From:	Ingram, Campbell@SSJDC <campbell.ingram@deltaconservancy.ca.gov></campbell.ingram@deltaconservancy.ca.gov>
Sent:	Friday, September 27, 2019 12:19 PM
То:	CDFA Healthy Soil Program_Technician@CDFA
Cc:	Lester Moffitt, Jenny@CDFA
Subject:	Healthy Soils Program Comment
Categories:	Green Category

Dear Secretary Ross,

Please consider adding Re-saturation of Delta Organic Soils to the list of approved practices within Group 1 of the Healthy Soils Program. Re-saturating Delta organic soils through rice cultivation or managed wetlands stops GHG emissions of between 3 and 26 metric tons per acre per year. Collectively the 200,000+ acres of deeply subsided land in the central and western Delta contribute over 2,000,000 tons of CO2 emissions per year, the equivalent of over 500,000 vehicles. Additionally, the ongoing subsidence increases the risk of failure of the western Delta which could result in long-term interruption of water deliveries to San Joaquin Valley agriculture and 27 million Californians who depend on Delta exports for all or part of their water supply. The subsidence is the result of microbial oxidation of organic carbon when the peat soils are de-watered to grow agricultural crops. Re-saturating the soils stops the subsidence and the emissions. Due to these extraordinary rates of CO2 emissions, there is no other natural and working landscape in California that can provide a higher emission reduction/risk reduction per dollar invested.

There has been over 20 years of research documenting the rates of subsidence and GHG gas flux in the Delta, culminating in the development of a protocol approved for use on the voluntary market by the American Carbon Registry. We anticipate that the Air Resources Board will consider adopting this protocol into the AB-32 Compliance program in their next round of protocol development. The voluntary carbon market can currently exceed lease values and if adopted into the compliance program will exceed commodity values of most crops cultivated in the deeply subsided areas of the Delta. However, the costs of converting from current commodities to rice or managed wetlands are prohibitive and support from the Healthy Soils Program and other funding sources is necessary to realize the avoided emissions and subsidence cessation. We have been working with public and private land owners and many are interested in moving forward provided sufficient assistance for conversion is available.

Please consider adding a re-saturation practice to the Healthy Soils Program and feel free to reach out if you have questions or need additional documentation.

Thank you, Campbell

Campbell Ingram

Executive Officer *Sacramento-San Joaquin Delta Conservancy* 1450 Halyard Drive, Suite 6 West Sacramento, CA 95691

916.375.2089 direct 916.281.4145 mobile

"A partner for balanced ecosystem restoration and economic development in the Delta."

www.deltaconservancy.ca.gov



Whitaker, Andrew@CDFA

From:	Kandi Manhart <kandi@glenncountyrcd.org></kandi@glenncountyrcd.org>
Sent:	Thursday, October 3, 2019 3:30 PM
То:	CDFA Healthy Soil Program_Technician@CDFA
Subject:	HSP Comment

To Whom This May Concern:

I attended the public workshop held on September 23, 2019 in Orland. Thank you for making in person meetings available for our growers.

In regards to the inability for funds to be used for "Implementing on-going or existing practice(s) on fields <u>within the</u> <u>same APN</u>", I encourage the CDFA HSP program to consider the ability to fund within the same APN, <u>but within a</u> <u>different field boundary</u>. As you know field boundaries and APN boundaries do not always align; one APN may include 1 to many different fields / crop types.

Please consider looking at incorporating Field IDs to the APNs unique identifier.

If you have any questions or need additional information, please let me know. I can be reached at 530-934-4601 x5.

Thank you for this opportunity!

Kandi

KANDI MANHART EXECUTIVE OFFICER GLENN COUNTY RESOURCE CONSERVATION DISTRICT office 530.934.4601 x3171 main 530.934.4601 x5 kandi@glenncountyrcd.org 132 N Enright Avenue, Suite C, Willows, California 95988 www.glenncountyrcd.org

Together we can. To promote a sustainable, economically healthy county through services and management of natural resources while maintaining a desirable environment and addressing local resource issues and opportunities in a timely manner.



October 9, 2019

The Honorable Karen Ross Secretary California Department of Food and Agriculture 1220 N Street Sacramento, CA 95814

Re: Consideration of WOR as an Eligible Practice under the Healthy Soils Initiative

Dear Secretary Ross:

On behalf of the Almond Board of California and our growers, we want to express our appreciation for the efforts by the staff of CDFA, as well as ARB, to assess the greenhouse gas sequestration/emissions potential of a practice known as "whole orchard recycling" (WOR); and to recommend that this practice be included in the practices eligible for incentive funding by the Healthy Soils Initiative.

Whole orchard recycling is when the trees are pushed out at the end of the orchard's lifetime, the woody biomass is ground up (chipped), spread over the area, and incorporated into the soil. The woody biomass is storing carbon as the trees grow and by incorporating the woody biomass into the soil that carbon is gradually broken down, extending the sequestration of the carbon. While some of the carbon is released as CO₂ by microbial breakdown, some is incorporated into the microbial biomass further sequestering the carbon in the soil. More recent data indicates that some of the carbon moves deeper into the soil further slowing the potential for re-emission.

The data we are citing above is based on years of research that the Almond Board of California (ABC) has funded in different areas of almond production, including data on nitrous oxide emissions under a variety of circumstances, the development of an almond DNDC (deNitrification-deComposition) model (supported by a Specialty Crop Block Grant), irrigation management, and data from the first WOR study site. ABC, along with CDFA, is funding work at additional sites to better understand how best to implement WOR and the impacts of the chips on soil and tree quality. The data from the first location at Kearney Ag Center, which is going into its 10th year, along with the initial data from more recent trials, indicates that the soils are improved after incorporation of the chips, although it may take several years to be noticeable to the grower.

Almonds are currently grown on approximately 1.3 million acres in the Central Valley of California. Orchard removal rates depend on the number of acres planted roughly 25 years earlier as well as other factors. We currently estimate that about 25,000-40,000 acres (~10,000-16,000 ha) per year will be removed for the next five years for aging reasons. According to the report by Wolfe and Guo, 5.84 to 8 metric tons of CO_2 equivalents/ha are stored with WOR. Thus, if 50% of the removed almond acreage were to use WOR, some 29,000 to 64,000 metric tons of CO_2 equivalents would be sequestered for each of the next 5 years. That would be the equivalent to removing 6,000-13,000 cars for a year (assuming 22 mpg and 11,500 miles/year). In addition, that woody biomass would be enhancing the microbial populations in the soil and gradually releasing nutrients to the soil.

While the practice has so far been tested in almond-to-almond and peach-to-almond replant sites, the practice should work for other woody perennial cropping systems as well. Between almonds, walnuts, pistachios, grapes, citrus, pomegranates, prunes, cherries, olives, etc., there are some 3 million acres of woody perennials planted in California. The practice may not be appropriate for all tree types, particularly



if the chipped wood could transmit woody diseases. But there is tremendous potential for this practice to be more widely adopted within the unique specialty cropping systems that predominate in California agriculture.

We again want to thank CDFA for compiling and reviewing the data on the carbon sequestration potential along with soil quality impacts of the use of whole orchard recycling. Based on that analysis, WOR should be a practice eligible for Heathy Soil incentive funding.

Sincerely,

Jubisch ludy

Gabriele Ludwig, Ph.D. Director, Sustainability and Environmental Affairs

Cc: Amrith Gunasekera, CDFA Jenny Lester-Moffit, CDFA

From:	Niki Mazaroli
To:	CDFA OEFI@CDFA
Cc:	Allison M Rowe
Subject:	Comment/questions re. Healthy Soils Framework
Date:	Friday, October 11, 2019 3:22:21 PM

Hello,

I recently reviewed the Healthy Soils Framework for 2019-2020 as outlined in the Meeting Presentation available on your website.

It is exciting to see that elements of agroforestry (alley cropping and multistory cropping, group IV) are included. My question is: Where can I learn more about the "Woody Cover Establishment on Annual Cropland" category (group VI), and why is it a separate group from group IV?

I'd suggest instead creating an alternative category: "Perennial and woody crop establishment on annual cropland". These would allow for the recognition of more agroforestry practices (of which two are mentioned in group IV) that are known to protect and build healthy soil.

I am happy to provide peer reviewed research in support of the above statement. The USDA National Agroforestry Center website is a great resource <u>https://www.fs.usda.gov/nac/practices/index.shtml</u>.

Thank you for your efforts and consideration!

Best, Niki Mazaroli

--Niki Mazaroli <u>Strategy Research Science</u> <u>niki@strategyresearchsci.com</u> 917-969-7459

LinkedIn: <u>https://www.linkedin.com/in/nikimazaroli/</u> Twitter: @foodfromforests



October 16, 2019

Sent via email: cdfa.oefi@cdfa.ca.gov

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

RE: Healthy Soils Program

To whom it may concern:

The California Farm Bureau Federation (Farm Bureau) is writing to provide input into further refinement of the Healthy Soils Program (HSP). Farm Bureau represents more than 35,000 members as it strives to protect and improve the ability of farmers and ranchers engaged in production agriculture to provide a reliable supply of food and fiber through responsible stewardship of California's resources. Farm Bureau appreciates the opportunity to provide input into the next grant opportunity for the HSP.

California agriculture provides significant opportunities for increases in carbon sequestration through management of soils. Ensuring that the funds available through the HSP are fully utilized should be a top priority. A significant impediment to greater acceptance by California's farmers and ranchers has been the complexity of the application process. Farm Bureau appreciates the elimination of the essay-type questions from the application and urges a continued focus on simplifying the application process to make it easier for farmers to access. This is particularly important for small and mid-sized farmers who don't have the resources to pay for application assistance either through the dedication of an employee's time or by hiring outside consultants.

Farmers have mentioned challenges with the complexity of the budget worksheet included in the application. Farm Bureau would recommend that CDFA simply ask for information about the farm and specific practices for which the farm is applying. With that information, CDFA can estimate the payment rather than asking individual farmers to estimate those payments. This shift would reduce the burden on farmers and ranchers, which is likely to increase interest and participation in the HSP. Farm Bureau also urges CDFA to consider reimbursements for compost and cover crop seed purchases. Reimbursements would also serve as a way of simplifying the program, which would lead to expanded participation in the HSP.

There are a wide range of practices that can help improve California's soil health. With California's diversity of cropping systems and soil types there is not a one-size-fits-all tool for soil health. The HSP has the potential to help farmers expand their efforts on implementing practices that can improve soil health. Farm Bureau urges CDFA to look for ways to reduce the complexities associated with participating in the HSP and to work with farmers and ranchers to

October 16, 2019 Page 2

identify current barriers preventing them from expanding their current efforts at improving soil health.

Again, Farm Bureau appreciates the opportunity to comment on the HSP and appreciates the effort being taken to ask for input from farmers and ranchers on how best to improve the program. Farm Bureau looks forward to a successful roll-out of the next round of funding for the HSP.

Sincerely,

Noelle G. Cremers Senior Policy Advocate



455 Capitol Mall Suite 415 Sacramento, CA 95814

916-737-5707 ca.audubon.org

October 23, 2019

California Department of Food and Agriculture Office of Environmental Farming & Innovation 1220 N Street Sacramento, CA 95814 Delivered via email: cdfa.HSP_Tech@cdfa.ca.gov

Re: Healthy Soils Program

To Whom It May Concern:

On behalf of Audubon California, I am pleased to submit comments on CDFA's Healthy Soils Program. Audubon has a long history of working with landowners in the Central Valley to implement many of the practices offered through CDFA's Healthy Soils Program. We are pleased to see CDFA offer a program that elevates working lands as part of the climate solution. Not only does the program help achieve the state's climate goals, it also serves to provide the multiple benefits of improved water and soil quality and habitat for birds and other wildlife.

As a grantee of a Healthy Soil Demonstration project in 2017, we share our feedback and lessons learned with the intent to improve functionality and efficiency of future iterations of the Healthy Soils Program to ensure maximum benefit on the ground. Our comments are as follows:

Use of Assessor's Parcel Numbers (APNs): APNs are not commonly used as the basis for practice implementation on farms in California. Practices are implemented according to the individual field names as designated on farms. Multiple farm fields (and some farms) may, and usually do, exist within one APN. CDFA's requirement to "implement at least one HSP practice on the same APN(s) during the project term" does not ensure that the practice will be implemented on the same *field* in subsequent years. Nor does using the APN ensure that soil samples are taken from the field where the practice was implemented. Additionally, in is unclear why funds cannot be used for "implementing on-going or existing practice(s) on fields within the same APN". A landowner may want to implement practices on or alongside more than one field and we do not see a reason to prohibit this. Further, in some cases, an entire farm may lie within the same APN, rendering a farmer ineligible for multiple years of funding from the Healthy Soils Program.

We recommend applying practices according to the farm fields, in a manner similar to how NRCS enrolls farms in their cost-share programs. Maps of farm fields can be provided as part of the application process. We also recommended allowing implementation of practices on different fields within the same APN.

 Program Flexibility: The Healthy Soils Program has certain requirements, specifically the linking of practices to APN's (or, as in our recommendation, fields), that need built-in flexibility to ensure effectiveness of the program on the ground. Due to the nature of farming and inability to control certain factors, farmers need to be able to respond to changing conditions. Sometimes this requires moving practices from one part of the farm to another. In our experience, this is not possible due to audit requirements. We strongly encourage CDFA to allow flexibility in practice implementation location to ensure effective implementation on the ground.

We recommend allowing changes to practice siting as long as the ghg benefits remain the same or are improved.

• Outreach requirements: We understand the goal of "creating a platform [for] promoting widespread adoption of conservation management practices throughout the state". That said, the program requirement for "a minimum of 120 different individual farmers and/or ranchers during the project term" to visit the demonstration project site has proven to be unrealistic. After hosting 2 field days with remarkable turnouts of 80 and 100 people each, we are only at the halfway mark to the 120 farmer/rancher requirement. We have employed an extensive outreach plan to our own network, that of our partners, and targeting other agricultural stakeholders. There are other ways to reach the farming community beyond field days, which can be just as impactful and we encourage CDFA to allow other activities to count toward the outreach goal.

We recommend a reduction in the farmer/rancher attendee requirement and/or inclusion of webinars and presentations to grower focus groups about the demonstration project as allowable forms of outreach to meet the program requirement. We also recommend allowing farmer and rancher visits to the demonstration sites outside of formal field day events to be counted towards the outreach requirement.

• Award limits: We have experienced for ourselves the limitations of the award amounts available through the Healthy Soils Program. Our Demonstration Project relied heavily on our partner farm to provide a significant amount of cost-share for the implementation of the Healthy Soils Practices. Most farms do not have the ability to carry this amount of financial burden. Even with the farm's immense financial contributions, we have run up against the limits of the funding for things such as food. The State's \$11/person limit does not allow for a proper lunch to be

served at the Field Day & Farm Tour events without incurring overages. We have also received feedback from the farming community that the Healthy Soils Incentive Program payments do not provide adequate funding for a 3-year practice implementation, forcing them to lose money on the installation of practices. The \$25,000 contributed by our partner farm for the installation of cover crop and riparian vegetation far exceeds the limits of the demonstration project. With the infusion of funding for the Healthy Soils Program from Prop 68, we suggest increasing the amount available per project.

We recommend increasing the total award limit for all Healthy Soils grants to reflect current market values of seed mixes and labor and machine costs. We also recommend increasing the food allowance per person to cover catering costs associated with holding an on-farm event, which are often rural and can incur extra charges for delivery.

Administrative Burden: There is undue administrative burden in the Healthy Soils
Program on the side of the grantee and CDFA. Multiple staff are required to work
on behalf of the grantee to prepare the detailed and multi-layered financial
reporting documentation as required by CDFA. Then, multiple staff at CDFA
review and approve. These administrative costs are not captured in the program
budget yet inflate the actual costs to the grantee. We find the Timekeeping
Requirements, which require a specific CDFA form in addition to providing
organizational timekeeping records, especially burdensome.

We recommended allowing finance and administrative staff time in the budget and removing the requirement to submit a Time & Activity Report.

Overall, we congratulate CDFA on supporting projects that contribute to the reduction in greenhouse gas emissions and improve soil health while also providing benefits for the state's migratory birds and other wildlife. We provide our comments in the spirit of improving functionally and efficiency in the Healthy Soils Program to ensure its ongoing success.

Thank you for considering our comments. We look forward to continuing to work with CDFA on making working lands part of the climate solution.

Sincerely,

Alpan M.Stum

Khara Strum Conservation Project Manager Audubon CA



October 23, 2019

Secretary Karen Ross and OEFI Staff California Department of Food and Agriculture 1220 N Street Sacramento, CA 95814

Re: Comments on Healthy Soils Program

Dear OEFI Program Staff and Secretary Ross;

Thank you for the opportunity to submit comments regarding CDFA's Healthy Soils Program on behalf of Fibershed, a California nonprofit organization.

Fibershed's Producer Membership includes over 100 producers of fiber animals and crops across 51 counties of Northern and Central California. Our work emphasizes outreach, education and support for carbon farming, as well as development of textile processing and supply chains based on fiber products derived from farms and ranches where carbon farming is being implemented.

We were delighted that eight of our producer members were awarded Healthy Soils Program (HSP) grants in 2019, and we will continue to encourage our producer members to increase their adoption of carbon farming practices through the support of HSP funding opportunities. In each of the previous funding rounds, many of our members have expressed interest in a potential HSP project, but then declined to move forward. The reasons for this were either due to the burden of the program application, insufficient payment rates to cover practices costs, or unworkable requirements of the grant program.

We offer the following recommendations for your consideration, based on our experience helping producers navigate the HSP opportunity, and working with both producers and RCDs.

Increase capacity for Technical Assistance

Technical Assistance (TA) to help producers in planning projects, applying for funds, and implementing projects, is essential to the success of the HSP program. While we are very glad to see an expansion of HSP-supported TA available through the new TA program this year, we are concerned that this will still be insufficient to meet the needs of producers who are interested in adopting these new practices, but require assistance in making those management changes and in applying for funding. Several of the RCDs that our producer members work with have decided not to apply for TA funding this year through CDFA due to the compensation rate not being adequate to cover their expenses.

- We encourage you to raise the percentage of funds allocated to TA from the Climate Smart Ag Program funding, or else work to help secure additional sources of reliable and ongoing core funding for RCDs and other publicly-funded (independent) TA providers.
- Allow RCDs to claim a higher indirect rate to encourage more RCDs to participate in the TA program, and ensure that RCDs who are participating can cover their full costs.

Streamline application burden for producers

The burden of time on the part of producers applying for HSP funding continued to be a barrier that prohibited several of our producer members from applying.

- Streamline the application process to significantly reduce the burden on producers, especially smaller scale producers whose capacity for added administrative tasks is often very limited
- We encourage you to consider a block grant system for smaller producers to receive awards directly through a Technical Service Provider, in order to remove the administrative burden from smaller scale producers

Increase incentive rate payments based on actual cost data

Incentive rate payments that require a significant matching contribution from producers continues to be a barrier for HSP adoption, especially for practices with a low or long-term economic payback for producers. In order to incentivize producers who are not already highly motivated to implement these practices (and early adopters have likely already enrolled in the previous two funding rounds,) the funding provided must better match the actual costs of practices. For example, for woody plantings to be successful, producers need to purchase not only nursery stock, but plant protection and irrigation infrastructure. Labor costs for these installations, especially over a large scale and in remote rural areas, can be very significant. Maintenance and replacement/repair costs in these woody installations can also be quite high. While many of our producers have been interested in hedgerows, riparian restoration and other woody planting projects, these costs have often been too high relative to the HSP payment to incentivize adoption, especially at larger scales.

- Increase incentive rate payments to cover more fully the costs of implementation.
- Seek historical data on actual costs of implementation from RCDs for projects they have managed in cooperation with producers

Allow expansion of existing practices and incorporation of new practices on land already enrolled in the program.

Currently, producers are prohibited from re-applying to HSP to adopt additional practices or expand existing practices on an APN that has already received funding through HSP. The nature of building healthy soils and maximizing carbon sequestration on a landscape necessitates stacking practices to maximize impact. This prohibition on re-applying for the same APN disincentivizes a producer to try something at a smaller scale that they might be able to scale up later, or to implement different practices in phases that might work better for their operation. Many producers cannot afford either the funding or the time in one year to implement the maximum area available on their property for certain practices such as riparian restoration, hedgerow establishment, or other woody and conservation plantings.

• Allow producers who have already received HSP funding to apply again for new practices or expansion of current practices onto new acreage/fields.

Change Requirement for Annual Compost Application to Grasslands

The majority of our producer members raise livestock on rangeland or pastures. Many of them would be interested in compost application to rangeland, based on the results from research across the state over the past 10 years¹². Because rangelands do not typically receive

¹ Silver, Whendee, Sintana Vergara, Allegra Mayer. (University of California, Berkeley). 2018. *Carbon Sequestration and Greenhouse Gas Mitigation Potential of Composting and Soil Amendments on California's Rangelands*. California's Fourth Climate Change Assessment, California Natural Resources Agency. Publication number: CCCA4-CNRA- 2018-002.

² **Ryals, R.**, M. Kaiser, M.S. Torn, A.A. Berhe, and W.L. Silver. 2014. Impacts of organic matter amendments on carbon and nitrogen dynamics in rangeland soils. Soil Biology and Biochemistry. 68: 52-61.

amendments, this is a dramatically new practice for producers to consider adopting. The funding gap that remains between the HSP incentive payment and the actual cost to purchase compost, transport and spread it onto rangelands is still significant in many areas. In addition to funding, the time involved with logistics of coordinating compost delivery and application each of three years is a barrier to adoption for most producers, especially when the peer-reviewed research that has been conducted in California is based on a protocol of one-time application of compost to rangelands (with models projecting at least 20 years of continued carbon sequestration benefits). If the intention of HSP is to incentivize a practice that could be adopted widely across California's rangelands to help sequester carbon at scale, a three-year application protocol does not provide a reasonable model and does not follow the science that has been established across the state.

• Change the three-year rangeland compost application requirement to a one-time application, to match the practice protocol used in research across the state

Change annual soil sampling requirement

Changes in soil organic matter content will typically take several years to accrue, especially for some of the practices included in the program. Annual sampling is an unnecessary burden on producers, given the likelihood that changes in soil organic matter/carbon will take longer to see for many practices.

- Clarify the purpose and role of soil testing by producers in this program
- Remove annual soil sampling requirement

Thank you for your consideration of these recommendations, which we hope will be helpful to increase the success and impact of the Healthy Soils Program across the agricultural landscapes of California.

Sincerely,

Ribecca Burgm

Rebecca Burgess Executive Director, Fibershed





October 23, 2019

California Department of Food and Agriculture Office of Environmental Farming and Innovation 1220 N Street Sacramento, CA 95814 <u>cdfa.HSP_Tech@cdfa.ca.gov</u>

Re: Healthy Soils Program Comments

Dear OEFI Staff,

Thank you for the opportunity to comment on the Healthy Soils Program. We have signed on to the joint comments prepared by the California Climate and Agriculture Network (CalCAN) and support the letter previously submitted on August 29 of this year by California Certified Organic Farmers (CCOF) as well. Here we add a few complementary comments.

We welcome the state's growing recognition of the importance of healthy soils, associated with critical increased funding for healthy soil practices, but we note that the current Healthy Soils Program, as currently constituted, is a bit of a misnomer. We believe it is time the Healthy Soils Program incentivize not just positive cultural and physical practices that help build healthy soil, but also incentivize the reduction in chemical practices that negatively impact soil health.

We recommend the Healthy Soils Program adopt two new practices:

- First, because the soil fumigants chloropicrin, metam sodium and metam potassium approximately 30 million pounds of which are applied to California soils each year pose serious threats to the goals of building and maintaining healthy soils and cause 7-fold to 100-fold releases of the potent greenhouse gas nitrous oxide (N₂O), we believe the reduction of these fumigants should be incentivized by the Healthy Soils Program.
- Second, we wholeheartedly support CCOF's recommendation that an organic transition support package be included within the Healthy Soils Program.

Rationale: Synthetic pesticides harm the soil biological community and its functions

According to the 2017 Human Rights Council of the UN General Assembly "Pesticides can persist in the environment for decades and pose a global threat to the entire ecological system upon which food production depends. Excessive use and misuse of pesticides result in contamination of surrounding soil and water sources, causing loss of biodiversity, destroying beneficial insect populations that act as natural enemies of pests and reducing the nutritional value of food."¹

Only about 0.1% of applied pesticides reach the targeted organism while the remaining amount contaminates the soil and surrounding environment. The soil biological community associated with healthy soil is extraordinarily diverse — from spatial heterogeneity and organism diversity to function (e.g. nutrient cycling and acquisition, suppression of phytopathogens, and providing resistance to biotic and/or abiotic stressors).

Ample research documents the detrimental effects synthetic pesticides have on the soil biological community and soil health. Organochlorine pesticides inhibit nitrogen-fixing rhizobia bacteria, increase dependence on synthetic fertilizers and reduce overall plant yield.² Synthetic fungicides are associated with decreases in populations of nitrogen-fixing bacteria, increased populations of denitrifiers³, and decreases in the number and type of soil fungi and formation of macroaggregates, which are essential to good soil structure.⁴ The systemic herbicide glyphosate, which is widely used in California, reduces populations of soil microbial communities and disrupts nutrient cycling processes, reducing bioavailability of essential micronutrient and macronutrients, increasing reliance on mineral fertilizers, and reducing essential nutrient content in associated food crops.⁵ Applications of the common soil fumigant metam sodium has shown persistent damage (lasting at least 4 months) in various microbial-mediated functions, including nutrient cycling.⁶ Neonicotinoid insecticides, which can persist in soils for years, can cause significant adverse effects on key soil organisms, including earthworms, soil microbes and decreased fungal abundance, and can lead to significant changes in levels of nitrate-N, ammonium, nitrite-N, and nitrate reductase enzyme activity, among other impacts.⁷ Pesticide applications result in a population shift from beneficial soil bacteria and fungi-feeding nematodes, essential for organic matter decomposition, nitrogen cycling, and biological control,

¹ Fox E, Gulledge J, Engelhaupt E, Burow ME, McLachlan JA. 2007. Pesticides reduce symbiotic efficiency of nitrogen-fixing rhizobia and host plants. PNAS vol. 104 no. 24 10283.

² Fox E, Gulledge J, Engelhaupt E, Burow ME, McLachlan JA. 2007. Pesticides reduce symbiotic efficiency of nitrogen-fixing rhizobia and host plants. PNAS vol. 104 no. 24 10283

³ Martinez-Toledo MV, Salmeron V, Rodelas B, Pozo C, Gonzalez-Lopez J. 1998. Effects of the fungicide Captan on some functional groups of soil microflora. Applied Soil Ecology 7: 245–255; doi: https://doi.org/10.1016/S0929-1393(97)00026-7.

⁴ Kalia A and Gosa SK. 2011. Effect of pesticide application on soil microorganisms. <u>Archives of Agronomy and Soil Science</u>, <u>Volume 57</u>, <u>Issue 6</u>

⁵ <u>Mertens</u> M, Hoss S, Neumann G, Afzal J, <u>Reichenbecher</u> W. 2018. Glyphosate, a chelating agent—relevant for ecological risk assessment? <u>Environ Sci Pollut Res Int</u>. 25(6): 5298–5317. <u>https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5823954/</u>

⁶ Macalady JL, Fuller ME, Scow KM. 1998. Effects of Metam Sodium Fumigation on Soil Microbial Activity and Community Structure. J. Environ. Qual. 27:54-63.

⁷ Madeleine C, Kreutzweiser D, Mitchell EAD, Morrissey CA, Noome DA, Van der Sluijs JP. 2015. Risks of largescale use of systemic insecticides to ecosystem functioning and services. Environ Sci Pollut Res 22:119–134.

to greater proportion of plant-parasitic nematodes.⁸ Several pesticides decrease reproductive success, juvenile survival, and overall development in earthworms, which are vital for good soil structure and fertility.⁹

Rationale: Synthetic pesticides, especially certain soil fumigants, contribute to greenhouse gas emissions and reduce soil carbon sequestration

Although generally excluded from state emission estimates, synthetic pesticides contribute directly to greenhouse gas emissions. Pesticide production is an energy-intensive process, with fumigant production alone (roughly 17% of California's agricultural pesticide use) utilizing approximately 500,000 gigajoules of energy per year, likely an underestimate.¹⁰

Nitrogenase activity, which is the key enzyme involved in nitrogen fixation has also been shown to be less prevalent in soils exposed to pesticides.¹¹ If N fixation is inhibited, then greater N applications will be required, and hence the probability of increased emissions of nitrous oxide or N₂O, a greenhouse gas 300 times more potent than carbon dioxide.¹²

Treatment of soils with three broad-spectrum fumigants – approximately 30 million pounds of which are applied to California soils each year – also contributes to significant greenhouse gas emissions. Fumigation with chloropicrin is associated with 7-100-fold N₂O increases,¹³ with the suggested mechanism being primarily from aerobic fungal processes rather than the commonly described anaerobic bacterial denitrification as the source of N₂O.¹⁴ Fumigation with the MITC fumigants alone (metam sodium and metam potassium), and in combination with chloropicrin,

⁸ Yardirn EN, Edwards CA. 1998. The effects of chemical pest, disease and weed management practices on the trophic structure of nematode populations in tomato agroecosystems. Applied Soil Ecology 7: 137–147; doi: https://doi.org/10.1016/S0929-1393(97)00036-X.

⁹ a. Casabé N, Piola L, Fuchs J, Oneto ML, Pamparato L, Basack S. 2007. Ecotoxicological assessment of the effects of glyphosate and chlorpyrifos in an Argentine soya field. Journal of Soils and Sediments 7:232–239; doi: <u>https://doi.org/10.1065/jss2007.04.224</u>.

b. Yasmin S, D'Souza D. 2010. Effects of Pesticides on the Growth and Reproduction of Earthworm: A Review. Applied and Environmental Soil Science 2010:1–9; doi: <u>https://doi.org/10.1155/2010/678360</u>.

¹⁰ The range of energy required for production of some common organic chemicals ranges from 10-70 gigajoules per tonne. While we do not know the precise amount of energy consumed per tonne in the production of fumigants, approximately 13,600 tonnes of fumigants are used every year in California. A central estimate of energy use per tonne of 35 gigajoules per tonne would indicate that fumigant production alone utilizes approximately 500,000 gigajoules of energy in California. [CITATION?]

¹¹ Martinez-Toledo MV, Salmeron V, Rodelas B, Pozo C, Gonzalez-Lopez J. 1998. Effects of the fungicide Captan on some functional groups of soil microflora. Applied Soil Ecology 7: 245–255; doi: https://doi.org/10.1016/S0929-1393(97)00026-7.

¹² Greenhouse Gas Emissions: Understanding Global Warming Potentials, United States Environmental Protection Agency, <u>https://www.epa.gov/ghgemissions/understanding-global-warming-potentials</u>

¹³ Spokas K, Wang D. 2003. Stimulation of nitrous oxide production resulted from soil fumigation with chloropicrin. Atmospheric Environment 37 (2003) 3501–3507. Spokas K, D Wang, Venterea. R. 2004. Greenhouse gas production and emission from a forest nursery soil following fumigation with chloropicrin and methyl isothiocyanate. Soil Biology & Biochemistry 37 (2005) 475–485.

¹⁴ Spokas K, Wang D, Venterea R, Sadowsky M. 2006. Mechanisms of N2O production following chloropicrin fumigation. Applied Soil Ecology 31 (2006) 101–109.

also increases N_2O emissions.¹⁵ Application of all three fumigants increased N_2O emission rates significantly when compared to non-fumigated controls, and the effects were still evident after 48 days, in contrast with fertilizer-induced N_2O emissions, which generally return to background within two weeks after application.¹⁶

Pesticide applications also inhibit the soil's ability to sequester carbon. Organic farming free of synthetic pesticides and fertilizers has been shown to result in higher stable¹⁷ soil organic carbon than even continuous no till conventional farming, as well as reduced nitrous oxide emissions.¹⁸ Highly diverse organic or similar pesticide-free cropping systems that include perennial cover crops, diversified crop rotations, organic amendments, no-till, and limited use of synthetic fertilizers and pesticides show the highest C sequestration potential, estimated at 600-1,000 lb SOC/ac-year in.¹⁹

We urge the Healthy Soils Program to incentive reduction of soil-harming and GHGproducing fumigants and incorporate an organic transition package

The soil biological community plays a fundamental role in nutrient cycling and soil and plant health. As such, any pesticide-mediated changes in organic matter decomposition and N and C transformations will likely also affect the use or release of N (including release of N₂O into the environment). It would be inappropriate to dismiss these detrimental impacts of synthetic pesticides on soil health. Studies from California and elsewhere have documented that even with routine tillage, organically-managed soils build more stable soil organic matter – increasing the soil's ability to sequester carbon – than continuous no-till conventionally-managed soils.²⁰

¹⁸ Sanders, J, Hess J (Eds), 2019. Leistungen des ökologischen Landbaus für Umwelt und Gesellschaft . Braunschweig: Johann Heinrich von Thünen-Institut, p. 364, Thünen Report 65. <u>https://www.thuenen.de/media/publikationen/thuenen-report/Thuenen_Report_65.pdf</u> This meta-analysis of 528 studies found that organically-managed soils had, on average, a 10% higher organic carbon content, a higher annual carbon sequestration rate of 256 kg C /ha, with 24% lower nitrous oxide emissions, resulting in a cumulative climate protection performance of 1,082 kg carbon equivalents per hectare per year.

¹⁵ Spokas K, D Wang, Venterea. R. 2004. Greenhouse gas production and emission from a forest nursery soil following fumigation with chloropicrin and methyl isothiocyanate. Soil Biology & Biochemistry 37 (2005) 475-485.

¹⁶ Id.

¹⁷ Most stabilized soil organic matter appears to derive from microbial processing of root exudates and other organic residues. Thus, the detrimental effect of agricultural chemicals on soil microbes undermines formation of stable soil organic matter. Paustian, K., Lehmann, J., Ogle, S., Reay, D., Robertson, G. P., & Smith, P. (2016). Climate-smart soils. Nature, 532(7597), 49-57. DOI:10.1038/nature17174. Kallenbach, Cynthia M., Frey, Serita D., & Grandy, A. Stuart. 2016. Direct evidence for microbial-derived soil organic matter formation and its ecophysiological controls. Nature Communications 7, Article number: 3630
<u>https://www.osti.gov/pages/servlets/purl/1363941</u>. A nationwide survey in the U.S. of 659 organic fields and 728 conventional fields showed 13% higher total SOM and 53% higher stable SOM in the organic soils. Ghabbour E, G. Davies G, Misiewicz T, Alami R, Askounis E, Cuozzo N, Filice A, Haskell J, Moy A, Roach A, and Shade J. 2017. National Comparison of the Total and Sequestered Organic Matter Contents of Conventional and Organic Farm Soils. Advances in Agronomy 146: 1-35. Greenhouse gas production and emission from a forest nursery soil following fumigation with chloropicrin and methyl isothiocyanate. Soil Biology & Biochemistry 37: 475–485.

¹⁹ Lal, R. 2016. *Beyond COP21: Potential challenges of the "4 per thousand" initiative*. J. Soil & Water Conserv. 71(1): 20A-25A.

²⁰ Most stabilized soil organic matter appears to derive from microbial processing of root exudates and other organic residues. Thus, the detrimental effect of agricultural chemicals on soil microbes undermines formation of stable

Reductions in soil fumigants, besides helping to keep soil resilient and ecologically diverse, will directly reduce emissions of potent greenhouse gases – a key goal of the Healthy Soils Program. We therefore strongly encourage the inclusion into the Healthy Soils Program of practices ranging from reduction in soil fumigants to organic transition as a means to protect the vital soil biological community from the negative impacts of synthetic pesticide use.

We believe adopting our recommendations will increase the impact of the Healthy Soils Program and help the program meet its full potential to support healthy soils.

Thank you for consideration of our input,

Margaret Reces

Margaret Reeves, PhD Senior Scientist Pesticide Action Network

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soil organic matter. Paustian, K., Lehmann, J., Ogle, S., Reay, D., Robertson, G. P., & Smith, P. (2016). Climatesmart soils. Nature, 532(7597), 49-57. DOI:10.1038/nature17174. Kallenbach, Cynthia M., Frey, Serita D., & Grandy, A. Stuart. 2016. Direct evidence for microbial-derived soil organic matter formation and its ecophysiological controls. Nature Communications 7, Article number: 3630 <u>https://www.osti.gov/pages/servlets/purl/1363941</u>. A nationwide survey in the U.S. of 659 organic fields and 728 conventional fields showed 13% higher total SOM and 53% higher stable SOM in the organic soils. Ghabbour E,

G. Davies G, Misiewicz T, Alami R, Askounis E, Cuozzo N, Filice A, Haskell J, Moy A, Roach A, and Shade J. 2017. National Comparison of the Total and Sequestered Organic Matter Contents of Conventional and Organic Farm Soils. Advances in Agronomy 146: 1-35.



California Department of Food and Agriculture Office of Environmental Farming and Innovation 1220 N Street Sacramento, CA 95814 October 23, 2019

Re: Healthy Soils Program Comments

Dear OEFI Staff,

The doubling of Healthy Soils Program (HSP) funding this year -- from \$15 M in FY18-19 to \$28 M in FY 19-20 -- is exciting! The investment reflects this administration's and the legislature's recognition that farmers and ranchers have a pivotal and positive role to play in solving the climate crisis. Moreover, this investment means that hundreds more farmers and ranchers will have the opportunity to receive financial assistance to transition to healthy soils practices, with all their agronomic and environmental benefits.

However, to ensure interested farmers and ranchers can successfully access this opportunity, a number of barriers to the program must be addressed. Without improvements such as those suggested below, we are concerned the program will be undersubscribed.

Four Most Frequently Indicated Barriers to Applying for the Healthy Soils Program

This spring, California Climate and Agriculture Network, American Farmland Trust, Carbon Cycle Institute and California Association of Resource Conservation Districts surveyed 30 technical assistance providers (TAPs) who had assisted farmers and ranchers in applying to HSP. According to their responses, the four most frequently indicated barriers that farmers and ranchers encounter in applying to the program are as follows:

- 1. Payment rates were too low (63% of respondents)
- 2. Application period was too short (58% of respondents)
- 3. Application was too complex (54% of respondents)
- 4. Inflexible rules/restrictions (50% of respondents)

We suggest prioritizing changes to the program based on this feedback from experts who work directly with farmers.

1. Payment Rates Were Too Low

We understand that CDFA is using the highest NRCS cost scenarios for every practice (except compost, which does not have an NRCS cost scenario). However, farmers and ranchers indicate payment rates for some practices are well below the true cost of implementing them. Combined with the high transaction costs resulting from a complex, time-consuming application and various implementation and reporting requirements, some farmers and ranchers and ranchers conclude that applying to HSP is simply "not worth the effort" because the benefit-to-cost ratio is too low. This is especially true for small acreage operations.

To improve the benefit-to-cost ratio for farmers and ranchers applying to HSP, we recommend the following changes:

- Offer applicants the option to develop their own budget (similar to SWEEP & AMMP)
- Establish a minimum annual payment for small farms (e.g. \$1,500 per year)
- Increase the maximum grant award (e.g. from \$75,000 to \$100,000)
- Gather data on the full costs of select practices and then update the payment rates

Offering applicants the option (as an alternative to, *not* in replacement of the current per-unit system) of developing their own project budget would still allow applications to be scored on their estimated GHG impact per acre, while giving farmers and ranchers more flexibility.

Establishing a minimum annual payment of \$1,500 – which NRCS's Conservation Stewardship Program began offering as a minimum annual payment in 2016 – would make the program more financially viable for very small farms.

Increasing the maximum grant award would have three benefits. First, it would increase the benefit of the program relative to the fixed application, implementation, and reporting costs. Second, it would enable farmers and ranchers to maximize practice implementation on a single APN (e.g. fully complete a hedgerow or riparian buffer), since they cannot apply to do the same practice on the same APN a second time. Third, it would increase the likelihood that the program will be fully subscribed.

Finally, we recommend gathering data from willing farmers and ranchers on the full costs of select practices – a task that CalCAN and others can assist with – and then update the payment

rates accordingly. We acknowledge such a process is unlikely to be completed before January, but should be feasible before the following solicitation.

2. Application Period Was Too Short

The previous round of HSP had an 8-week application period. This was an improvement on the first round's 6-week application period, yet 58 percent of TAP respondents in the survey indicated it was still too short. In the TAP survey, as well in past focus groups and interviews, TAPs consistently recommend a 12-week application period for HSP. We suggest the following timeline, which provides for a longer application period and complies with CDFA deadlines for encumbrance and liquidation¹ as per <u>AB 74</u> (the budget Act of 2019):

February-April: 12-week application period
May-June: 8-week application review and selection period
July-August: 8-week grant agreement completion period
September: Fall practice (e.g. cover crops, conservation plantings) implementation begins

3. Application Was Too Complex

Farmers, ranchers, and the TAPs who work with them have often expressed frustration with the length and complexity of the HSP application. CDFA's proposal to remove the essay questions from the application is an important improvement, but there is more that can be done to simplify the application for busy farmers and ranchers.

In the previous round, half the application (8 out of 16 pages, *not* including supporting documentation) consisted of questions to determine if an applicant's project provides benefits to a severely disadvantaged community² (SDAC) and/or Priority Populations,³ which are defined as residents of disadvantaged communities (DACs) or low-income census tracts. This section daunted and confused many applicants and TAPs, to the point that many told us they just gave up on answering them.

The SDAC and Priority Population determination should be removed from the application and instead handled by CDFA staff during the administrative review process, which would still allow CDFA to prioritize applications that meet the criteria. [*Note: We do not recommend changing the socially disadvantaged farmer/rancher question, which should stay in the application.*]

Based on a review of the <u>Benefit Criteria Table for Healthy Soils</u> and the <u>Healthy Soils Reporting</u> <u>Template</u> required by CARB, we believe CDFA staff can quickly make the SDAC and Priority Populations determinations for the vast majority of Healthy Soils projects during the

¹ Per AB 74, the deadline for encumbrance is June 30, 2021 and the deadline for liquidation is June 30, 2023.

² Defined as a community with a median household income less than 60 percent of the statewide average.

³ For more information, see the <u>California Climate Investments 2018 Funding Guidelines Benefit Criteria Table</u>.

administrative review process without asking applicants *any* of the determination questions included in the previous application.

The table on the right provides a basic overview of how this determination would work. Brian Shobe from CalCAN can provide additional documents explaining in more detail the step-by-step process CDFA staff would use and how it would meet CARB's requirements.

Making these changes would have multiple benefits. Shifting these determinations to the administrative review process would relieve farmers and ranchers, who often have limited broadband internet access and/or computer skills, from having to learn to use two different online mapping tools and answer and provide supporting documentation for a long list of confusing and often irrelevant questions. Simplifying the determination process would also relieve application reviewers from having to review so many different criteria and supporting documents.

Combined, these benefits may actually *increase* the number of applications qualifying for SDAC and Priority Population status, given

Overview of Proposed SDAC & Priority Population Determination Process

Step 1: Location

CDFA staff use existing mapping tools to determine if the applicant's street address and/or APN is located in an SDAC, DAC, or lowincome census tract.

Step 2: Address a Need – All HSP Projects Automatically Meet Criteria

All HSP practices address at least one of the common needs from <u>Funding Guidelines Table 5</u> (Criterion D). If needed, CDFA can provide CARB with a table of the common needs each practice meets and supporting references.

Step 3: Provide a Benefit – All HSP Projects with Practices that Reduce Air Pollution Automatically Meet Criteria

CDFA staff prepare a list of practices that reduce dust and air pollution (Criterion A). At least 10 practices, including the 2nd, 3rd, and 4th most popular, meet that criterion. If the project does *not* include any of those practices, CDFA staff send a two-question email to applicants to determine if they meet criteria B or C.

the anecdotal data about how many applicants have simply been deciding to forgo answering the Priority Population questions. Finally, these changes alone would remove one of the most intimidating and challenging portions of the application and cut the length of the application in half.

4. Inflexible Rules/Restrictions

Below are some of the inflexible rules/restrictions (in bold font) TAPs commonly cited as barriers in our recent survey, as well as some suggested solutions to address them:

APNs that have previously received HSP awards are not eligible, *even* if the applicant is applying for *different or new practices*

Solution: Allow farms to apply for different practices on previously awarded APNs

Ranchers are required to apply compost 3 years in a row on rangeland, which is costprohibitive and not in line with the studies conducted on rangeland compost Solution: Allow one-time compost applications on rangeland

The requirement for 120 farmer/rancher attendance at field days for demonstration projects

Solution: Reduce the demonstration project farmer/rancher attendance requirement, which is unrealistic for some regions. CDFA can survey 2017 demonstration projects to inform a new, more flexible requirement and identify ways to better support demonstration projects.

Other Comments:

Non-overlapping Practices

The proposed additions to the groups of non-overlapping practices make sense, but the way non-overlapping practices are described can be confusing. The RFP should clarify that non-overlapping practices *can* be in the same APN, just not on top of each other.

Urban Farms

The proposal to make urban farms ineligible for incentives grants is discriminatory. Hundreds of small farms, often operated by socially disadvantaged farmers and ranchers, exist within city limits in California (e.g. strawberry farms, southeast Asian vegetable farms, cut flower farms). We understand this was not CDFA's intent, so must be clarified. If CDFA's intent is to prevent *nonprofit, school and/or community gardens* from applying to the program, that can easily be achieved by replacing urban farms with a more precise description of what is ineligible.

Use of Soil Testing Data

During the HSP listening session on September 25, a participant asked OEFI staff how they plan to use soil testing data reported by HSP recipients. OEFI staff responded that they do not have a plan yet, but would welcome input on how to make it *public*. We are deeply troubled by this response because it indicates that CDFA – having required HSP awardees to take samples and report data for three years – has no plan for how to use it. As we have written multiple times, we strongly encourage CDFA to clarify the purpose and role of soil testing in the HSP program, recognizing that incentive projects are not controlled experiments and that farmers and ranchers doing the sampling are often not trained on scientifically rigorous sampling methods. Also, importantly, farmers and ranchers were never told their data would be made public. Releasing their data without notifying them ahead of time and obtaining their consent would be a significant breach of trust and privacy.

Organic Transition Package

Finally, we strongly support CCOF's proposal to add an organic transition package to HSP, as outlined in their letter to CDFA on August 29, 2019. CCOF offers a compelling rationale for the proposal in their letter. They point to research demonstrating that organically-managed soils build more soil organic matter, even with routine tillage, than conventionally managed soils. They also note that one of the biggest obstacles for producers interested in becoming certified organic is the required three-year transition, during which time producers take on the increased

costs of organic management but are unable to access the organic premium available to certified organic producers. Offering an organic transition package through Healthy Soils will attract more farmers and ranchers to the program and lower the economic barriers of transitioning to organic. Finally, certified organic producers are required by federal law to maintain or improve their soil organic matter and must use crop rotation, so assisting producers in transitioning to certified organic production will ensure they continue to use healthy soils practices long after the three-year HSP grant ends.

Thank you for the opportunity to comment. By incorporating the suggestions above, CDFA will ensure that all interested farmers and ranchers can successfully participate in this program and lead the country in making a transition to a climate smart agricultural system.

Sincerely,

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Jane Sooby Senior Outreach & Policy Specialist CCOF (California Certified Organic Farmers)

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