CDFA RECOMMENDATIONS ON 2024 HEALTHY SOILS PROGRAM NEW PRACTICE PROPOSALS

cdfa
The Office of
Agricultural Resilience
& SUSTAINABILITY

Environmental Farming Act
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OUTLINE

- Background: HSP New Practice Proposals received from 2024 public RFP
- CDFA Recommendations on 2024 HSP New Practices
- Introduction of 3 practices recommended for HSP Incentive Grants
  - Biochar Application (currently in HSP Demo Research Grants)
  - Prescribed Indigenous Burning (New, from 2024 round)
  - Re-Saturating Delta Peat Soils through Rice Cultivation (currently in HSP Demo Research Grants)

BACKGROUND

- CDFA received 16 proposals during 2024 solicitation period for total 13 practices.
- Each practice/proposal was reviewed by the HSP New Practice Review Subcommittee consisting of UC/CSU and NRCS subject matter experts.
- The review included ten criteria focused on:
  - Currently available scientific research with field trials, preferably in CA or similar climate
  - Improvement in soil health and carbon sequestration
  - Benefits in GHG emission reductions
  - Benefits in crop production
  - Co-benefits
  - Applicability to California climate and agricultural systems
  - Limitations, restrictions and/or adverse environmental impacts

CDFA Recommendation Summary

Recommendations (Five Categories)	Practices Proposed
1. Inclusion in HSP Incentive Grants (CDFA and CARB to develop implementation guidelines and QM on GHG emission reductions)	• Biochar Application • Prescribed Indigenous Burning
2. Inclusion in HSP Demo Type A Research Grants	• Grazing of Orchards
3. No further recommendation Remain in HSP Demo Type A Research Grants	• Food Hydrolysate Soil Applications • Mycorrhizae Application • Vermicompost Application
4. No further recommendation Remain in HSP Incentive Grants	• Pasture and Hay Planting
5. Not recommended for inclusion in HSP	• Application of Live-Native Microalgae • Carbonic Acid Application in Orchard/Vineyard • Microbial/enzymatic degradation of microplastics • Occultation/Tarping + No-till on small-size farms (<10 ac) • Organic Management • Development of irrigation and nutrient management plans

RECOMMENDED FOR HSP INCENTIVE GRANTS

- Biochar Application
- Prescribed Indigenous Burning
- Re-Saturating Delta Peat Soils through Rice Cultivation

BIOCHAR APPLICATION

Definition: Biochar is black carbon produced from heating biomass (wood chips, plant residues, manure etc.) in a low-oxygen environment. It is used as a soil amendment to sequester carbon and improve soil health.

Considerations:

- Robust field studies and model simulations show benefits on GHG emission reduction and C sequestration in CA and other Mediterranean climate regions.
- Biochar application could have a substantial impact on GHG emission reductions for vineyards and orchards, particularly in soils with very low organic matter.
- Two projects funded by HSP Demo Research Grants: complete by Mar 2026
- Specific requirements: biochar quality, implementation method, and soil types.

Next steps: consult with USDA, United States Biochar Initiative (USBI), United States Biochar Coalition (USBC), CDFA Fertilizing Materials Inspection Program, biochar producers and other stakeholders to

- Define eligible agricultural system(s), crop types and soil/land types
- Develop biochar quality standards
- Develop implementation standards
- Study payment scenarios

PRESCRIBED INDIGENOUS BURNING

Definition: The intentional application of smaller, controlled fires to tribal lands to provide desired cultural services, promote biodiversity and reduce wildfire hazards.

Considerations:

- Field studies on PIB reported increases in soil organic matter, moisture retention and decreased bulk density.
- The benefits of GHG emission reductions are through the avoidance of large and intense wildfires.
- Co-benefits: PIB controls pests, promotes biodiversity, and increase productivity and growth of culturally important plants.
- Eligible lands: Tribal lands.
- Specific requirements: PIB plan, burning permit, timing of implementation, qualified individuals capable of performing the tasks, landowner permission.

Next steps: Begin Tribal consultation process; consult with NRCS, CARB, CalFire, UC and other entities with experiences.

- Define eligible lands
- Develop implementation standards and requirements
- Develop quantitative methodology for estimation of GHG emission reduction benefits
- Study payment scenarios

RE-SATURATING DELTA PEAT SOILS THROUGH RICE CULTIVATION

Definition: conversion of land within the Sacramento-San Joaquin Delta region that is currently used for annual, non-rice agriculture to rice-only cultivation.

Considerations:

- 2021 recommended to Incentive Grants initially, moved back to Demo Research Grants due to lack of data on modeling, now ready for HSP Incentive Grants

Next steps:

- Define eligibility area based and set GHG emission reduction estimates from literature review and environmental spatial data
- Develop implementation standards
- Study payment scenarios

Recommended for Inclusion in Research Demonstration Grants

Grazing in Orchards

Definition: Use of livestock (sheep or goats) to manage understory vegetation in orchards

Considerations:

- Studies have shown this practice increases carbon sequestration and soil health, but direct impacts of GHG emission reductions may be limited.
- Field trials are limited to vineyards.
- The practice may have potential to increase crop yield, but negative impacts on vineyard yields in the short term were reported.
- Specific requirements: Active management is required for food safety and other concerns. We will consult with CDFA food safety program for guidelines to be included in the program.

Recommended to Remain in Demonstration Research Grants

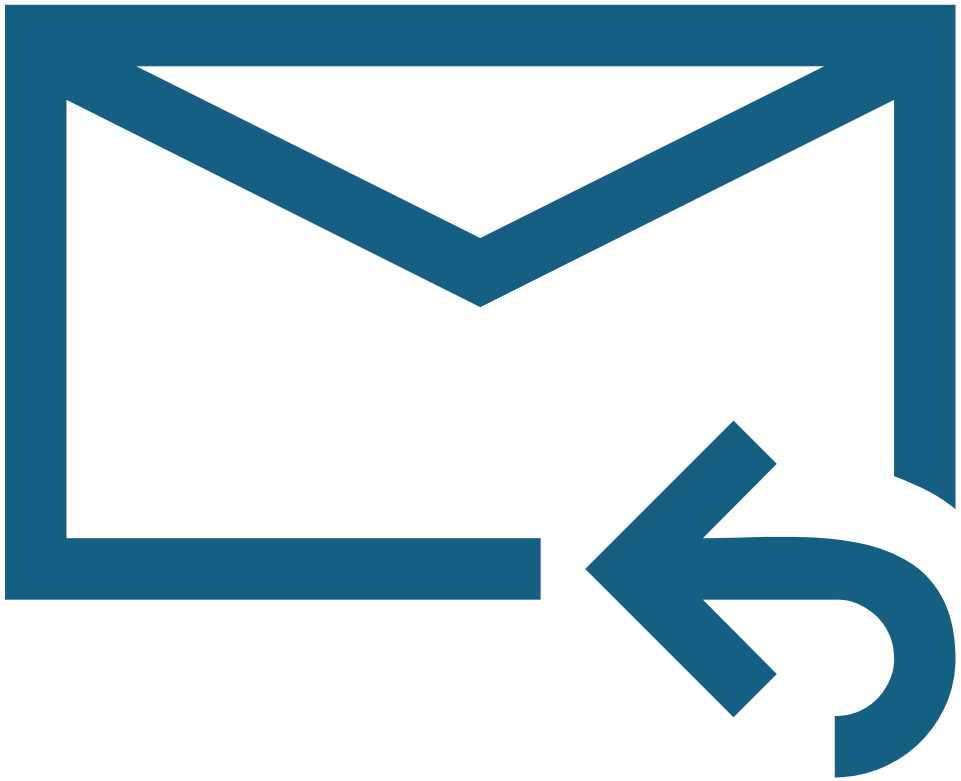
Proposed Practice	Brief description of proposed practice	Additional Considerations and Explanations
Food Hydrolysate Soil Applications	Application of food waste hydrolysates through the irrigation system	• Literature shows this practice benefits crop productivity and quality, nutrient use efficiency, and soil health, but no field studies are available regarding its impact on C sequestration and GHG emissions. • A few California-specific studies are available but mostly for proprietary products. • One project funded by HSP Demo Grants: on-going.
Mycorrhizae Application	Inoculation of arbuscular mycorrhizal fungi at planting or adding water-soluble fungi through irrigation to form a symbiotic relationship with crop roots	• Available studies focused on crop benefits such as enhancing water and P uptake and mitigating drought water stress. • Majority studies are greenhouse/lab basis. Successful inoculation and survival at field scale are largely unknown. Broad implementation guidance is not available. • Limited field studies reported inconclusive results in GHG emission reductions.
Vermicompost Application	Use of vermicompost to croplands	• Two projects funded by HSP Demo grants, both recommend more studies are needed. (1) Compost vs. vermicompost in vineyard: increase in SOM with application rate; tended to increase crop yields. (2) Dairy vs. food waste vermicompost in orchard and row crop: increase in SOM with application rate; increase in soil water infiltration. • CDFA will do further literature review to compare the differences with regular compost and to determine how to define vermicompost. We currently support vermicompost made from certified compost at the normal compost payment rate.

Not Recommended for Inclusion in HSP

Proposed Practice	Brief description of proposed practice	Additional Considerations and Explanations
Application of Live-Native Microalgae	To isolate, grow, and feed micro algae through micro irrigation systems in pistachio orchards	• The use of native algae has been studied only for bioremediation trials and are laboratory, pot and greenhouse based. • No data shows reductions of GHG emissions or increase in carbon sequestration. • Concerns: (1) dry soil conditions in CA may limit growth of the algae after application (2) Application through drip irrigation may clog drip emitters and increase production cost.
Carbonic Acid Application in Orchards and Vineyards	Injection of carbonic acid into irrigation water to reduce pH of the irrigation water	• It is not a soil health practice. "Implementing soil health management leads to increased organic matter, more diverse soil organisms, reduced soil compaction and improved nutrient storage and cycling." Soil Health - USDA NRCS
Microbial/ enzymatic degradation of microplastics in soils	Use of a proprietary microbe (X-32) to produce enzymes that break down microplastics in soils	• The HSP does not support proprietary products.

Not Recommended for Inclusion in HSP

Proposed Practice	Brief description of proposed practice	Additional Considerations and Explanations
Occultation/ Tarping + No-till on small-scale farms (<10 acres)	Covering soil with black tarp	• Two practices proposed: No-Till and Black Tarp. No-Till is an eligible HSP practice. • Black tarp has potential to increase crop yield through reducing weed pressure and conserving soil moisture. Mulching with wood chips / natural materials in HSP provides similar benefits without any negative impacts. • Concerns: (1) Introduction of plastic to soils will negatively impact soil health. (2) Use of black tarp has potential to increase N_2O emissions.
Organic Management	Systems management approach with a series of practices	• A group of practices (crop rotation, cover crops, organic amendments, integrated pest management, etc.), most of which are already included in the program. • The combination of practices vary, depending on crop type and other environmental factors, which would complicate model estimation of GHG emission reduction benefits.
Development of irrigation and nutrient management plans	Develop nutrient and irrigation management guidelines to accompany healthy soil management practices	• It is not a soil health practice but development of plans. • Nutrient management is already an eligible practice included in the HSP.



Please send your feedback to

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Thanks,

The Healthy Soils Program Team