



27 August 2021

Public Comment for CDFA's Healthy Soils Initiative

Promoting Biomass Energy Conversion for Sustainable Agriculture

Conversion of California's electric power grid to renewables is well under way, but the agricultural sector is still significantly reliant on liquid carbon fuels for food production, processing, and distribution. Meanwhile, the state currently produces more than 54MT of waste biomass per year, representing an "emissions overhang" of organic material that threatens more immediate release methane and other greenhouse gases through burning and/or decomposition. Today, the volume of this waste is accelerating because of more determined public and private wildfire risk management strategies, while burning restrictions are increasing the biomass loads of state landfills.

Reconciling these emission and waste management challenges is currently being addressed by innovations in biomass energy conversion, including gasification, anerobic digestion, and other technologies being deployed at varying scale around the state. Historically, biomass energy has been dominated by large scale facilities, with very high logistical costs and persistent reliance on conventional fuel transport, but the latest emerging technologies are scalable to the enterprise/farm level where they can directly produce local biofuel, green electricity, and biochar for soil amendment (see e.g. <https://cariboubiofuels.com/>). Promoting these innovations will increase incentives for clean fuel substitution and healthier soils, reducing net emissions from vehicles, machinery, burning, and biomass decomposition.

We recommend that CDFA work with CARB to expand the use of carbon credits for these innovations within the state. Currently, California's credit program is subsidizing swine production in Missouri and cooking oil recycling in Singapore, among many other global mitigation activities. While these may have comparable impacts on global warming risk, they do not address the local air quality and livelihoods challenges that biomass waste and fossil fuel use present across California's own agricultural communities, including some of our most economically disadvantaged and health vulnerable populations. In addition to its essential contributions to state food security, income, and employment, biomass energy can make agriculture a full partner in California's climate leadership.



Promoting Biochar to Advance California's Climate Goals

Biochar is well known for its many contributions to soil health, including a variety of ecosystem services such as water retention, supporting biodiversity, and increasing productivity of the state's essential agricultural sector. Less recognized is its potential to contribute to long-term carbon sequestration, particularly through stabilization of waste biomass that would otherwise be burnt or decompose into methane and other greenhouse gas emissions. It is essential for leading state agencies, including CDFA and CARB, to recognize biochar's mitigation potential for several reasons:

1. Biochar is charcoal made from biomass. In soil, biochar increases nutrient retention, supports microbial functions and enhances water availability. Biochar is found in soils around the world as a result of both natural vegetation fires and historic soil management practices like those of the indigenous Amazonians who created the black soils known as Terra Preta. Modern biochar production promises additional benefits in the form of increased carbon sequestration and co-production of renewable energy. Energy can be captured in the form of oil and/or gas released by the biochar production process.
2. The carbon in biochar resists degradation and remains in soils for hundreds to thousands of years. Because this carbon came from biomass that would otherwise have decomposed into greenhouse gasses within a few years, biochar is a carbon sequestration method with many side benefits. Added to soils, compost piles, and other wastes, biochar can also reduce emissions of nitrous oxide and methane, two potent greenhouse gasses.
3. California currently produces more than 54MT of waste biomass per year, representing an "emissions overhang" of organic material that threatens more immediate release of methane and other greenhouse gases through burning and/or decomposition. Today, the volume of this waste is accelerating because of more determined public and private wildfire risk management strategies, while burning restrictions are increasing the biomass loads of state landfills.



Caribou Biofuels

Biochar needs to be officially recognized and incentivized for its mitigation potential. This will increase incentives to use biochar for healthier soils, reduce emissions from burning and biomass decomposition, and promote innovation to develop more stable and carbon-retentive biochar. We recommend that CDFA work with CARB to develop a certification program that grades biochar for sequestration potential, rewarding innovation for sustained food security, habitat, and lasting, nature-based climate solutions.

Thank you for your consideration.

Respectfully,

Kieran Mitchell, CEO

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August 27, 2021

California Department of Food and Agriculture - CDFA
Office of Environmental Farming & Innovation
1220 N St., Sacramento, CA 95814

**RE: CDFA Healthy Soils Program (HSP) New Management Practices Proposals
Recommendations Formal Comments**

Dear Office of Environmental Farming & Innovation:

The California Walnut Commission (CWC) welcomes the opportunity to comment on the draft recommendations of the CDFA Healthy Soils Program (HSP) new management practices proposals recommendations, and the program as a whole. The CWC represents the California walnut industry, comprised of nearly 4,500 family farms that generate over 85,000 jobs directly and indirectly, and over \$1.29 billion in farm gate product value. Walnuts are California's ninth largest agricultural commodity and 99% of English walnuts grown in the United States are produced in California.

The CWC is anticipative our responses to the new management practices proposal recommendations will help provide a targeted framework with the purpose of best enabling direction and management of future projects, further ensuring a positive impact on how the program can be of best value to walnut growers across the state.

The CWC believes HSP is doing a decent job, being flexible with the type of project CDFA is willing to fund. Also, with HSP funding 646 projects totaling \$41.52 million in grant funds over the years, that is a good start, but believe there is an even greater impact opportunity for growers across the state. The CWC would like to see the statistics associated with the funding to include the following: what type of farm, operation size, crop type, and measurable progress. This could be provided to all participating farms and to the public to encourage contribution to the soil health practices across the state.

One of the largest challenges that growers will have in the future is the continued increase of regulatory constraints and costs across the state. This will continue to force growers to use expensive technology to further implement sustainable farming practices, increase frequencies of already current rigorous regulatory requirements and put an additional burden on growers presently operating in some of the most stringent regulatory requirements in the world. A lot of growers will not have the overflow of resources or the money to make the required improvements without practical solutions and funding support. For example, using technology for the farm and for the environment's benefit is essential for all growers in the state of California; however, converting to further climate positive, on-farm soil management practices have costs associated with them. In

supporting those costs, continued availability of funding from HSP grants and additional incentive based programs will help these growers with the implementation of the new practices and continue to build off of the already environmentally friendly and sustainable practices going on at a farm level.

The CWC believes one of the biggest barriers to growers using the program is awareness, and also the apathy to dealing with government paperwork. Potential participants need better assistance and direction to know what to do to actually take advantage of the program. A suggestion to improve involvement is greater transparency through electronic communication, webinars, interactive workshops, learning sessions and a more open forum for discussion and communication across the agriculture community.

Inclusivity and equitability across all farm sizes throughout the state is another critical component. Having HSP as a resource for funding will continue to be crucial to enable growers to achieve the benefits of healthy soils, supporting wildlife habitats, improving plant health and yields, reducing greenhouse gases and sequestering soil carbon, reducing soil erosion and on-farm dust, improving water and air quality, and increasing soil water-holding capacity.

Further, in reviewing the new management practices proposals recommendations put forth by the CDFA, it is clear that the practices proposed are going to be important for the continued sustainability of the industry and the environment. Moreover, specifically to walnuts, the CWC would like to see an enhanced focus on the potential of whole orchard recycling (WOR) through research funding, while also providing growers funding to offset the costs associated with it. Whole orchard recycling is a practice which consists of the chipping of woody perennial crops at the end of their agronomic life cycle. The wood chips are incorporated into the soil of the fields where the trees stood, which may be fallowed or continue agronomic production under minimum-tilled perennial crops.

It is increasingly important as an alternative to burning, which in the San Joaquin Valley, Ag burning will be phased out by January 1, 2025. Whole orchard recycling also has the potential to build soil organic carbon and microbial biomass, which improves soil health, nutrient levels, and structure and water retention. It has also been shown to boost tree growth and yields over time (in almonds). Whole orchard recycling funding and incentives are imperative for the continued success of the walnut industry. Technological advancements and innovations designed to further help the farm and adhering to the suggestions from the list provided by the CDFA and above, will help enable more climate positive, efficient, effective, sustainable systems and solutions for the agricultural industry.

The CWC greatly appreciates the opportunity to comment on this important matter impacting the walnut industry and looks forward to the continued engagement throughout the process.

Sincerely,

Joshua Rahm

Joshua Rahm

Director, Technical & Regulatory Affairs, California Walnut Commission
jrahm@walnuts.org

From: Kim Mattson <mattsokim@gmail.com>
Sent: Monday, August 23, 2021 1:10 PM
To: CDFA Healthy Soil Program_Technician@CDFA
Subject: Comments on CDFA Healthy Soils Program recommendations for new proposals

CAUTION : [External Email] - This email originated from outside of our CDFA organization. Do not click links or open attachments unless you recognize the sender and know the content is expected and is safe.

Dear CDFA HSP:

I read your program for promoting California agriculture healthy soils and carbon sequestration with interest.

I have a few general comments to contribute per your request for public comments on the new practices proposals. As background, CDFA appears to be requesting comments on new areas for agricultural management practices that CDFA may fund in future HSP grant programs.

In reviewing the four page description of newly proposed practices, I could see most proposals addressed some sort of additions of organic matter to soils. These included biochar, food waste, humates, compost, and manure. The first proposal was different in that it proposed an activity to increase flooding in delta agriculture systems as a way to reduce GHG emissions from peat soils.

The comments by technical sub-committee appeared to accept the flooding of peat soils and the additions of biochar and food wastes. The sub-committee did not recommend the other types of organic matter additions as these submissions did not appear to be well developed and not supported by scientific studies or the proposals did not meet the guidelines.

The additional comments and explanations of the sub-committee appeared to be thoughtful and reasonable.

I think additions of organic matter in general to soils should be encouraged and investigated as you are doing. There is fairly abundant literature on build up of soil C with manure from places such as Rothamsted and site specific paired studies or even Hugelkultur). Also soil C models incorporate a surface applied C as a source to underlying soil C using some sort of proxy (clay content or perhaps C:N or lignin). It is interesting to me that the conventional wisdom seems to think root inputs are more important than surface sources for soil C buildup and maintenance.

One problem you may encounter is the trouble with documenting a meaningful or significant soil C increase over short period of time. I wondered if you may fund projects doing the right thing but not be able to demonstrate that the projects actually sequestered carbon. I think you will need to rely on models and long term studies as surrogates. You may be able to document best management practices but not actual effects of increased soil C. You may need to think about ways to show some indications of increased Cmaybe movement of mean values but not yet statistical significance and that are in the direction of what models forecast.

You may have already accepted that surface additions of some sort or any sort of organic matter will naturally have some positive effect on soil C. But I think this is not universally accepted. And I think the effects on soil C depend on the type of application and the material applied.

I have read in some literature that roots may supply nearly all the soil C. This belief seems to come from studies that add organic matter to the soil surface and then fail to detect a soil response. In my opinion, these studies may suffer from type II statistical errors, or may not have a long enough period of study, or other design problems. I personally

think roots perhaps supply 2/3rds and surface sources provide 1/3 to soil C. Roots are more difficult to manage than surface applications so surface applications make sense. But one thing about surface applications is the cost that may make them impractical. I would suggest you consider costs and promote natural processes such as litter or residue management (or as the first project, flooding). Maybe consider burning or charring the crop residue to create a more resistant form of organic matter. These types of practices can be applied over much larger areas than an intentional application such as biochar or food wastes, or compost and at a more reasonable cost. The type of material being applied will likely be important as to the longevity of the soil C it creates. So, I would also suggest you consider that soil applications such as food waste would probably not last very long nor produce very much soil C whereas biochar or compost or certain types of residue would likely produce more and longer lasting soil C.

Thanks for considering my comments and feel free to contact me if you are interested in further discussions.

Kim Mattson
Ph.D. Ecologist and owner Ecosystems Northwest
Mount Shasta, CA
<http://www.EcosystemsNorthwest.com>

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Mulligan, Kathryn@CDFA

From: LA Plant <laplantgenetics@gmail.com>
Sent: Friday, July 30, 2021 2:58 PM
To: CDFA Healthy Soil Program_Technician@CDFA
Subject: New healthy soil method for urban agriculture

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I would like to suggest including funding for soil free organic carbon synthesis in the healthy soils program. This is important for urban areas with contaminated soil and/or existing impervious cover such as concrete or asphalt. Basically the method involves artificial soil synthesis using a variety of urban waste materials to quickly generate a synthetic soil-like material that can be used for crop production and carbon sequestration.

It is not composting as it involves crop production throughout the entire soil synthesis process. I can send samples of the material produced for analysis. Unlike soil-based carbon sequestration methods, it is possible to extract and quantify soil organic carbon (SOC) at the end of the crop production cycle. Undigested substrate can be further processed into additional SOC in the next crop production cycle, allowing regular extraction of SOC from the system on a continuous basis. The SOC produced is not flammable and appears to be fairly stable.

Unfortunately, as this is a soil free method for production of SOC, it is hard to find where it fits in the current paradigm. It definitely produces healthy soil, just not in a conventional manner. So maybe it can be included as a novel method for production of healthy soil in your program. Please feel free to get in touch if you need additional details. As far as I am aware, my company is currently the only entity capable of carrying out this synthesis process. It was not an easy process to develop.

Thank you for your consideration!

H. Smith
LA Plant Genetics

From: Jessa Kay Cruz <jessa.kay-cruz@xerces.org>
Sent: Friday, July 30, 2021 11:05 AM
To: CDFA Healthy Soil Program_Technician@CDFA
Subject: HSP recommended practices

CAUTION : [External Email] - This email originated from outside of our CDFA organization. Do not click links or open attachments unless you recognize the sender and know the content is expected and is safe.

To Whom it May Concern,

In response to the email sent out with the following info:

'CDFA staff recommendations for practices for potential inclusion under HSP are now available for public comments through August 27, 2021' I would like to offer the following suggestions for adding practices to the HSP program:

Grazing lands:

Riparian herbaceous cover - this practice appears in the cropland list, but not under grazing lands. This is a practice that our NRCS partner biologists use frequently for pollinator conservation work in rangelands

Conservation Cover - this practice appears in the cropland list, but not under grazing lands. This is another practice that our NRCS partner biologists use frequently for pollinator conservation work in rangelands

Cropland:

Vegetative Drift Barrier - this is not yet an NRCS practice, so I'm not sure if you can incorporate it. This practice protects wildlife habitat from pesticide drift by creating a vegetative barrier of non-wildlife friendly vegetation to catch drift particles. It is especially effective in protecting pollinator habitat in croplands where adequate spatial buffers are not available.

Upland Wildlife Habitat Management for Pollinators - This is a [new specification](#) for a CA NRCS practice, intended to incentivize producers to maintain existing high-quality habitat and to adopt and maintain management practices that decrease negative impacts to pollinators and other wildlife (eg. pesticide risk reduction).

Please feel free to reach out to me directly if you have any questions or would like clarification on any of these comments. Thank you for the opportunity to provide input.

Sincerely,

Jessa Kay Cruz

Senior Pollinator Conservation Specialist

Pronouns: she/her/hers



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