CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

2020 HSP Demonstration Projects - Applications Submitted to CDFA *

Applicant Organization	Project Description	Funds Requested	Cost Share	County	GHG Reduction Estimation ($MTCO_2$ eq/year) **
University of California Davis	Anecdotal reports indicate microbial inoculation using aerated compost tea (ACT) can successfully increase yields by promoting beneficial functioning of the soil food web. However, use of ACT remains low because growers are uncertain if the practice is worth the costs to optimize yields. Beneficial effects of ACT may increase when combined with compost application, perhaps though priming as nutrients are released from organic matter, which has important implications for carbon storage and yields. This project will collaborate with the largest grower of olives for oil production in North America to investigate the potential of ACT and compost to 1) increase carbon pools 2) reduce GHG emissions, 3) increase yields and 4) improve biological soil health indicators. Treatments will include compost, ACT, ACT combined with compost, and a grower standard control. Demonstrating the effects of these practices on a large agricultural scale will allow growers to determine their value in terms of costs and yield returns. The project will increase knowledge of the carbon sequestration and GHG reduction potential of microbial inoculation using ACT, address knowledge gaps on the ecosystem impacts of this practice and assist in streamlining methodology for its brewing and application.	$249,673.92	$57,067.80	Yolo	164.2
Regents of the University of California	Alfalfa production confers many benefits for soil health, including biological nitrogen fixation, facilitation of soil microbial activity, and organic matter inputs from large root systems. However, in clay soils like those in the northern region of the Central Valley, growers struggle with soil structure in alfalfa during the dry months; in particular, soil cracking, which can cause difficulties in flood irrigation water management and is deleterious for soil water retention. Producers of other no-till cropping systems, like almond orchards, have claimed that compost application markedly reduced soil cracking after just one year of application, implying the practice holds promise for alfalfa systems. Moreover, compost application to alfalfa has received little research attention, despite its potential benefits for maintaining phosphorus and potassium fertility in a high P- and K-using crop. We will investigate the effect of two green waste compost application rates and 1 poultry manure rate, on GHG emissions, carbon sequestration, soil structure, and impacts on alfalfa yield and forage quality. Compost application field trials will be conducted at farm scale on two farms in newly established alfalfa stands, and at the UC Davis Russell Ranch Sustainable Agriculture Facility.	$249,055.91	$0.00	Yolo; San Joaquin	164.7
Modoc Resource Conservation District	The Modoc Resource Conservation District, in partnership with Point Blue Conservation Science and Triple 3 Family Farm, will study the effects different delivery methods of compost application have on GHG emissions and soil health in a grazed, irrigated grassland ecosystem. One of the limitations to implementing the standard practice of compost application in Modoc County is the financial barrier to truck quality, certified compost into this remote county. Our project will study the total greenhouse gas life cycle to implement compost application in both a solid form, as well as a liquid tea form, to the grasslands of Modoc County. Our data will contribute to understanding on how each of these practices affects GHG emissions, soil health, soil microbial community, and plant and wildlife diversity on a holistically managed ranch. The goal of this project is to implement soil health practices while building an understanding of the cost-benefit ratio of implementing these practices on the Modoc Plateau grazing lands.	$203,447.21	$12,015.00	Modoc	55.4

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Cachuma Resource Conservation District	This project serves as an opportunity to highlight the many benefits of hedgerow establishment and appropriate agroforestry in our bioregion using climate-appropriate species some of which will also offer a supplemental forage resource for livestock, pollinators and/or beneficial insects in an area with low annual precipitation and prone to drought. Tree, shrub and other perennial plant establishment will help keep soils and ambient microclimate temperatures cooler, increase soil water holding capacity and decrease soil erosion and compaction, increasing absorption and storage of the rain that does fall. Hedgerows will provide essential habitat for various wildlife including pollinators and beneficial insects and act as a living fence. Onsite, the specific hedgerow locations are in zones where winds pick up and spread trash material such as plastic film from adjacent row crops. This can be detrimental to cattle when ingested so the hedgerows will also serve as a natural barrier to help slow the spread of this material.	$99,655.91	$0.00	Santa Barbara	11
California Marine Sanctuary Foundation	This project, Demonstration of compost and native seeding practices to improve soil health and native forage growth on degraded ranch landâ€□ will implement two healthy soils practices, compost application and range planting, on 4 acres of an 816 acre cattle ranch in Monterey County, California. Marks Ranch is managed by the Big Sur Land Trust (BSLT) for multiple purposes that include cattle grazing, human recreation, biodiversity, and preservation of scenic open space. Through the implementation of healthy soils practices we anticipate that this degraded area of Marks Ranch will experience an increase in soil water holding capacity, infiltration to groundwater, better drought resilience, increased native plant diversity, reduced bare ground, reduced erosion, reduced soil compaction, and improved forage for cattle grazing. A primary goal is to increase carbon storage in the soils and plants and demonstrate this potential to other ranchers and the land management agencies and organizations making land management decisions throughout California. The California Marine Sanctuary Foundation is submitting this project proposal because it represents an opportunity to provide education on how land based practices can improve ocean health through reducing atmospheric carbon and diminishing the rate of ocean acidification and warming.	$99,998.81	$18,595.33	Monterey	9.5
University of California Cooperative Extension	Field and row crops grown in the Central Valley include alfalfa, processing tomatoes, sunflower, safflower, corn, and beans on several million acres. Most of the production is conventional, with chemical inputs, including synthetic fertilizers and pesticides to ensure high crop yields and quality. A persistent issue for some field and row crop growers on some soils is offsite movement of pyrethroid insecticides in surface water. When fields are sprayed for pests, some of the pesticide drifts on the soil; when they are irrigated, pesticides can move offsite with sediment in irrigation and storm water runoff, contaminating surface waters. We propose to look at the value of compost for helping to improve soil structure for increased water infiltration, soil fertility, and potential for stimulated microbial activity to help biodegrade pyrethroid insecticides on soil surfaces. Additional potential benefits of compost include increased organic matter and carbon storage in the soil, and reduced carbon dioxide (CO2) greenhouse gas emissions. Our studies will evaluate the value of compost use to support greater sustainability of crop production leading to enhanced soil moisture infiltration, reduced erosion, reduced pesticide offsite movement, and greater plant nutrient availability from compost use in row crops in the Sacramento Valley.	$99,880.97	$0.00	Solano	266

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Blue Sky Sustainable Living Center	Blue Sky Center and partner, White Buffalo Land Trust, are committed partners for developing innovative regenerative demonstration sites in Santa Barbara County that are scalable and collaborative, with the potential to have a vertical economic impact in one of our most vulnerable regions in the Central Coast, the Cuyama Valley. The current demonstration project proposed to the California Department of Agriculture, Health Soils Program suggests that a dry meditereannean, semi-arid climate can support dry-farmed grain production as part of a multispecies pasture cropping system, and rangeland productivity can be increased utilized the practice of shelter belt systems. Utilizing the principles of maintaining soil cover, reduced soil disturbance, increased plant diversity, and the integration of animals with appropriate planned timing, impact and recovery to benefit ecological function in the systems of soil/plant dynamics, and hydrological and nutrient cycles.	$99,937.50	$21,564.00	Santa Barbara	22
Center for Land-Based Learning	The Maples Farm is situated in an area where the soil is highly sandy. This sandy soil is low in organic matter and its water retention capacity is poor. Farmers in the region mostly grow vegetables for seed production. Seed production requires intensive tillage operations in addition to heavy fertilizer applications and other inputs. This has contributed to the deterioration in soil health, and the volatilization of nitrogen and carbon thereby contributing to GHG emissions. Further, water retention capacity has steadily decreased leading to increased irrigation frequency and higher energy consumption. The Maples Farm Demonstration project, by using compost, multi-species legume cover crop and no-till will demonstrate how soil health can be improved and input costs reduced. This regime will also lead to a reduction in GHG by reducing volatilization, will sequester carbon while at the same time reducing input costs. The proposed agricultural management practices will be compared against a cover crop and heavy tillage practice control plot. Farmers in the region will be able to observe the benefits through on-site field days. The data gathered on soil organic matter, water infiltration, and costs will be used to demonstrate to the farmers the benefits of the proposed regime.	$95,389.61	$17,498.00	Yolo	24.6
Glenn County Resource Conservation District	In the 21st century, we are facing unprecedented challenges such as global climate change, topsoil erosion, biodiversity loss, and increasing water demands. Farmers are in a unique position to address some of the major environmental challenges facing California while simultaneously improving the fertility and sustainability of our agricultural lands through conservation management practices such as cover crops. The Demonstration site is a 160 acre olive orchard that will be implementing cover crops on about half of the acreage. This project will show growers in California how cover crops in an olive orchard can advance soil health, increase carbon sequestration, and positively impact farming operations. Soil health indicators include soil organic matter, total soil carbon, total soil nitrogen, water infiltration rates and bulk density. This project will ultimately demonstrate that it is possible to increase SOM and total soil carbon through use of cover crops; and, this projectâ€™s proven outreach methodologies of on-farm field days in Glenn County will encourage in depth discussions about the importance of SOM and total soil carbon to soil health, agricultural sustainability, and farm profitability to new and recurring audiences.	$85,510.04	$15,345.00	Glenn	124

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The Regents of the University of California	The objective of this project is to achieve an improvement in soil health, reduce GHG emissions and demonstrate a regenerative model for farming raisins. This will be accomplished by implementing several different management practices, applications of compost and mulch. The function of the compost is to provide nutrients and as a biological inoculate to promote soil health and increase the SOM. Mulch would be applied directly under the vine and would act as a soil shield providing ground cover that will maintain soil temperature and reduce weed pressure, leading to a significant reduction in the need to disturb the soil. Reduction of tillage is also a key component to our project. Currently, farming organic raisin grapes involves a significant amount of tillage in a variety of forms. Organic herbicide is very expensive and less effective than conventional products thus leading to heavy tillage under the vine. In addition to significant under vine tillage, most growers manage their alleyways in preparation for harvest throughout the entirety of the year. This leads to poor soil health, and GHG emissions. Cardoza farms intends to mow and not disturb the soil, leaving living roots covering as much ground for as long as possible.	$99,991.95	$0.00	Fresno	78.9
American Farmland Trust	American Farmland Trust (AFT), University of California, Merced (UCM), and Pacific Farming Company (PF) will apply cover crops (USDA NRCS CPS 340) on 1.5 acres and compost on an additional 1.5 acres of an almond orchard in Madera County. Cover crops will be applied on 4 Treatment fields (T), each adjacent to 4 corresponding Control fields (C). Compost will be applied on 4 separate Ts, each adjacent to their own corresponding 4 Cs. Partners will collect soil samples to analyze at a lab for texture, organic matter, carbon and nitrogen concentrations, bulk density, pH, moisture and temperature, water infiltration, and microbial biomass; take on-field measurements on agronomic data, including crop yield and understory plant community identification and concentration; take on-field measurements of greenhouse gases (GHG) carbon dioxide, methane, and nitrous oxide; and conduct an economic analysis of the adopted practices entailing annual crop yield data and associated changes in inputs, including savings in water, fertilizer, soil amendments, and labor inputs. Partners will host 3 demonstration field days and present project results at conferences, reaching a minimum of 120 farmers, to demonstrate the soil health, GHG reduction, and economic benefits of adopting cover crops and compost application.	$249,865.16	$14,363.13	Madera	8.8
Inland Empire Utilities Agency	To demonstrate the value of healthy soils by using compost, this project will use an 80-acre farm site in Anza amended with rich compost to offset the requirement for fertilizers. The farm site will be amended with compost prior to planting and an adjacent control plot will be farmed using conventional fertilizers. GHG impacts will be monitored to evaluate the difference. The compost producer, Inland Empire Regional Composting Authority, will provide the premium compost to the Anza farm where the compost will be spread at the rate of 5 tons per acre. This project will demonstrate the economic and environmental benefits to farmers with considerable soil health improvement, which will encourage them to use more compost as standard practice. Healthy soils require less water and fertilizer and capture carbon holding it in the soil resulting in GHG reductions and higher net revenues. Increasing the carbon content of soils has been scientifically shown to lead to greater agricultural sustainability and ensure food security, especially in light of climate change.	$241,760.00	$82,133.00	Riverside	320

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Organic Fertilizer Association of California	This project seeks to conduct a demonstration site at a school farm in Glenn County where a compost field trial will be conducted in a mature planting of high-intensity olives. Outreach will be provided throughout the state by a series of 15 grower workshops held around the state over the project duration promoting best practices and practical advice for on-farm application of compost for organic and conventional farmers. Further, webinars will be conducted and translated into Spanish to further expand the educational offering.	$90,885.88	$5,500.00	Glenn	3.8
University of California, Agriculture and Natural Resources	The implementation of climate-smart agricultural practices within intensively managed vegetable cropping systems is extraordinarily challenging. Often conservation practices cannot be effectively implemented due to operational barriers, resulting in very low rates of adoption. By demonstrating nutrient management strategies in partnership with a large influential vegetable grower in the Salinas Valley, we aim to encourage broad scale practice adoption. Recent research has indicated the addition of organic amendments in combination with N fertilizers potentially reduces N derived greenhouse gas emissions and nitrate leaching while increasing soil carbon stocks. These outcomes will generate significant climate benefits in agroecosystems experiencing heavy tillage and fertilizer inputs. Our project has the potential for state-wide impact as we are currently working with the developers of COMET-Farm to provide data and coordinate outreach within vegetable cropping systems. Through direct engagement we aim to make integrated sustainable N management more feasible and agronomically favorable for producers. Using hands-on COMET-Farm focused Field Days and a webcasted sustainable N short course our project will provide producers with additional tools to make nutrient management planning decisions that have positive climate and soil health outcomes.	$249,996.95	$47,523.00	Monterey	2.9
Department of Land, Air and Water Resources, University of California Davis	The potential for cover crops to improve soil health and productivity while lowering global warming potential makes them appealing to address climate change mitigation and promote sustainable land-use. Our goal is to demonstrate successful cover crop management for walnut growers to 1) sequester C and reduce greenhouse gas emissions, 2) build healthy soils to enhance system resilience to climate change, and 3) improve overall sustainability and productivity of walnuts. This project leverages an interdisciplinary assessment of cover crop mixes supported by CDFA. In this proposal, we propose to demonstrate the impact of different winter cover crop mixes on soil C sequestration, greenhouse gas emissions, soil fauna (i.e. earthworms and nematodes) population, crop yield, and the implications for resource use efficiency of walnut production. We will provide detailed measurement on soil C and greenhouse gas emissions associated with planted cover crops, conduct cost-benefit analysis, refine cover crop management guidelines, and host outreach events to extend information to growers.	$249,999.00	$164,678.00	Colusa	33.9
The Regents of the University of California	This project has three components: replicated research plots to evaluate three cover crop varieties for improvements in soil structure, specifically subsurface soil compaction; field-scale demonstration plots in Sacramento Valley to showcase performance of cover crop varieties on soil compaction alleviation; and small, single-row hand planted plots in the buffer area to test various summer and winter cover crop varieties for outreach and demonstration purposes. The outreach objective is to reduce barriers to cover crop adaption among regional growers by increasing knowledge and information about varietal selection and field-scale cover crop management, as well as opportunities to improve soil structure using cover crops.	$99,831.59	$47,699.00	Colusa	4

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The Regents of the University of California, Davis	Compost facilities that produce compost from green waste make two types of compost. Approximately 50% of the compost produced is of particle sizes of up to 3/8 inch, which is the finished compost that is widely used by agricultural customers. The remaining 50% of compost is large particle compost with particles larger than 3/8 inches that has in previous years been hauled to California co-generation plants. However now that the majority of California co-generation plants have closed or are scheduled for closure, the compost industry is searching for a new market for the large particle compost of more than 3/8-inch particle size. If a new market is not found for large particle compost it is likely to be directed into the landfills. This project will evaluate and demonstrate the relative impacts to soil organic carbon sequestration & GHG reduction potential from use of large versus small versus no compost application in a row crop rotation of garbanzo beans, tomato, sunflower and wheat on a Sacramento valley farm. Filling the knowledge gap together with the lower price of large particle compost could facilitate expansion of compost use to new growers and simultaneously redirect this compost fraction away from landfills.	$244,194.00	$0.00	Yolo	202.3
Quail Springs Permaculture	The project will implement on-farm compost application, mulching, and hedgerows on proposed Field T1, and a riparian forest buffer on proposed Field T2. The proposed demonstration site is ideally located for farmer outreach and adoption of new management practices, as the site is located in the midst of large scale conventional agricultural area that is grappling with the challenges of native soil with low nutrient content, poor soil water retention, and desertifying conditions. Both climate instability and poor agricultural practices are contributing to the increasing challenges, and this project seeks to serve as a local community demonstration of productive agricultural practices that support the future of farming in semi-arid regions.	$61,302.07	$63,000.00	Ventura	2.3
Chico State Enterprises	The proposed project will test soil health practices in a cotton production system located at the Paul L. Byrne Memorial University Farm. Managed by the Center for Regenerative Agriculture and Resilient Systems, the project requests $249,929 over 31 months. Eight randomized treatments will be replicated across 24 treatment plots. Conservation management practices include Cover Crops, Reduced Tillage, and Mycorrhizal Application. The design will allow us to determine the most beneficial combination of practices to reduce GHG, improve soil health and increase water retention, SOM, nutrient density, biodiversity, and soil stability. Outreach includes Field Days, Farmer-to-Farmer Workshops, and web-based dissemination and publication.	$249,929.00	$0.00	Butte	3.6
African American Farmers of California	The African American Farmers of California would like to introduce agricultural education targeting socially disadvantaged youth, and socially disadvantaged farmers and ranchers, in rural and persistent poverty communities and implement soil conservation practices. Their goal is to teach these populations how they can benefit from implementing more ecologically friendly soil conservation practices, while providing a demonstration site for field days. These practices include the addition of fruit trees being used for windbreaks, a winter cover crop and mulching for weed control and finally adding compost to boost soil fertility. Through showcasing these practices to their target audience, they hope to make a difference not only for their community of farmers that are part of their organization, but for their partners: Fresno Freedom School students and the West Fresno Family Resource Center.	$99,997.24	$0.00	Fresno	51.8

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Cal Poly Corporation, auxiliary of California Polytechnic State University, San Luis Obispo	Compost application to rangelands can sequester carbon, increase productivity and improve soil health. However, significant knowledge gaps exist between recommended compost application rates to rangelands (~4 tons/acre) and large rates of compost reported to sequester carbon in the literature (~35 tons/acre). This demonstration addresses this knowledge gap, through farmers, ranchers, and scientists working together. We will investigate multiple rates of a single large application of compost to sequester carbon, increase rangeland productivity, and improve soil health, while assessing potentially negative impacts to N_2O emission and phosphorus (P) loading. This will be conducted across two strongly contrasting soil types, a microcosm of the diverse soils of California. Our research takes place at Swanton Pacific Ranch, where existing regenerative cattle grazing demonstration program is integrated into our proposed well-replicated project investigating compost application to soils degraded by previous cultivation. Our project explores the potential tradeoffs with compost addition between pollutants and carbon sequestration with an interdisciplinary research team including a social-science rich outreach program. After three years, we will have generated important findings regarding compost application rates, soil health and carbon sequestration, and shared important lessons to hundreds of farmers and ranchers to address CA changing landscapes.	$249,407.00	$0.00	Santa Cruz	26.5
Agriculture and Land-Based Training Association	The project will provide cover crop demonstration; bilingual outreach events that include two field days, four soil health workshops, and two alumni events; and new reference materials. With a robust outreach campaign, one-hundred and forty farmers will participate in events, in addition to an estimated 40 additional agricultural professionals, college students, and technical service providers. CODE-SV's demonstration plot will have side-by-side trials of two cover crop treatments (cereal only and a cereal-legume mix) and a control (no cover crop). The cover crop treatments and control will be managed in rotation with celery and lettuce crops. Data across treatments and control will be gathered on soil organic matter, soil chemical composition, soil-borne pathogens, and yield. Results will include: technical assistance to 60 farmers that leads to 80 acres of cover crops being planted; one-hundred-eighty participants will gain knowledge on soil health topics; and new reference tools that can be used to reach many more farmers into the future.	$99,999.60	$19,722.00	Monterey	19.2
University of California Cooperative Extension	Annual rotational row crops grown in the Sacramento Valley include processing tomatoes, sunflowers, peppers, safflower, beans, and corn, produced on nearly a million acres per year. Most of the production is conventional, with significant chemical inputs, including synthetic fertilizers (particularly nitrogen) to ensure high crop yields and quality. A persistent issue for some row crop growers on some heavier ground in the Sacramento Valley is cracking soils, leading to crop losses from root injury as well as damage to subsurface drip lines that crack and split when soils fracture, resulting in costly repairs. We propose to look at the value of compost for helping to improve soil structure and soil fertility. Potential benefits of compost also include increased organic matter and carbon storage in the soil, reduced carbon dioxide (CO2) greenhouse gas emissions, more efficient irrigation water infiltration, and lower surface runoff of irrigation tail-water and rainfall from farm fields. Our studies will evaluate the value of compost applications to support greater sustainability of crop production due to enhanced soil moisture infiltration, lower erosion and cracking, and greater plant nutrient availability that will accompany stimulated soil microbial activity.	$248,186.42	$26,362.15	Yolo and Sutter	135

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Coastal San Luis Resource Conservation District	This experiment would be applied to a 10-acre hayfield on Chorro Ranch, next to Cuesta Community College. On this field, we would compare the use of compost and adoption of reduced tillage practices. Compost application can increase carbon storage, soil physical and biological health and is readily available from the Cal Poly composting facility. Reduced tillage raises organic carbon concentrations in the soil by 50%, causes aggregation, and buffers soils to climate change (Almagro et al. 2017).The experiment will be set up by Cal Poly staff under the management of Kevin Piper, director of Agricultural Operations and the technical direction of Dr. Charlotte Decock, Cal Poly Soil Science professor. We propose a full factorial experiment with 2 factors, tillage and compost amendment. The 2 levels in the factor tillage are conventional tillage vs. reduced tillage, while the 2 levels in the factor compost amendment are no compost vs. compost amendment. The experiment will be set up as a split plot design with 3 replicate blocks. Within each of three blocks, the four treatment combinations conventional till, no compost (CT-NC), conventional till, compost (CT-C), reduced till, no compost (RT, NC) and reduced till, compost (RT-C) will be represented.	$99,997.89	$15,000.00	San Luis Obispo	8.8
Yolo County Resource Conservation District	New compost and mycorrhizae applications will be made on cultivated fields at Hedgerow Farms near Winters, CA, a 350-acre farm in Yolo County specializing in producing seed of wildland-collected California native grasses, forbs, sedges, and rushes. Their seeds and plants are used in wildlife habitat restoration projects, agricultural revegetation projects, for erosion control and urban and rural landscaping throughout the state. This will be a Type A Demo project, in which scientists will collect data on field measurements of soil greenhouse gas (GHG - carbon dioxide) emissions, and on related benefits to soil health, water and air quality. Three replicate native grass-growing fields, each with treated (T) and no compost control (C) sections, will be sampled for continuous (hourly) soil moisture and temperature, several times per year for soil GHG fluxes, and annually for soil microbial biomass and soil organic matter and nitrogen content. Education and outreach will be led by the Yolo County Resource Conservation District with partner support from the UC Cooperative Extension, UC Agriculture and Natural Resources and the USDA Natural Resources Conservation Service.	$247,748.85	$26,639.00	Yolo	56.1
Chico State Enterprises	The demonstration project, located at Cobblestone Ranch in Los Molinos, CA, will test rangeland soil health practices to determine their effectiveness in meeting State GHG targets, along with co-benefits of rangeland productivity and community diversity through the restoration of perennial forage species. Managed by the Center for Regenerative Agriculture and Resilient Systems, the project requests $249,999. The project aims to demonstrate rangeland perennial planting for soil health in the Northern Sacramento Valley, in addition to testing the success of rangeland planting through the use of companion practices including compost application and mycorrhizal inoculation. The trial will consist of four treatments and control plots replicated across four field blocks. Conservation practices to be implemented will be Range Planting with companion practices of Compost Application, Mycorrhizal Application, and combined Compost Application and Mycorrhizal Application.	$249,999.00	$0.00	Butte	215.3

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National Audubon Society	Agricultural practices with multiple benefits are increasingly important to meet the many objectives of the state related to wildlife and the environment while also being resilient to climate change. This project aims to provide the multiple benefits of wildlife habitat, improved environmental and soil health quality, and greenhouse gas mitigation. Specifically, we will provide habitat for birds and other wildlife, improve soil health, sequester carbon, and contribute to improved local water quality via reduced run-off. We will install a cover crop annually for two years (NRCS CPS 340) on a post-harvest rice field with an adjacent control field left fallow and also install conservation cover (NRCS CPS 327) to improve an unfarmed field margin at River Garden Farms in Yolo County. In addition to SOM and soil nutrients measurements, we will estimate the multiple benefits of the practices through bird use. We will share the benefits of the cover crop and conservation cover and other farming practices to at least 120 farmers through on-farm Field Days hosted at River Garden Farms and presentations. We will work closely to share results and lessons learned with the California Rice Commission for their pilot project to implement cover crops on post-harvest rice.	$99,696.36	$58,235.04	Yolo	34.5
The Regents of the University of California, ANR	This project is designed to create and demonstrate a region-specific approach to establishing native dominant perennial hedgerows appropriate for Northern California coastal range habitats. We predict this project will offer multiple benefits, both educational and ecological, including opportunities to research and share methods for: enhancing soil health, increasing soil carbon sequestration, and providing habitat and food sources for beneficial organisms. By using our UC Hopland Research and Extension Center's long history of successful research projects, extensive regional partnerships, and strong existing inter-organizational collaboration networks, combined with excellent onsite extension infrastructure and personnel, we can leverage this project into a long term and well utilized showpiece for educating diverse relevant audiences how to use hedgerows to improve soil health and related ecosystem services on their lands.	$98,246.41	$23,835.00	Mendocino	0.6
CommuniCare Health Centers	The Healthy Soils, Healthy Humans project will be located on a parcel owned by CommuniCare Health Centers in a diverse, low-income neighborhood of Woodland, California. Healthy Soils, Healthy Humans will demonstrate the following soil management practices: cover cropping, compost application, and tree/shrub establishment. Project activities will complement a .25-acre clinic-based garden demonstrating a food is medicine approach to preventive health. An annual field day will be the showcase outreach event and will be complemented by at least 5 other workshops per year. Patients already engaged in health center programming will be invited to participate in Healthy Soils, Healthy Humans outreach events along with members of the broader community, including farmers, gardeners and others interested in connections between soil and human health. Soil organic matter will be evaluated at baseline and annually in the spring, and outreach events will be evaluated via surveys and continuous participant engagement to assess increased knowledge and application of improved soil management practices. Healthy Soils, Healthy Humans will demonstrate methods to rejuvenate previously vacant urban lots and will highlight important co-benefits for human health including improved air quality, improved access to nutrient-dense fruits and vegetables, and increased shade cover to reduce urban heat islands.	$99,513.00	$23,881.00	Yolo	2.1

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Ca. Land Stewardship Institute	The California Land Stewardship Institute (CLSI) is proposing a demonstration project of converting full tillage to reduced tillage (every other avenue) along with planting organic matter maximizer cover crop. Our treatment and control fields will both be planted with the cover crop but vary with full tillage on the control field and reduced tillage on the treatment field. We will also plant a number of hedgerows on the border of the vineyard to sequester carbon and support beneficial insects and pollinators. This vineyard is one soil type (Huichica loam) allowing for an easier comparison between the treatment and control fields. Both fields have used full tillage for many years. The two fields are side by side blocks of nearly the same size and are planted with the same variety of grapes. This arrangement makes for a good comparison of the tillage practice on soil organic matter (SOM), irrigation water use/soil moisture and production levels. The Sonoma County Winegrape Commission (SCWC) office is located at this site. The SCWC has over 1800 members. This proximity will allow growers to easily see, learn about and discuss the demonstration project. We will also be able to easily attract growers to workshops.	$85,851.37	$30,000.00	Sonoma	20.9
Cachuma Resource Conservation District	The project will demonstrate the implementation of the Silvopasture management practice on grazed grassland. The objectives of the project are to sequester carbon, reduce atmospheric GHGs, improve soil health, increase biodiversity, enhance the site's water cycle, improve livestock distribution by increasing shade resources, provide supplemental sources of livestock forage and to share learnings from the project with the public, particularly other farmers and ranchers. A combination of native oak trees, native shrubs and livestock forage-producing trees and shrubs will be planted on 3, 1-acre sites. Three outreach events will communicate both the economic and ecosystem service benefits of the practice and introduce other graziers to species of trees and shrubs that may provide supplemental forage onsite to replace the need for trucking in additional feed especially in times of drought. This project offers the opportunity to highlight the silvopasture practice in a region not typically associated with it and during a time when we're experiencing an increased focus on how agroecology & agroforestry can increase resilience on working lands seeking to adapt to a changing climate.	$99,662.43	$0.00	Santa Barbara	2
The Regents of the University of California	Vermicomposting offers important benefits for agriculture. The purpose of this project is to quantify how vermicompost application affects soil health and greenhouse gas emissions from soils in a walnut orchard and annual crops in Yolo County, California. Integrating vermicompost into standard agricultural practices has a high potential to improve soil health, mitigate climate change, and sustainably increase harvestable yield of crops. Vermicompost is nutrient-enriched, it benefits the microbial community, promotes plant growth, supports soil carbon sequestration, and suppresses soil and plant disease. As California moves to divert organic waste from landfills, vermicompost represents a competitive alternative soil amendment to green and food waste compost. This projectâ€™s outcomes are expected to develop guidelines for using vermicompost as a soil amendment and could facilitate the development of vermicompost production in California to diversify soil amendment products available to agriculture. Project outreach activities will familiarize farmers and the broader agricultural sector with the economic and environmental benefits of using vermicompost application as an agronomic practice.	$248,119.00	$36,058.00	Yolo	9

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2020 HSP Demonstration Projects - Applications Submitted to CDFA *

Applicant Organization	Project Description	Funds Requested	Cost Share	County	GHG Reduction Estimation ($MTCO_2$ eq/year) **
Santa Rosa Junior College	This project will establish a field scale demonstration site in pastures at Shone Farm, our 365-acre hands on learning laboratory. We will apply compost to 20 acres of pasture, plant 3 acres of riparian forest buffers, and apply prescribed grazing across our pastures. We anticipate that these practices will improve soil conditions, forage production, and the health of the farm watersheds. The project will offer multiple outreach events including field days on Composting and Compost Application and Soil Health and Grazing; a grazing school with UC Cooperative Extension; and project tours. The project will be integrated into our classes in both Sustainable Agriculture and Animal Science. Students will participate in data collection and we will develop an online learning module to reach a wide audience of students. Project success will be evaluated based on participation in field days, participant surveys, measurable changes in soil properties and forage production, and intended adoption of practices by producers in our region. We are well positioned to achieve our project goals of improving the ecological conditions of our site, utilizing the project to develop job training opportunities, and to reach a wide agricultural audience.	$99,432.00	$92,800.00	Sonoma	98
The Regents of the University of California	We will demonstrate compost applications in the Sacramento Valley, which in other regions, have successfully improved soil health and function. Our goal is to implement practices that increase soil carbon and nitrogen and minimize fertilizer inputs, thus improving overall soil health in conventionally managed annual systems. We expect that compost application will improve soil function while maintaining or increasing yields. This demonstration would showcase healthy soil practices for annual crop farms in California, specifically focused on processing tomatoes. We know from dialogue with area farmers that there is interest in sustainability and healthy soils practices, but little information or experience of the practicality or profitability of these amendments is available for conventional farmers. Adoption of these practices is challenging due to the long-term rewards, rather than short-term benefits, and the challenges of introducing another practice to the system. We believe that this project will help push toward more sustainable soil health management in annual crops, especially processing tomatoes.	$99,629.28	$0.00	Sutter, Colusa	442.7
Rodale Institute	The trend of current agriculture to maximize agricultural yields, through intensive cultivation techniques has progressively compromised the fertility of conventional and organic croplands. The goal of the project is to provide on-the-ground demonstrations of conservation management practices that increase soil health while building an understanding of the quantified soil health and soil microbial community outcomes from compost application. Furthermore, CO2 soil flux will be measured to estimate compost contribution to carbon sequestration. A split plot design of 4t/a compost vs no compost treatment on a three years crop rotation will be developed on certified organic cropland in Camarillo, CA. Baseline data for soil health metrics and farmer awareness of soil health practices will be compiled at the start of the project. Data collection on soil health and nutrition, soil respiration, soil microbial biomass quantification and total production will occur throughout the project term. Results will be communicated via public-friendly materials including fact sheets, flyers, and web articles on Rodale Institute farmer website. On-farm demonstration events at the project site will occur each year to showcase HSP practices to farmers and will include presentations on the relevance of compost in regenerative farming and its impact on carbon sequestration and GHG reduction.	$237,818.00	$37,959.00	Ventura	0.4

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Resource Conservation District of Greater San Diego County	This Demonstration Project will highlight the benefits of cover crops in an avocado orchard on soil health, water moisture, water infiltration, cost savings, and the environment. Cover crops are gaining interest because of their ability to improve soil fertility and ecosystem services, while protecting crops from extreme and frequent climatic events; they also have the potential to reduce greenhouse gas emission by 2.9 metric tons of carbon dioxide equivalent per year. Regionally specific examples of climate-smart agricultural practices are important for our agricultural community and will help to protect agricultural lands from conversion to urban or non-irrigated use. This project is located on 3.2 acres at SGG Farms (Escondido, CA), where three varieties of cover crops will be planted during the cool season on three treatment fields adjacent to their counterpart control fields. Our outreach strategy will target local and small farmers, many of whom are seeking solutions to financial struggles and severe climatic events. Through interactive field events and wide project dissemination, we seek to demonstrate the management and ecological and financial benefits of cover cropping at this unique orchard on local, regional, and state levels.	$99,999.90	$10,920.00	San Diego	1.8
Promotores Unidas Para La Educacion Nacional Tecnologias Sostenibles	Bogg's Tract Community Farm (BTCF) Carbon Drawdown Project will demonstrate practices that can be adapted by community or medium-scale farms focused on environmental regeneration and producing nutritionally dense food for urban markets. Heavy nutrient feeding crops - corn, beans, melons and brassicas will be grown by providing fertility produced on farm through various methods. The treatment protocol is cover crops which are terminated either by a roller-crimper, followed by drilled in seed, or terminated through prescribed grazing followed by drilled in seed. The control plot will be left fallow. To maximize carbon drawdown, increase soil health and biodiversity, as well as to provide integrated pest management for the farm, field borders and hedgerows will also be included in this project, as well as an on-farm compost production facility to further sequester carbon and maintain our farm's fertility without GHG emissions. Co-benefits of this project will include an improvement in local air quality for the surrounding community which bears the highest air and water pollution burden score (according to CAL EnviroScreen data), and increased production of nutritiously dense food made available to residents of the food desert surrounding project.	$97,833.86	$18,498.60	San Joaquin	3.2
White Buffalo Land Trust	This demonstration of alley cropping in the San Joaquin Valley will compare soil health and production outcomes in an organic cotton production system to an adjacent system that integrates olive and mulberry tree crops into an alley cropped organic cotton production system. The project will encompass a 10 acre parcel in Kern County divided into two equal sections for the treatment and control portions of the demonstration. Project outcomes will include data gathered on soil heath, yield and economic return. Three on-site field days, one in each project year, in addition to presentations at farming conferences and speaker series programs hosted by the collaborating organizations, will bring the project to a wide audience of farmers, including at least 120 farmers attending an in-person presentation. Additional outreach will include digital and print articles and a two-page infographic to be shared with farmers and TA providers.	$97,447.61	$2,000.00	San Joaquin	4

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California State University, Fresno Foundation	This project is proposed to demonstrate whole orchard recycling practice as it contributes to air quality improvement. It will compare and contrast differences attributable to rototilling, plow/disc, and disc methods for incorporating the tree chips in association with comprehensive use of other best management practices (e.g. manure application, cover cropping, no till).	$99,979.00	$51,000.00	Fresno	Not applicable

* The 2018 HSP Demonstration Projects application information was extracted from the online application system as submitted, therefore, CDFA cannot guarantee accuracy of the information.

** Total emission reduction is estimated by the applicant and has not been verified.