item costs, including labor and contractual costs, duplicative? 	
 Is cost sharing (amount, source, and activities to cover) clearly identified and certified? 	
Are all relevant attachments/supporting documents provided?	
6. GHG EMISSION REDUCTIONS AND CO-BENEFITS (Application Part 09)	
Type A Projects	15
o will on-laim data collection provide meaningful measurements that would help develop model estimation?	15
 Type B Projects 	

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 Attachment(s): COMET-Planner report(s) - required 	
 Input data (county, practice and acreage) is consistent with information in the project design. 	
 Acreage to calculate GHG reductions is only for each treatment(s) in the project. 	
• Are there any co-benefits or ecosystem services achieved through this project? (Type A and B) (Part 04 Project Narrative)	
Are there any anticipated GHG emission reductions through adoption of demonstrated practices by growers/ranchers	
during the project term? (Type A and B) (Part 05 Project Outreach)	
TOTAL	100
7. PAST PERFORMANCE	
This criterion is only applicable to applicants who received an HSP Demonstration Project grant with the grant term end date on or	
after August 28, 2020. Points indicated in this section will be deducted from the total points (out of 100) scored by the HSP Technical	
Advisory Committee.	
7.1 Past grant agreement completion	
Canceled after grant expenses incurred.	-5
Terminated by CDFA due to non-performance/unresponsive recipient.	-10
7.2 Practice Implementation	
Not implemented in one or more project year(s) consistent with the grant agreement.	-10
 Implemented with delay, except for natural causes or CDFA's prior approval. 	-5
7.3 Data collection	
Failed to collect any of the following required data in one or more project year(s):	-10
 Type A: GHG emissions 	-10
 Type A: Yield 	-10
 Type A and B: Soil organic matter or soil water parameters 	-5
Failed to collect any other data in the project Scope of Work.	-5
7.4 Outreach	
Failed to conduct 3 field days during grant agreement term.	-10
Failed to meet 120 tarmer/rancher outreach goal:	-10
0 < 60	-5
0 01-119 7 5 Poporting	<u> </u>
7.5 Reporting	10
 Delay in submission of one or more required report(s) 	-10
7 Communication with CDEA	-5
7.6 Communication with CDFA	-10
Made changes to project scope of work without prior approval by CDFA.	
7.7 Post project outcome data	-5
Failed to respond to CDFA post-project data collection inquiry.	-
7.8 Cumulative performance issues	Not to be
An applicant receives negative 30 or more points using the above criteria.	funded.

Parameter	Data collection frequency	Approximate time of year for data collection	Recommended methods/devices and References
Soil water infiltration	Once or twice per year, or 12 hours after an irrigation or rainfall event	Preferably during a time of minimal soil disturbance or before any treatment implementation (e.g., tillage). Same time each year.	 Double-ring infiltrometer: <u>Example 1</u>, <u>Example 2</u> Cornell sprinkle infiltrometer: <u>Cornell Infiltrometer</u> Tension infiltrometer: <u>Mini-Disk from Meter Group</u> Single-ring infiltrometer: <u>NRCS Soil Quality Test Kit Guide</u>. Saltiel et. al. 2022. Comparison of Infiltration Test Methods for Soil Health Assessment. Journal of Soil and Water Conservation. 77 (6) 623-629 (doi:10.2489/jswc.2022.00178) NRCS 1999. <u>NRCS Soil Quality Test Kit Guide</u>
Aggregate stability	Annual or Seasonal	Preferably during a time of minimal soil disturbance, or before any treatment implementation (e.g., tillage). Late winter or early spring are recommended. Sample at the same time each year.	 Aggregate stability (dry) - soil must be air dried to test <u>Slakes: Soil aggregate stability - Apps on Google Play</u> Aggregate stability (wet): <u>Cornell Wet Aggregate Stability Test</u> NRCS 2019. <u>Recommended Soil Health Indicators and Associated</u> <u>Laboratory Procedures</u>. Soil Health Technical Note No. 405-03: 15-17 Flynn et. al. 2019. <u>Evaluation of SLAKES, a smartphone application for</u> <u>quantifying aggregate stability in high-clay soils</u> Soil Science Society of America Journal. 84:345–353. Schindelbeck, et. al., 2016. <u>Cornell University comprehensive</u> <u>assessment of soil health laboratory standard operating procedures</u>. Herrick et. al. 2001. <u>Field aggregate stability kit for soil quality and</u> <u>rangeland health evaluations</u>. Catena. 44: 17-35.
Soil water content	Anytime as needed	Any time	 Gravimetric/Volumetric method Soil Moisture senor and data logger DeAngelis, 2007. <u>Measurement of soil moisture content by gravimetric</u> <u>method</u> (University of California, Berkeley) Norris, 2019. Using Simple Graphs to Improve IWM Effectiveness with NRCS Financial Assistance. <u>2019 Plant and Soil Conference.</u> Moorberg et.al. 2021. <u>Soil and Water Relationships</u> in Soil Laboratory Manual. Manhattan, New Prairie Press, 2021.

Appendix C: References for Measurements of Soil Water Parameters

Appendix D: References for Measurements of On-Farm GHGs Emissions and Calculations

1. Data Collection Frequency and When to Collect

- Sampling frequency for GHGs emission measurements should be selected such that it allows collections of both baseline and peak GHG fluxes data associated with practice implementation, weather conditions, and field operations. Data collected should be sufficient to use for calculation of annual GHG emissions for each Treatment/Control plots.
- Specifically, collect soil-to-atmosphere GHG fluxes daily immediately before and following field operation events such as N fertilization, compost application, cover crop determination, tillage, first irrigation, and rainfall events. Daily measurements should be made immediately before the above events (to obtain values of baseline emissions) and continued until the fluxes subside again to background levels. A recommended sampling frequency is at day 1, 2, 3, 5, 9 and 14. How long the elevated fluxes last post the event will depend on conditions, such as soil water content and organic matter and nitrogen inputs. Once GHG fluxes recede and soils are relatively dry, measurements can be reduced to weekly or biweekly.

References:

- Sampling frequency: Cavigelli, M., Davis, B., Mirsky, S., and Needleman, B.. 2015. Novel Approaches to Interpolating N₂O Flux Between Episodic Sampling Points and Improving Sampling Vial Storage Times. YouTube Video: <u>https://www.youtube.com/watch?v=_XXWZYal0O8&t=1399s</u>
- Barton, L., Wolf, B., Rolwings, D., Scheer, C., Kiese, R., Grace, P., Stefanova, K., and Butterbach-Bahl, K. 2015. Sampling frequency affects estimates of annual nitrous oxide fluxes. Nature: Scientific Reports. 5:15912. DOI: 10.1038/srep15912 <u>https://www.nature.com/articles/srep15912.pdf</u>
- Flessa, H., Ruser, R., Schilling, R., Loftfield, N., Munch, J.C., Kaiser, E.A., Beese, F. 2002. N₂O and CH₄ fluxes in potato fields: automated measurement, management effects and temporal variation. Geoderma. 105: 3-4. Pg 307-325.

https://www.sciencedirect.com/science/article/abs/pii/S0016706101001100

- Almond orchards:
 - Decock, C., Garland, G., Suddick, E.C., Six, J. Season and location– specific nitrous oxide emissions in an almond orchard in California. Nutr.

Cycl. Agroecosyst., 107 (2017), pp. 139-155. https://link.springer.com/article/10.1007/s10705-017-9824-3

- Vineyards:
 - Wong, C.T.F., Falcone, M., Rich, G., Stubler, C., Malama, B., Lazcano, C., Decock, C. 2023. Short-term effects of increasing compost application rates on soil C and greenhouse gas (N₂O and CO₂) emissions in a California central coast vineyard. Frontiers in Environmental Science. <u>https://doi.org/10.3389/fenvs.2023.1123510</u>
 - Lazcano, C., Gonzalez-Maldonado, N., Yao, E.H., Wong, C.T.F., Falcone, M., Peterson, J.D., Casassa, L.F., Malama, B., Decock, C. 2022. Assessing the Short-Term Effects of No-Till on Crop Yield, Greenhouse Gas Emissions, and Soil C and N Pools in a Cover-Cropped, Biodynamic Mediterranean Vineyard. Australian Journal of Grape and Wine Research. <u>https://doi.org/10.1155/2022/8100818</u>
 - Lazcano, C., Gonzalez-Maldonado, N., Yao, E.H., Wong, C.T.F., Merrilees, J.J., Falcone, M., Peterson, J.D., Casassa, L.F., Decock, C. 2022. Sheep grazing as a strategy to manage cover crops in Mediterranean vineyards: Short-term effects on soil C, N and greenhouse gas (N₂O, CH₄, CO₂) emissions. Agriculture, Ecosystems & Environment. <u>https://doi.org/10.1016/j.agee.2021.107825</u>
- Zhu-Barker, X., Burger, M., Horwath, W.R., Green, P.G., 2016. Direct green waste land application: How to reduce its impacts on greenhouse gas and volatile organic compound emissions? Waste Management 52: 318-325.
- Zhu-Barker, X., Horwath, W.R., Burger, M., 2015. Knife-injected anhydrous ammonia increases yield-scaled N₂O emissions compared to broadcast or band-applied ammonium sulfate in wheat. Agriculture, Ecosystems & Environment 212, 148-157.

2. General Methods for Sample Collection

 Gas fluxes can be measured using a static chamber technique (<u>Hutchinson and Livingston, 1993; Parkin and Venterea, 2010</u>). Chambers must be vented and insulated. An example of economic, easy-to-use flux chambers is described in DeCock et al. (2017): Insulated, vented round PVC chambers (e.g., 25.4 cm diameter) were used by the researchers. PVC rings of the same diameter served as chamber bases and were inserted 8 cm deep into the soil and, according to periodic measurements of the protruding sections, extended 4–5 cm above the soil surface. Once the chambers were set on the bases, the effective chamber height ranged from 11 to 13 cm, with a mean chamber height of 12 cm. In the study by DeCock et al. (2017), one chamber base was placed at the center of each plot. In furrow-irrigated systems, chamber bases might be placed on the beds and in the furrows. The chamber bases are left in place unless field operations require their temporary removal. At least 24 hours should elapse after chamber base installation before gas samples are collected

During gas sampling, the chambers are fitted onto the bases and sealed with a rubber gasket overlapping the base and chamber. Headspace gas samples are collected from each chamber through a sampling port with a rubber septum using a polypropylene syringe (Monoject) by slowly withdrawing 20 mL gas at 0, 20 and 40 min after deploying the chamber tops onto the bases. The gas samples are immediately transferred into evacuated 12-mL glass vials with grey butyl rubber septa (Garlend, et. al., 2014). Time zero samples can also be calculated from three ambient samples taken near the soil surface at the beginning of sampling, to minimize error from pressure perturbations caused by the chamber closure (Verhoeven et al. 2014).

References:

- Static chamber: Parkin, T. and Venterea, R. 2010. USDA-ARS GRACEnet Project Protocols. <u>https://www.ars.usda.gov/ARSUserFiles/np212/Chapter%203.%20GRACEne</u> t%20Trace%20Gas%20Sampling%20Protocols.pdf
- Decock, C., Garland, G., Suddick E.C., Six, J. 2017. Season and locationspecific nitrous oxide emissions in an almond orchard in California. Nutriient Cycling in Agroecosystem. 107: 139-155.
- Garland, G.M., Suddick, E., Burger, M., Horwath, W.R., Six, J. 2014. Direct N2O emissions from a Mediterranean vineyard: Event-related baseline measurements. Agriculture, Ecosystems and Environment, 195: 44-52.
- Hutchinson, G.H. and Mosier, A.R. 1981. Improved Soil Cover Method for Field Measurement of Nitrous Oxide. Soil Science Society of America Journal. Fluxes. <u>https://doi.org/10.2136/sssaj1981.03615995004500020017x</u>

3. Sample Storage and Analysis

• Gas samples can be stored at room temperature for up to 2 weeks before analysis on a gas chromatograph (GC) (Garlend, et.al., 2011). If storage is anticipated to exceed 2 weeks, a set of gas standards should be

prepared on the same day as the gas samples are collected to validate the integrity of the stored samples.

4. Data Analysis and Reporting

 Greenhouse gas fluxes are calculated from the rate of change in chamber concentration, chamber volume, and soil surface area (Hutchinson and Mosier, 1981). Chamber GHG concentrations determined by the GC (volumetric parts per million) must be converted to mass per volume units assuming ideal gas relations using chamber air temperature values measured by a thermocouple thermometer during the time when the gas samples are collected in the field.

An example of N₂O gas flux calculation, expressed as mass of N per square centimeter per minute is shown below.

mg N₂O-N cm⁻² min⁻¹ = The volumetric difference between two subsequent gas samples (x cm³ N₂O/10⁶ cm³ air)*(mol N₂O/24205 cm³ N₂O)*(295°K/°K chamber temperature)*(28000 mg N/mol N₂O)*(cm³ chamber volume)/{(cm² surface area)*(min interval)}, where,

surface area = the area covered by the chamber,

interval = time between gas sample removals from the chamber, 24205 cm³ = volume occupied by a mole ideal gas at 22°C (295°K) at 1 atm (sea level).

22°C = assumed temperature of gas before analysis (i.e. room temperature).

• Daily fluxes may be calculated using the best flux method (Garland et al. (2011), i.e. either an algorithm appropriate for curvilinear concentration data with time when N₂O concentration in the chamber increased at a decreasing rate or linear regression, as explained in Hutchinson and Mosier (1981). More recently, GHG flux calculation methods were described by Parkin and Venterea (2010). the GHG fluxes are calculated by linear regression or a least squares regression procedure fitting a quadratic equation to the concentration versus time data for curvilinear concentration data with time. The researchers developed the following criteria for flux calculations: Linear regression is used if the coefficient of determination (r²) is>0.90. For the remainder of the fluxes, the slope of the quadratic equation is used if r² > 0.80, or, if the latter criterion is not met, the slope of a linear regression model that included three time points

where $r^2 > 0.80$ is used. The procedure is also described by Verhoeven & Six (2014).

 The cumulative annual N₂O and CH₄ emissions can be calculated by trapezoidal integration of daily fluxes under the assumption that the measured fluxes represented mean daily fluxes, and that mean daily fluxes change linearly between measurements (Venterea et al., 2005).

References:

- Gas flux calculations: Verhoeven, E., & Six, J. (2014). Biochar does not mitigate field-scale N2O emissions in a Northern California vineyard: An assessment across two years. Agriculture, Ecosystems & Environment, 191, 27–38. <u>https://doi.org/10.1016/j.agee.2014.03.008</u>
- Garland, G..M., E Suddick, M Burger, W R Horwath, J Six. 2011. Direct N₂O emissions following transition from conventional till to no-till in a cover cropped Mediterranean vineyard (Vitis vinifera). Agriculture, Ecosystems and Environment, 141: 234-239.
- Collier, S.M., Ruark, M.D., Oates, L.G., Jokela, W.E., Deli, C.J. 2014. Measurement of Greenhouse Gas Flux from Agricultural Soils Using Static Chambers. Journal of Visualized Experiments. (90) 1-8. <u>https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4827936/pdf/jove-90-52110.pdf</u>
- Chen, G., Kolb, L., Cavigelli, M. A., Weil, R. R., and Hooks, C.R.R. 2017. Can conservation tillage reduce N2O emissions on cropland transitioning to organic vegetable production? Sci. Tot. Env. 618: 927-940. <u>https://www.sciencedirect.com/science/article/abs/pii/S0048969717323</u> 185
- Hutchinson, G.L., Mosier, A.R., 1981. Improved soil cover method for field measurement of nitrous oxide fluxes. Soil Sci. Soc. Am. J. 45, 311–316.
- Parkin, T.B., Venterea, R.T., 2010. Chamber-based trace gas flux measurements. In: Follett, R.F. (Ed.), Sampling Protocols (Chapter 3). <u>https://www.ars.usda.gov/ARSUserFiles/31831/2011%20Parkin%20and%20V</u> <u>enterea%20Trace%20Gas%20Protocol%20Revision%20Final.pdf</u>
- Venterea, R.T., Burger, M., Spokas, K.A. 2005. Nitrogen Oxide and methane emissions under varying tillage and fertilizer management. J. Environ. Qual. 34: 1467-1477.

Appendix E: Confidential Information

The California Public Records Act (Government Code sections 6250, et seq.) and related statutory definitions of "confidential or proprietary information" (also known as "trade secrets") determine what information provided by the applicant is exempt from public disclosure. The following describes how questions are resolved regarding what information is confidential, the legal protections for confidential information, and internal and program procedures to maintain confidentiality.

What is "confidential?"

The California Public Records Act prevents the disclosure of confidential or proprietary information including, but not limited to:

- Confidential Business and financial information, including volume of business, costs and prices, customers, financial condition, trade secrets, and similar information obtained under an express or implied pledge of confidence. (Ev. Code § 1060 and Gov. Code § 6254).
- Personal data including tax information prohibited from disclosure. (Gov. Code § 6254 and Rev. & Taxation Code § 19542.
- Information Practices Act of 1977 (Civ. Code section 1798 et seq.)

Applicants are directed to clearly marked, on each page,

"confidential/proprietary information" those documents they feel contain confidential or proprietary information. However, the mere marking of documents as "confidential/proprietary information" will not result in their being treated as confidential if they are not exempt from disclosure under the California Public Records Act.

What if there is a question about what is confidential? The CDFA Legal Office will review the records and make a determination as to whether or not the records are exempt from disclosure.

What program procedures will keep information confidential? Financial information will be analyzed, on a need-to-know basis, by staff from the CDFA, kept confidential, and will be maintained with restricted access. Grantee businesses will agree to provide specific key financial information for three years to develop benchmarks to evaluate the program. The records will be kept for the amount of time set forth in CDFA's Internal Record Retention Policy.