

2017 Healthy Soils Program Incentives Program – Part II

The Healthy Soils Program is funded by California Climate Investments

Grant Award Procedures Manual



California Department of Food and Agriculture

Office of Grants Administration

1220 N Street, Room 120

Sacramento, CA 95814

(916) 657-3231

grants@cdfa.ca.gov

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Overview

Authority and Program Purpose

The Healthy Soils Program (HSP) 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 2017 HSP Incentives Program provides financial incentives to California growers and ranchers for agricultural management practices that sequester carbon, reduce atmospheric greenhouse gases (GHG), and improve soil health. The program is funded by the Greenhouse Gas Reduction Fund (GGRF). All projects that receive GGRF monies are required by [Government Code Section 16428.9](#) to achieve GHG emission reductions and further the purposes of the Global Warming Solutions Act of 2006 ([AB 32](#)).

Purpose of the Grant Awards Procedures Manual

The HSP Incentives Program Grant Award Procedures (GAP) Manual provides direction to Grant Recipients (Recipients) for the successful management of HSP Incentives Program funded projects. The GAP Manual identifies the roles and responsibilities of the parties to the agreement and describes the processes and procedures required by the terms and conditions in the Grant Agreement.

General Responsibilities

Office of Grants Administration

The California Department of Food and Agriculture (CDFA), Office of Grants Administration (OGA) manages the HSP Grant Agreements and ensures Recipients are compliant with program requirements and grant terms and conditions. OGA also provides Recipients with assistance and consultation throughout the Grant Agreement term.

Office of Environmental Farming and Innovation

CDFA's Office of Environmental Farming and Innovation (OEFI) will provide consultation on technical aspects of project implementation as necessary to OGA and Recipients. OEFI also is responsible for conducting practice verifications for the projects.

Grant Recipients

Recipients are responsible for project implementation as outlined in the Grant Agreement scope of work (SOW) which includes ensuring that all project activities comply with grant terms and conditions. Recipients are responsible for the timely submission of invoices upon completion of the annual [Project Verification](#).

In addition, in Project Year 3, Recipients must continue the implementation of all eligible agricultural management practices using the required [Cost Share](#). All management practices

must be maintained for a minimum of three years, according to United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Conservation Practice Standards (CPS) and/or guidelines in the [CDFA Compost Application White Paper](#). For Establishment of Woody Cover Practices, the expected practice life span is ten years.

Reference the [Post-Project Requirements](#) section for details regarding expectations and responsibilities for continuing the implementation of management practices after the Grant Agreement term.

Prior Approval Required

Prior approval is required from OGA for the following:

- Revision of the scope of work, eligible agricultural management practices, work plan, activities, milestones, dates, or deliverables.
- Budget changes.
- Change in recipient organization or key personnel.

Recipients should contact their assigned Grant Specialist in writing whenever a change requiring prior approval is necessary or if they are uncertain whether a project activity or cost requires prior approval. Failure to obtain prior approval may result in costs being deemed unallowable and request for grant funds being denied.

Project Management

Recipients are responsible for the overall management of the project, ensuring all project activities are completed as identified in the Work Plan and are in compliance with program requirements and the Grant Agreement terms and conditions.

Eligible agricultural management practice implementations must occur on the Assessor Parcel Number(s) (APNs) identified in the approved SOW. Additionally, implementation must begin no later than November 30, 2018. Failure to implement management practice(s) on the APN(s) identified in the approved SOW prior to November 30, 2018, may result in all or any portion of the grant funding being withheld and/or termination of the Grant Agreement.

Project Updates

Recipients are required to maintain clear and consistent communication with OGA regarding project progress during the Grant Agreement term. This includes:

- Notification of changes in cost share agreements (reference [Cost Share](#)).
- Notification of changes to implementation dates (reference [Scope of Work Revisions](#)).
- Notification of issues affecting the project progress (reference [Notification of Problems and Delays](#)).

Cost Share

Cost share can be in the form of matching funds or in-kind contributions. Matching funds refers to a dollar amount committed to the project from a source other than the HSP. An in-kind contribution is the estimated dollar value of any time, property, or supplies donated to a project. Cost share must be reasonable and consistent with costs paid for equivalent work on non-grant funded activities for comparable work in the labor market.

The Grant Agreement term is from May 1, 2018 to December 31, 2020 (three years). HSP will provide funds for implementation of eligible agricultural management practice(s) for Project Years 1 and 2 (May 1, 2018 – December 31, 2019). Recipients are required to continue implementation of the same management practice(s) for Project Year 3 (January 1, 2020 – December 31, 2020) with cost share.

For Recipients providing matching funds in Project Years 1 and 2 (May 1, 2018 – December 31, 2019), documentation reflecting all expenses incurred to support the project must be submitted to OGA with the annual invoice.

The Recipient is to notify the assigned Grant Specialist if the amount or activities covered by cost share have changed.

Allowable Costs

A cost is allowable if it is approved in the project budget, directly relates to the implementation of eligible agricultural management practices and is incurred solely to advance work under the Grant Agreement.

Unallowable Costs

A cost is unallowable if it does not comply with program requirements or other terms and conditions of the Grant Agreement. A cost is also unallowable if it is not contained in the approved scope of work and is not necessary and reasonable to implement the approved eligible agricultural management practices. Unallowable costs will not be counted toward a Recipient's required [Cost Share](#).

If a Recipient is uncertain whether a cost is allowable, they must contact their assigned Grant Specialist before the cost is incurred.

Scope of Work Revisions

SOW revisions are required when implementation dates or eligible agricultural management practices must be altered, especially if such changes affect the Recipient's ability to implement practices within each designated Project Year or complete implementation of the approved practices.

Requests for revisions must be made in writing to the assigned Grant Specialist and provide a detailed justification explaining the need for the change and how the proposed change benefits or enhances the project.

Notification of Problems and Delays

Recipients must immediately notify OGA of any delays, problems, and/or adverse conditions that may materially affect the project. Examples include but are not limited to: inability to collect soil samples; inability to implement the approved eligible agricultural management practices according to specifications; and inability to implement the approved management practice(s) according to the work plan or work plan schedule.

In such cases, Recipients must contact their assigned Grant Specialist immediately for purposes of resolving such delays and/or problems.

Invoicing

Invoicing for Payment

Payment is based on the [Standard Payment Rates for Eligible Agricultural Management Practices](#) and reimbursed upon verification of the eligible agricultural management practices implemented in the approved SOW. It may take up to 45 days from the date the invoice is approved for a check to be issued by the State Controller's Office on behalf of CDFA.

Recipients can email a scanned, legible copy of the signed invoice to their assigned Grant Specialist, or a hard copy can be mailed to:

California Department of Food and Agriculture
Office of Grants Administration (Healthy Soils Program)
1220 N Street, Suite 120
Sacramento, CA 95814

To receive payment, Recipients must notify their assigned Grant Specialist upon complete implementation of all management practices, to begin [Project Verification](#) for that Project Year. Invoices will be processed after project implementation has been verified.

When to Submit Invoices

OGA initiates each invoice cycle by generating an electronic invoice template. Upon notification by Recipient of complete implementation of all eligible agricultural management practices for a given Project Year, OGA emails Recipients an invoice template with the Grant Agreement Number, Project Title, Invoice Number, Project Budget per practice, Amount Requested, and Invoiced to Date entered. The invoice template provided by OGA must be used; invoices generated or altered by the Recipient will not be accepted. Invoices are due no later than 30 calendar days following completion of the Project Year implementation.

Completing an Invoice

Recipient verifies the Amount Requested column on the invoice for each eligible agricultural management practice implemented, then completes, signs, dates, and returns the invoice to OGA. The Recipient will also enter the amount of Matching Funds to Date, if applicable.

For detailed instructions on completing the CDFA invoice template, refer to [Appendix A](#).

Final Invoices

Recipient follows the instructions for Completing an Invoice, and ensures the invoice is marked "Final" indicating all payment obligations have been met and no further payments

are due.

Final Invoices (required at the end of Project Year 2) are due no later than 30 calendar days following the completion of the Project Year 2 implementation. Note, as with Project Year 1, payment will not be made until [Project Verification](#) has occurred.

Withholds

OGA will issue a Withhold Payment Notification to delay payment of an invoice if there is an invoice discrepancy or error, unallowable costs claimed, or outstanding reports. The Withhold Payment Notification describes the reason for withholding payment and what actions, if any, are required to resolve the issues for withholding payment. Invoices are processed once all issues are resolved. A Withhold Payment Notification will not be sent for funds withheld pending closeout, see Withhold Pending Closeout below.

See [Appeal Process](#) for information regarding appealing a Withhold Payment Notification.

Withhold Pending Closeout

OGA will withhold ten percent of the Grant Agreement award until approval of the Final Invoice (required at the end of Project Year 2) and/or resolution of any performance issues through Project Year 2. A Withhold Payment Notification will not be sent, and the ten percent withheld may not be appealed. The ten percent withholding will be released contingent upon approval of the Final Verification and receipt of a signed Project Year 3 Certification confirming all practices will be implemented in Project Year 3 as proposed.

Soil Testing Requirements

Reporting Requirements

Recipients are required to submit reports on soil organic matter content for each APN/Field to CDFA at the following times:

- Prior to initial implementation of funded practices in Project Year 1 (2018).
- One year after initial implementation (2019): For Soil Management Practices (Cropland Management or Compost Application), Recipients are required to take soil sample(s) prior to implementation of practices in that project year. For all other practices, soil samples can be collected after practice implementation in that year.
- Two years after initial implementation (2020): For Soil Management Practices (Cropland Management or Compost Application), Recipients are required to take soil sample(s) prior to implementation of practices in that project year. For all other practices, soil samples can be collected after practice implementation in that year.
- Three years after initial implementation (2021): For Soil Management Practices (Cropland Management or Compost Application), Recipients are required to take soil sample(s) prior to implementation of practices in that project year. For all other practices, soil samples can be collected after practice implementation in that year.

A laboratory report of soil organic matter content for each APN/Field can come from any of the accredited soil analytical laboratories recommended by CDFA¹. Please follow the “Soil Sampling Protocol” provided in [Appendix B](#) when collecting soil samples.

¹ CDFA recommended soil analytical labs are listed at the following websites:

- Selected Plant and Soil Laboratories in Northern and Central California: <http://cesonoma.ucanr.edu/files/27431.pdf>
- UC Cooperative Extension El Dorado County List of Laboratories for Tissue/Soil/Water – Agricultural Analysis: <http://cecentralsierra.ucanr.org/files/115331.pdf>
- UC ANR Soils Testing Laboratories for Home Gardeners: <http://ccmg.ucanr.edu/files/51308.pdfh>

Compliance

Project Verification

HSP Incentives Program projects are subject to a minimum of one Project Verification for each Project Year. Project Verification will be conducted by CDFA or a third-party CDFA-appointed entity who will conduct field evaluations by APN to verify program compliance during the Grant Agreement term.

Verification will ensure that the eligible agricultural management practices have been implemented according to the SOW and in a manner consistent with the USDA NRCS CPS guidelines and/or CDFA Compost Application White Paper. Additionally, it will determine whether and when deliverables are being met and evaluate project progress to ensure the management practice(s) are completed within the Grant Agreement term. Recipients may be required to submit project related documentation (such as photos, receipts for payment of services/goods) to ensure HSP Incentives Program funds are used in compliance with the Grant Agreement terms and conditions.

Recipients must notify CDFA when implementation has been completed for each Project Year to initiate the Project Verification process. Yearly verification should be requested by the Recipient when all management practices have been implemented in Project Year 1, 2 and 3. The Final Verification must be completed by March 31, 2021.

Consistent with the [CARB Funding Guidelines for Administering Agencies \(Final Supplement – December 2016\)](#), the State of California has the right to review project documents and conduct audits during project implementation and over the project life.

Termination of Grant Agreement

CDFA may terminate a Grant Agreement for noncompliance. The Recipient will be notified in writing of the reasons for termination, the date the termination is effective, and the method for appealing the termination.

Appeal Process

Actions that may be appealed include but are not limited to:

- Withhold Payment Notification (see [page 7](#));
- Termination of Grant Agreement (see [page 9](#))

Appeals must be in writing either emailed to: CDFA.LegalOffice@cdfa.ca.gov

Or via mail to:

California Department of Food and Agriculture
Legal Hearing and Appeals Office
1220 N Street
Sacramento, CA 95814

The appeal must include a copy of the notification or the name of the Recipient organization, the project number, the title of the project, the reasons the action should not be imposed, including any documentation to support the appeal, and the signature of the authorized representative. Appeals must be postmarked (date stamped if via email) within 10 business days of the notice of action from OGA.

Appeals not received within this timeframe will be denied.

The action specified in the notification remains in effect while the appeal is under review.

Closeout

Before the Grant Agreement is closed, OGA will review the Final Verification Report and verify resolution of any project performance concerns. A closeout letter will be issued when closeout review is completed.

Note: Close-out does not cancel record retention, financial accountability, or post-project requirements.

Record Retention

Recipients must retain invoices, project records, and any other relevant supporting documents for a period of three years from the date of the close-out letter.

Post-Project Requirements

Recipients are required to maintain implementation of practices incentivized through the HSP Incentives Program for a minimum of three years from the date of the close out letter. However, benefits from implementation of practices are expected to be achieved in the long term. Recipients have a continued expectation to expand these practices on their operations to achieve long-term benefits. Additionally, Recipients are required to maintain documentation related to their HSP funded projects, including records documenting maintenance of the agricultural management practice(s) and any soil testing reports for the project APNs, to report actual benefits achieved for three years after the project close out.

Appendix A: CDFA Invoice Template

Recipient must complete all yellow shaded sections below.

Bill to:
 CA DEPARTMENT FOOD & AGRICULTURE
 1220 N STREET
 SACRAMENTO, CA 95814

INVOICE

Heathy Soil Incentives Program

Make Check Payable to:
ABC Farms, Inc
 Address
 City, State, Zip
 Attn: xxx

Grant Agreement Number: 17-xxxx-000-HS Billing Period: Jan 2018 - Dec 2018 Invoice Date: 28-Dec-18 Invoice Number: 17-xxxx-000-HS-1
Month/Year to Month/Year

Recipients Name: ABC Farms, Inc Project Title: ABC Farming improvements

1	Grant Budget	8	Invoiced to Date	4	Yr 1 Amount Requested	7	Remaining Balance
	1. Soil Management Practices \$ 36,750.00		\$ -		\$ 18,375.00		\$ 18,375.00
	2. Cropland to Herbaceous Cover Practices \$ -		\$ -		\$ -		\$ -
	3. Establishedment of Woody cover Practices \$ 8,316.00		\$ -		\$ 8,316.00		\$ -
	4. Soil Organic Matter Analysis \$ 300.00		\$ -		\$ 150.00		\$ 150.00
	Totals: \$ 45,366.00		\$ -		\$ 26,841.00		\$ 18,525.00
		5	Less Advance Payment:		0.00		
	9	Matching Funds to Date:		\$14,000.00			
		6	Amount to be Paid:		\$ 26,841.00		

10 I certify the amount requested is for actual and allowable expenditures incurred for HSP Incentives Program activities performed in accordance with CDFA Grant Agreement provisions.

PREPARER'S NAME & SIGNATURE _____ PHONE NUMBER _____ E-MAIL ADDRESS _____ DATE _____

AUTHORIZED NAME & SIGNATURE _____ PHONE NUMBER _____ E-MAIL ADDRESS _____ DATE _____

FOR STATE USE ONLY

\$	2017-18		5432500	659000085L	
<small>AMOUNT</small>	<small>STATE FISCAL YEAR</small>	<small>GRANT SPECIALIST INITIALS AND DATE</small>	<small>ACCOUNT CODE</small>	<small>PROGRAM CODE</small>	<small>SUPPLIER ID</small>
Tiffany Kelly	X		632-09	8635L	
<small>CDFA AUTHORIZED APPROVER</small>	<small>CDFA AUTHORIZED SIGNATURE</small>	<small>DATE</small>	<small>OBJECT CODE</small>	<small>PRGM COST ACCT (PC#)</small>	<small>VENDOR ID</small>

Liquidate against Advance payment.
 Withhold 10% of Grant Award until Project is verified.
 Project verified. Final payment.

CDFA Invoice Template Instructions and Definitions

Recipients must complete all yellow shaded sections identified on the CDFA invoice template. The following provides definitions and instructions on completing specific sections of the CDFA invoice template to request reimbursement payments for costs incurred to implement the project. For questions regarding and assistance with completing this template, Recipients should contact their assigned Grant Specialist.

Grant Budget: The total grant award amount for each budget category as identified in the approved Budget. Reimbursement for project expenditures is based on these categories and amounts.

Billing Period: The yearly period in which project costs were incurred. For example, if project costs were incurred during the first billing year, the billing period is May 2018 – December 2018.

Invoice date: The date Recipient completes and signs the CDFA Invoice template.

Amount Requested: Review the dollar amounts in each budget category to request reimbursement for project costs that were incurred during the billing period. The amount requested in each budget category cannot exceed the total amounts listed under the “Grant Budget” or the yearly amount detailed in the Scope of Work section of the Grant Agreement under the Attachment 1a - Budget Details.

Less Remaining Advance: If Advance Payment was requested, OGA will adjust the “Less Remaining Advance” amount based on approved advance payment. The invoice template will automatically calculate the “Amount to be Paid” less the “Advance Payment.”

Amount to be Paid: The total payment amount requested for project costs that were incurred during a billing period. The invoice template will automatically calculate this total. Once OGA approves the invoice, the “Amount to be Paid” will be the amount issued for reimbursement.

Remaining Balance: The amount of grant funding remaining that has not been paid. OGA will not approve an invoice with negative balances in this column. Contact your assigned Grant Specialist if a budget revision is needed.

Invoiced to Date: The total project cost amount reimbursed for each budget category based on previously approved invoices. OGA will adjust the “Invoiced to Date” amount each billing period.

Matching Funds to Date: Input the total matching funds and/or in-kind contributions contributed by Recipient to implement the project.

Preparer/Authorized Signatures: An authorized representative of the agriculture operation (Recipient) must print their name and sign on the “Authorized signature” line to certify the amount requested for each billing period. If the invoice was prepared on behalf of the Recipient, the preparer should print their name and sign on the “Preparer’s signature” line. OGA will not approve invoices without the Recipient signing as the “Authorized signature.”

Appendix B: Soil Sampling Protocol for Soil Organic Matter Analysis

WHAT DO I NEED?

Be sure to bring materials with you when heading to the field for soil sampling.

As shown in Figure 1, these materials include:

1. Two buckets (one for sample and one for supplies)
2. Soil sample bags: one-gallon freezer storage bags (or soil sample bags); one bag per sample
3. One clipboard and papers for recording
4. Permanent marker and/or pen
5. A soil probe or straight shovel (sharpshooter or drain spade style).
6. Ice pack(s) (**optional**, needed for hot days when samples for nitrogen content or biological properties.)



Figure 1. Materials needed for soil sampling.

WHERE TO SAMPLE?

A. Determine the number of samples to be taken from each field (or APN).

Decide whether one sample will adequately represent the field (or APN), or whether an APN should be split into multiple sampling units. A field is not the same and may vary in soil type, fertility, or cropping and management histories. Divide the field into different sampling units and make sure conditions inside the same sampling unit are as uniform as possible. If a uniform field is very large, you may need to divide it into several sampling units so as each sampling unit is no larger than 20 acres. One soil sample is needed from each unit.

Inside a sampling unit, a composite soil sample is taken.

1. Identify locations within the unit where soil samples are representative.
2. Borders and irregular areas should be avoided, unless a sample is specifically being collected from those areas to identify constraints.
3. As shown in Figure 2, one soil core from each location. Total 14 cores will be taken mixed in the bucket to make a composite soil sample to represent the sampling unit.
4. For a sampling unit, about 10 -20 locations should be selected to make a composite sample.

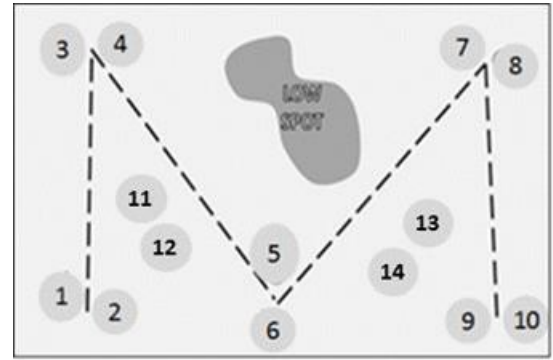


Figure 2. Locations where samples should be taken within a sampling unit.

HOW TO TAKE A COMPOSITE SOIL SAMPLE?

A. Two important requirements must be met when taking soil samples:

1. A uniform slice of soil from the soil surface to a desired depth must be taken.
2. The same volume of soil must be collected from each sample location.

B. Depth to sample:

Depth to take soil samples is usually determined by the crop, what you are interested to know, and your knowledge about the soil profile. For soil organic matter content for the purpose of the 2017 CDFA Healthy Soils Program, sampling depth should be from surface to 8" deep.

C. How to take sample with a soil probe (Figure 3)

1. Remove surface debris (A).
2. Push probe steady and straight to the desired depth (e.g., 8" in a tomato field) (B).
3. Remove the core and place it in the clean bucket.
4. Go to the next location and repeat steps 1-3.

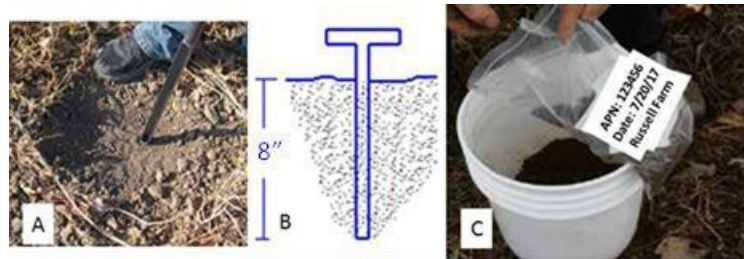


Figure 3. Taking samples with a soil probe.

5. Finish sampling from all (ten or more) locations.
6. Gently mix soils in the bucket and collect them in the sample bag labeled with the APN, sampling date, and farm name (C).

D. How to take samples with a shovel or spade (Figure 4)

1. Remove surface debris (A).
2. Use the spade to dig a small hole about 8" deep. From the side of the hole, **take a vertical, rectangular slice of soil 8" deep and about 2" thick** (B).
3. Remove any extra soil to ensure that the sample is the same width at the top and bottom of the slice. It is important to collect the same amount of soil through the 6" sample profile so that it is not biased with more soil from the surface compared to the subsurface (C).
4. Place sample into a clean bucket.
5. Go to the next location and repeat the steps 1-4 for all locations.



Figure 4. Taking samples with a shovel.

6. Gently mix soils in the bucket and collect 6 cups of well-mixed soils (or no less than 1 lb.) into the sample bag labeled with the APN, sampling date, and farm name (D).

SAMPLE STORAGE AND SHIPPING TO A SOIL TESTING LABORATORY

Before you send your soil samples for analysis, ensure that the laboratory uses University of California test methods, which are test methods proven on California farms by the University. Contact the soil testing laboratory where you plan to send your samples.

CDFA recommends the laboratories listed at the following websites for tests conducted for the 2017 Healthy Soils Program:

- Selected Plant and Soil Laboratories in Northern and Central California: <http://cesonoma.ucanr.edu/files/27431.pdf>.
- UC Cooperative Extension el Dorado County List of Laboratories for Tissue/Soil/Water
– Agricultural Analysis: <http://cecentralsierra.ucanr.org/files/115331.pdf>.
- UC ANR Soils Testing Laboratories for Home Gardeners:
<http://ccmq.ucanr.edu/files/51308.pdf>.
- Selected Plant and Soil Testing Laboratories in Central and Southern California:
http://ceventura.ucanr.edu/Com_Ag/Subtropical/Avocado_Handbook/Resources/Plant_Disease_Diagnostics_and_Soil_Testing_Labs_in_California-1999/

Please check with the laboratory where you intend to send samples to ensure if there are specific requirements regarding sample storage, packing and shipping. Requirements may be different depending on what soil properties are to be tested. Provided below are general guidelines regarding handling of soil samples:

- Ship your soil samples to a soil test laboratory as soon as possible.
- Ensure all sample bags are correctly labeled and sealed.
- Provide a soil sampling form together with samples in the shipping box.
- For tests on soil texture, organic matter content, pH, cation exchange capacity or mineral contents other than nitrogen, samples can be handled at room temperature.
- For tests on nitrogen content and/or biological properties (e.g. microorganisms), keep samples out of direct sunlight and store as cool as

possible (ice packs recommended) during sampling and storage. Store samples in a refrigerator or cold room after returning from the field. Pack soil samples with ice packs when shipping.

- Contact the soil testing laboratory a few days after samples are shipped to check they were received and are being handled properly.

SOIL HEALTH DATA

A. Required by CDFA

The cost of the following test is covered by the 2017 CDFA HSP Incentives Program funds in Project Years 1 and 2 and by matching funds provided by awardees in Project Year 3.

- Soil organic matter content.

B. Optional data, encouraged but not required by CDFA

The costs of the following tests are to be covered by matching funds provided by awardees during the full project term (i.e. 3 years).

Physical properties:

- Bulk density
- Surface hardness
- Subsurface hardness)
- Water infiltration
- Water holding capacity
- Aggregate stability
- Saturated hydraulic conductivity

Chemical Properties

- pH
- Soil chemical composition

Biological properties

- Active or labile carbon
- Soil protein
- Soil respiration
- Earthworms

REFERENCES

Moebois-Clune B.N., D.J. Moebois-Clune, B.K. Gugino, O.J. Idowu, R.R. Schindelbeck, A.J. Ristow, H.M. van Es, J.E. Thies, H.A. Shayler, M.B. McBride, D.W. Wolfe, and G.S. Abawi. 2016. Soil sampling protocol. In Comprehensive Assessment of Soil Health. Soil and Crop Science Section, Cornell University. Ithaca, NY. P. 27-30.

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UCCE UC Small Farm Program, 2017. Soil sampling.

http://sfp.ucdavis.edu/pubs/Family_Farm_Series/Veg/Fertilizing/soil