Build Healthy Soils
Through Returning Agricultural Waste To Soils

2017 Central Valley Summit – Alternatives on Open Burning of Ag Waste

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The Office of Environmental Farming and Innovation

cdfa CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

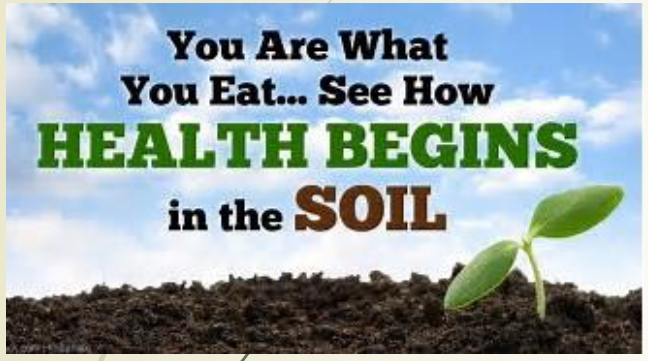
Outline

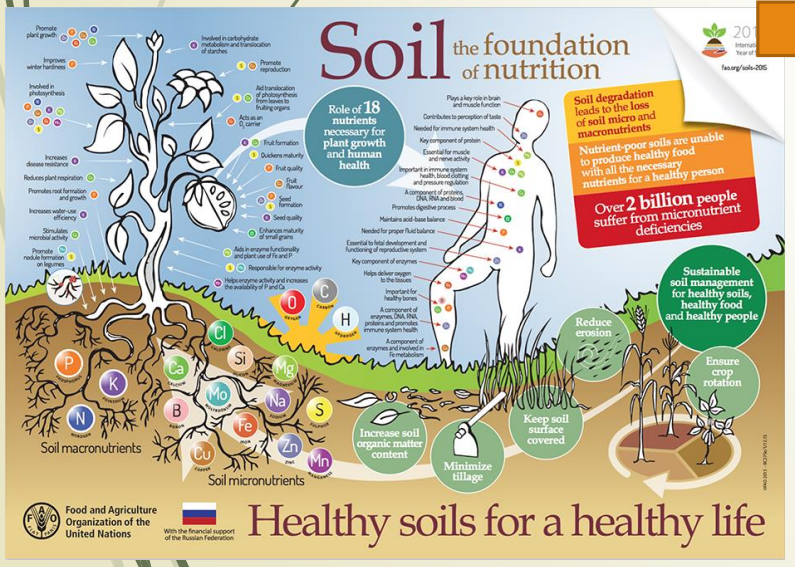
- **Why Soil Health Is Important?**
  - Soil and Soil Health
  - Importance of Soil Organic matter
- **What Funding Opportunity Is Available?**
  - CDFA Healthy Soils Program (HSP) Incentives Program
  - Eligible HSP Practices
- **How to Apply: Application Process for the HSP Incentives Program**
- **HSP Current Status**
  - 2017 Application Summary
  - Future Funding Sources

Soil and Soil Health

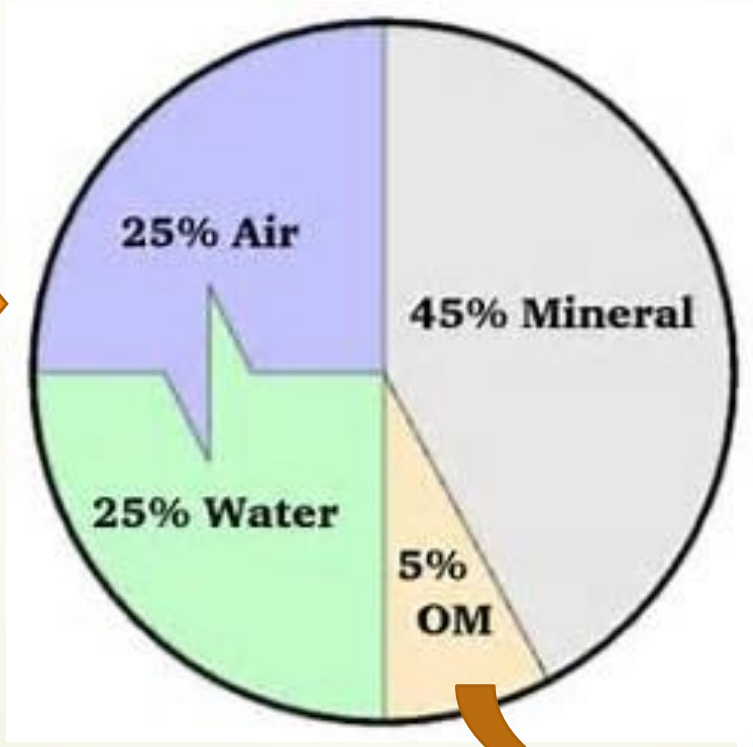
- Soil: a living and life-giving natural resource
- Soil Functions:
  - ✓ Physical stability and support
  - ✓ Regulating water: controlling, infiltration and retention
  - ✓ Cycling nutrients
  - ✓ Filtering and buffering potential pollutants
  - ✓ Sustaining plants and animal life
- **Soil Health**: the **continued capacity** of soil to function as a vital living ecosystem that **sustains** plants, animals, and humans.

Soil Composition





Ideal soil condition by volume



Soil organic matter composition

Importance of Soil Organic Matter

Increasing soil organic matter

- Improves **soil structure**
  - better workability & crop establishment
- Increases **water infiltration and retention**
  - Higher water holding capacity, less draught stress
- Improves **soil fertility**
  - Returning nutrients to soils (P, K, S, N, etc.)
  - Increasing soil nutrient holding capacity
- Increases **soil microbial activity and biodiversity**
  - Lower pest and disease damages to crops

Improving Soil Health

Increasing in soil health

- Healthy crops → Higher yields = Better revenue
- Lower your water and energy bill
- Reduce cost on fertilizer input
- Reduce cost on pesticide/herbicide input
- Cleaner Air and Water → healthy environment and happy life
  - Less dust
  - Less soil erosion

Benefits to Agricultural Operations

Healthier Soils → Sustainable Farming and Greater Profitability

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About the Healthy Soils Program

- **New program -** stems from the California Healthy Soils Initiative, a collaboration of state agencies and departments that promotes the development of healthy soils on California's farmlands and ranchlands.

- **The objectives** are to build soil organic carbon and reduce atmospheric greenhouse gases (GHGs) by
  1) Providing financial incentives to California growers and ranchers for agricultural management practices that sequester carbon, reduce atmospheric GHGs and improve soil health;
  2) Funding on-farm demonstration projects that showcase conservation management practices that mitigate GHG emissions and increase soil health;
  3) Creating a platform promoting widespread adoption of conservation management practices throughout the state.
- **2017 HSP is Funded by the Greenhouse Gas Reduction Fund (GGRF).**
  - HSP Incentives Program - $3.75 Million available (Obj. 1)
  - HSP Demonstration Projects - $3 Million available (Obj. 2 & 3)

2017 HSP Eligible Agricultural Management Practices

- **Soil Management Practices**
  - Cropland Management Practices
  - Compost Application Practices
- **Cropland to Herbaceous Cover Practices**
- **Establishment of Woody Cover Practices**
  - Woody Plantings Practices
  - Grazing Lands Practices

2017 HSP – Soil Management Practices

- **Cropland Management Practices**

  Must follow USDA NRCS conservation practice standards and associated site specific requirements during implementation.

Practices returning agricultural waste to soils

- ✓ **Mulching** (USDA NRCS CPS 484)
- ✓ **Residue and Tillage Management – No-Till** (USDA NRCS CPS 329)
- ✓ **Residue and Tillage Management – Reduced Till** (USDA NRCS CPS 345)
- ✓ Cover crops (USDA NRCS CPS 340)

Mulching

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

MULCHING

(Ac.)

CODE 484

DEFINITION

Applying plant residues or other suitable materials produced off site, to the land surface.

PURPOSE

This practice supports one or more of the following purposes:

- Conserve soil moisture – Resource concern (INSUFFICIENT WATER –Inefficient moisture management).
- Reduce energy use associated with irrigation – Resource concern (INEFFICIENT ENERGY USE – Farming/ranching practices and field operations and INSUFFICIENT WATER – Inefficient moisture management).
- Provide erosion control – Resource concern (SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels, and/or SOIL EROSION – Concentrated flow erosion, and/or SOIL EROSION - Sheet, rill, & wind erosion).
- Facilitate the establishment of vegetative cover – Resource concern (DEGRADED PLANT CONDITION – Undesirable plant productivity and health).
- Improve soil health – Resource concern (SOIL QUALITY DEGRADATION –Organic matter depletion).
- Reduce airborne particulates – Resource concern (AIR QUALITY IMPACTS - Emissions of Particulate Matter - PM - and PM Precursors).

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all lands where mulches are needed. This practice may be used alone or in combination with other practices.

CRITERIA

General Criteria Applicable to All Purposes

Mulch materials are natural or artificial materials that have sufficient dimension (depth or thickness) and durability to achieve the intended purpose for the required time period.

Prior to mulching, prepare the soil surface to facilitate the desired purpose.

Evenly apply the mulch material to the soil, and if necessary, use tackifiers, emulsions, pinning, netting, crimping or other acceptable methods of anchoring to hold the mulch in place.

In cases where excessive furrow erosion may occur due to concentrated flows from plastic mulches, take appropriate measures to protect the furrows.

Apply manufactured mulches according to the manufacturer's specifications.

Additional Criteria to Conserve Soil Moisture and/or Reduce Energy Use Associated with Irrigation

To reduce evaporation, 100 percent of the treated surface area must be covered.

Additional Criteria to Provide Erosion Control and to Reduce Airborne Particulates

When mulching with straw or grass hay, apply at a rate to achieve 70 to 100 percent ground cover.

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service State Office or visit the Field Office Technical Guide.

NRCS, CA
Sept. 2015

Residue and Tillage Management – No-Till

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

RESIDUE AND TILLAGE MANAGEMENT NO TILL / STRIP TILL / DIRECT SEED

(Ac.)

CODE 329

DEFINITION

Managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round, limiting soil-disturbing activities to those necessary to place nutrients, condition residue and plant crops.

PURPOSE

- Reduce sheet/rill erosion.
- Reduce wind erosion and Particulate matter less than 10 micrometers in diameter - PM 10.
- Reduce tillage-induced particulate emissions
- Improve soil organic matter content.
- Reduce CO_2 losses from the soil.
- Reduce energy use.
- Increase plant-available moisture.
- Provide food and escape cover for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland and other land where crops are planted.

This practice includes planting methods commonly referred to as no-till, strip till, direct seed, zero till, slot till or zone till. Approved implements are: no-till and strip-till planters; certain drills and air seeders; strip-type fertilizer and manure injectors and applicators; in-row chisels; and similar implements that only disturb strips and slots. All others are considered to be full-width or capable of full disturbance and therefore not compatible.

CRITERIA

General Criteria Applicable to All Purposes

Residue shall not be burned.

All residues shall be uniformly distributed over the entire field.

No full-width tillage shall be performed regardless of the depth of the tillage operation.

The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous crop and harvest or termination of the current crop (includes fallow periods). The STIR value shall be no greater than 30.

Additional Criteria to Reduce Sheet/Rill Erosion; Reduce Wind Erosion and Particulate matter less than 10 micrometers in diameter - PM 10

The amount and orientation of surface residue needed and the amount of surface soil disturbance allowed to reduce erosion to the planned soil loss objective shall be determined using the current approved water and/or wind erosion prediction technology. Calculations shall account for the effects of other practices in the management system.

Additional Criteria to Reduce Tillage-Induced Particulate Emissions

Reduce or modify tillage operations that create dust, especially during critical air quality periods.

Adopt tillage practices that reduce trips across the field. Utilize tillage equipment that has proven to reduce particulate matter emissions.

Other operations to reduce dust shall be performed when specified on the Practice Requirement Sheet.

Residue and Tillage Management – Reduced Till

Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

RESIDUE AND TILLAGE MANAGEMENT, REDUCED TILL

Code 345

(Ac)

DEFINITION

Managing the amount, orientation, and distribution of crop and other plant residue on the soil surface year-round while limiting soil-disturbing activities used to grow and harvest crops in systems where the field surface is tilled prior to planting.

PURPOSE (resource concern)

- Reduce sheet, rill, and wind erosion and excessive sediment in surface waters (soil erosion).
- Reduce tillage-induced particulate emissions (air quality impact).
- Improve soil health and maintain or increase organic matter content (soil quality degradation).
- Reduce energy use (inefficient energy use).

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland.

CRITERIA

General Criteria Applicable to All Purposes

This practice includes tillage methods commonly referred to as mulch tillage or conservation tillage where the entire soil surface may be disturbed by tillage operations such as chisel plowing, field cultivating, tandem disking, or vertical tillage. It also includes tillage/planting systems with few tillage operations (e.g., ridge till) but which do not meet the soil tillage intensity rating (STIR) criteria for conservation practice Residue and Tillage Management, No Till (Code 329).

Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

Do not burn residues, except for a light-to-moderate burn of sugarcane residue after harvest (as described in the wind and water erosion operations database).

The STIR value shall include all soil disturbance field operations that are performed during the crop interval (i.e., from the time immediately following harvest or termination of one cash crop through harvest or termination of the next cash crop in the rotation, including fallow periods). The crop interval STIR value rating shall be no greater than 80, and no primary inversion tillage implements (e.g., moldboard plow) shall be used.

2017 HSP Incentives Program Payment Rates

Cropland Management Practices	Practice implementation Name (COMET – Planner)	Practice Requirement	Scenario Name	Payment Unit	Payment Rate ($)
Cover Crop (CPS 340)	Add Non-Legume Seasonal Cover Crop to Irrigated Cropland		General purpose	**Ac**	**123.82**
Mulching (CPS 484)	Add High Carbon Mulch to Croplands		Natural materials	**Ac**	**376.56**
Residue and Tillage Management - No-till (CPS 329)	Intensive Till to No Till or Strip Till on Irrigated Cropland		No-till	**Ac**	**29.40**
Residue and Tillage Management - Reduced-till (CPS 345)	Intensive Till to No Till or Strip Till on Irrigated Cropland		High residue	**Ac**	**31.24**

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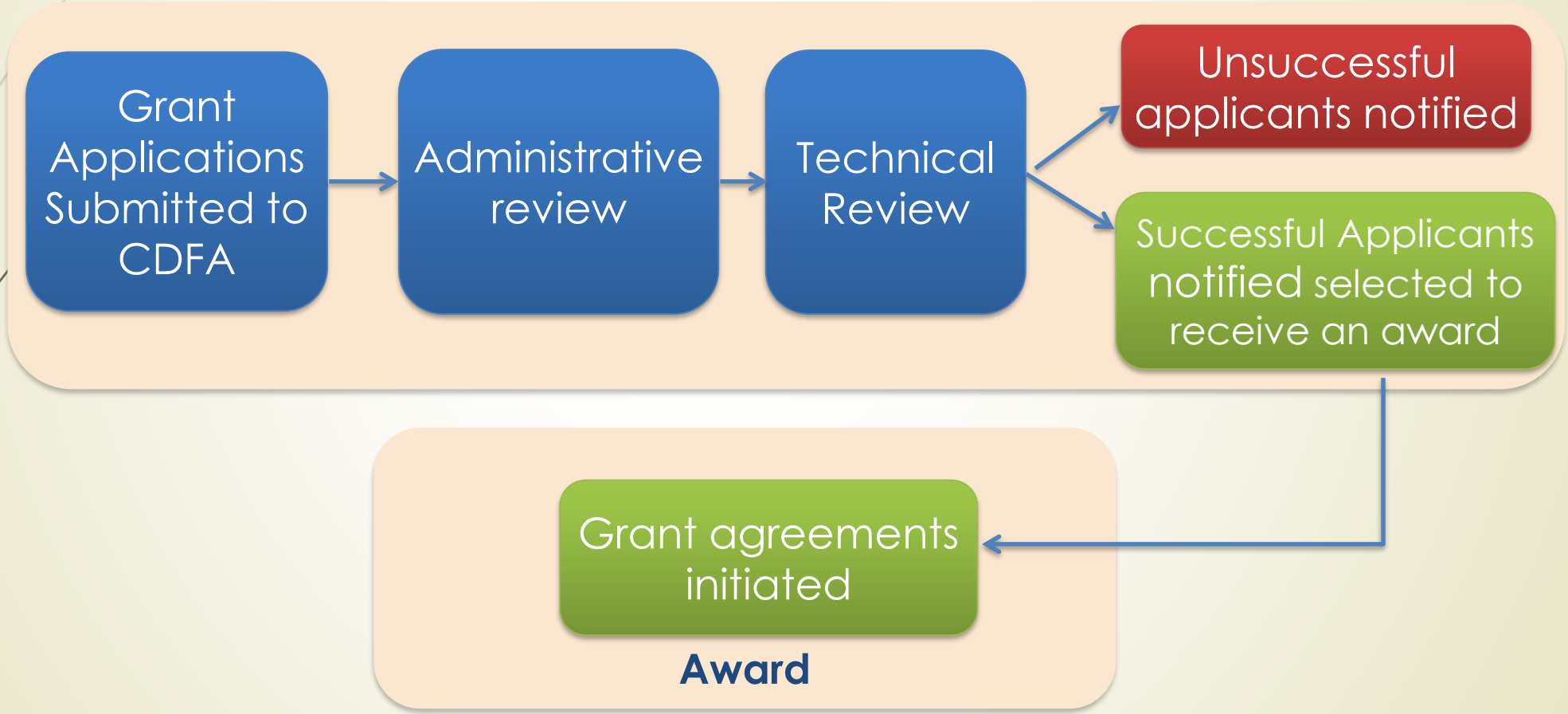
Solicitation process



2017 HSP Solicitation Timeline

Item	Dates
Release Request for Grant Applications	August 8, 2017
CDFA Application Workshops & Webinar	August 15 – 25, 2017
Additional Technical Assistance Workshops	August 16 – Sep 19, 2017
Grant Applications Due	September 19, 2017, 5:00 pm PDT
Review Period	September – November, 2017
Award Announcement	December 2017
Project Implementation Begins	January 2018

- ✓ **CDFA conducted four workshops and an online webinar available to remote participants.**
- ✓ **CDFA funded local RCDs and non-profit organizations to provide 27 workshops and other application assistance.**

Review and Evaluation process

Multiple Levels of Review:

- Administrative Review: Internal - Conducted by CDFA.
- Technical Review: External - Conducted by Technical Reviewers (University experts).

Scoring Criteria	Points
Project Feasibility	**30**
Project Sustainability	**10**
GHG Emission Reduction Benefits	**20**
Soil Health and Environmental Co-Benefits	**10**
Conservation Plan	**10**
Disadvantaged Communities	**10**
Additional Considerations	**10**
Total	**100**

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2017 HSP Application Summary

	Category	#	Funds Requested (Million)	Matching Funds (Million)
HSP Incentives Program	Complete Applications	69	$ 1.99	$ 1.99
	Applications under Technical Review	66	$ 1.92	$ 1.96
HSP Demonstration projects	Complete Applications	27	$ 4.70	$ 3.47
	Applications under Technical Review	25	$ 4.40	$ 3.30

2017 HSP Applications County Distribution

Applications Located in Central Valley

HSP Incentives Program		HSP Demonstration Projects	
County	**Applications**	**County**	**Applications**
Merced	10	Yolo	4
Colusa	3	Fresno	2
Fresno	2	Merced, Tehama	1
Stanislaus	2		
Tulare	2	Merced San Joaquin Sutter	1
Tehama	2		
Yolo	2		
Sacramento	1	Yuba	1
San Joaquin	1		
Nine	**25**	**Eight**	**9**

- **HSP Incentives Program**
  69 applications from 27 counties
- **HSP Demonstration Projects**
  27 applications located in 23 counties.

FUTURE FUNDING SOURCE

SB-5

CALIFORNIA DROUGHT, WATER, PARKS, CLIMATE, COASTAL PROTECTION, AND OUTDOOR ACCESS FOR ALL ACT OF 2018

- Chapter 10. Climate Preparedness, Habitat Resiliency, Resource Enhancement, And Innovation

- 80134. (b) Of the amount subject to this section, the sum of ten million dollars ($10,000,000) shall be available to the Department of Food and Agriculture for grants to promote practices on farms and ranches that improve agricultural and open-space soil health, carbon soil sequestration, erosion control, water quality, and water retention.

Program Contacts

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