

UC and NRCS Resources (and how to use them)

Joy Hollingsworth, UCCE Fresno Soil Quality/Nutrient Management Farm Advisor
Anthony Fulford, UCCE Modesto Soil Quality/Nutrient Management Farm Advisor



Introductions

- Anthony: San Joaquin, Stanislaus, Merced
- Joy: Fresno, Madera, Kings, Tulare
- New UC-NRCS agreement to jointly fund these positions
- UCCE: Research and Extension
- NRCS: Financial and Technical support



Natural Resources Conservation Service
California

Our Role

- Research and extension
- Technical support to NRCS
- Bridge between the organizations




Who is the NRCS?

- Non-regulatory agency within the USDA
- Originally formed to soil erosion problems in 1935
- Offer voluntary programs, funded through the Farm Bill, which provide financial and technical support




2 Main Programs in CA: EQIP and CSP

 United States Department of Agriculture

Environmental Quality Incentives Program

Natural Resources Conservation Service



USDA's Natural Resources Conservation Service offers voluntary Farm Bill programs that benefit both agricultural producers and the environment.

Overview

The Environmental Quality Incentives Program (EQIP) provides technical and financial assistance to producers to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion, and improved or created wildlife habitat.

Benefits

Through EQIP, NRCS provides agricultural producers with one-on-one help and financial assistance to plan and implement improvements, or what NRCS calls conservation practices. Together, NRCS and producers invest in solutions that conserve natural resources for the future while improving agricultural operations.

Program at a Glance

NRCS will help you develop a conservation plan that meets your goals and vision. This plan becomes your roadmap for selecting the right conservation practices for your land. NRCS offers about 200 unique practices designed for working farms, ranches, and forests.

NRCS financial assistance can cover part of the costs of implementing conservation practices.

Who is Eligible?

Farmers, ranchers, and forest landowners who own or rent agricultural land are eligible. EQIP assistance can be used on all types of agricultural operations, including:

- Conventional and organic
- Specialty crops and commodity crops
- Forestry and wildlife
- Historically underserved farmers*
- Livestock operations

*Increased and advance payments available for historically underserved producers (beginning, limited resource, socially disadvantaged, and military veterans.)

How to Apply

Apply at your local USDA Service Center, which you can find at farmers.gov/service-locator.

Applications for EQIP financial assistance are accepted throughout the year. Specific state deadlines are set for ranking and funding. If your application is ranked and selected, you will enter into a contract with NRCS to receive financial assistance for the cost of implementing conservation practices. Payment rates for conservation practices are reviewed and set each fiscal year.

More Information

For more information, visit nrcs.usda.gov/farmbill or farmers.gov.

Find your local USDA Service Center at farmers.gov/service-locator.

What's New in the 2018 Farm Bill

Adds potential resource concerns related to beneficial cost-effective operation changes.

Raises cap for organic producers to \$140,000 over four years.

New enrollment option through incentive contracts to address priority resource concerns.

Requires advance payment option be offered to historically underserved producers.


Authorizes direct program assistance to irrigation districts, including acequias and other entities, for purposes of improving water use efficiencies.

Natural Resources Conservation Service




USDA is an equal opportunity provider, employer, and lender.

July 2019 nrcs.usda.gov

 United States Department of Agriculture

Conservation Stewardship Program

Natural Resources Conservation Service



USDA's Natural Resources Conservation Service offers voluntary Farm Bill programs that benefit both agricultural producers and the environment.

Overview

The Conservation Stewardship Program (CSP) helps agricultural producers maintain and improve their existing conservation systems and adopt additional conservation activities to address priority resource concerns. CSP pays participants for conservation performance—the higher the performance, the higher the payment.

Benefits

CSP addresses various resource concerns including soil quality, soil erosion, water quality, water quantity, air quality, plant resources, and animal resources as well as energy.

How It Works

CSP provides two possible types of payments through five-year contracts: annual payments for installing new conservation activities and maintaining existing practices; and supplemental payments for adopting a resource-conserving crop rotation.

Who is Eligible?

Applicants may include individuals, legal entities, joint operations, or Indian tribes that meet the stewardship threshold for at least two priority resource concerns when they apply. They must also agree to meet or exceed the stewardship threshold for at least one additional priority resource concern by the end of the contract. Producers must have effective control of the land for the term of the proposed contract.



USDA is an equal opportunity provider, employer, and lender.

Eligible lands include private and tribal agricultural lands, cropland, grassland, pastureland, rangeland, and nonindustrial private forest land. CSP is available to all producers, regardless of operation size or type of crops produced, in all 50 states, the District of Columbia, and the Caribbean and Pacific Island areas.

New CSP Grasslands Conservation Initiative

Provides financial assistance to conserve grasslands through a single opportunity to enroll in a 5-year contract. Eligible lands are limited to cropland for which base acres have been maintained under FSA's ARC/PLC and were planted to grass or pasture, including idle or fallow, during a specific period. Enrolled acreage must be managed consistently with a grassland conservation plan.

How to Apply

Apply at your local USDA Service Center, which you can find at farmers.gov/service-locator. Applications are accepted at any time.

Payments are made soon as practical after October 1 of each fiscal year for contract activities installed and maintained in the previous year.

What's New in the 2018 Farm Bill

Increases payment rates for adoption of cover crop rotations and advanced grazing management activities.

Extends contracts to facilitate renewal under new program authority.

Authorizes specified annual funding levels.

Provides specific support for organic and transitioning to organic production activities.

Adds new CSP Grasslands Conservation Initiative.

More Information

For more information, visit nrcs.usda.gov/farmbill or farmers.gov.

Find your local USDA Service Center at farmers.gov/service-locator.

Natural Resources Conservation Service

July 2019 nrcs.usda.gov

Environmental Quality Incentives Program



- Meet one-on-one with a NRCS planner to discuss your goals
- They'll evaluate the land's resources and come back to you with multiple options on how to address the concerns
- The plan will submitted and ranked
- If selected, you'll be eligible for reimbursement of part of the costs of implementing the plan
- Popular practices include cover crops, prescribed grazing, and irrigation management

Conservation Stewardship Program

- Designed for producers who already have conservation systems in place
 - Must meet stewardship threshold for at least 2 priority concerns when apply
 - Must meet or exceed the threshold for at least 1 more priority concern by end of contract
- Benefits
 - Increased crop yields
 - Decreased inputs
 - Wildlife habitat population improvements
 - Increased resilience to weather extremes



Photo courtesy of USDA NRCS

NRCS Tools

- Soil Tillage Intensity Rating (STIR)
 - Compares different types of tillage
- COMET
 - Quantifies greenhouse gases
- Soil Conditioning Index
 - Predicts consequences of different cropping systems and tillage practices on soil organic matter



Web Soil Survey

<https://websoilsurvey.nrcs.usda.gov>

Eastern Fresno Area, California (CA654)			
Eastern Fresno Area, California (CA654)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Et	Exeter sandy loam, shallow	5.8	3.3%
Hc	Hanford sandy loam	30.3	17.1%
Hg	Hanford sandy loam, silty substratum	20.7	11.7%
Hk	Hanford sandy loam, hard substratum	8.6	4.8%
Hm	Hanford fine sandy loam	73.7	41.6%
Hr	Hanford fine sandy loam, hard substratum	13.6	7.7%
Hsr	Hesperia fine sandy loam	24.5	13.8%

Report — Map Unit Description

Eastern Fresno Area, California

Hc—Hanford sandy loam

Map Unit Setting

National map unit symbol: h15f

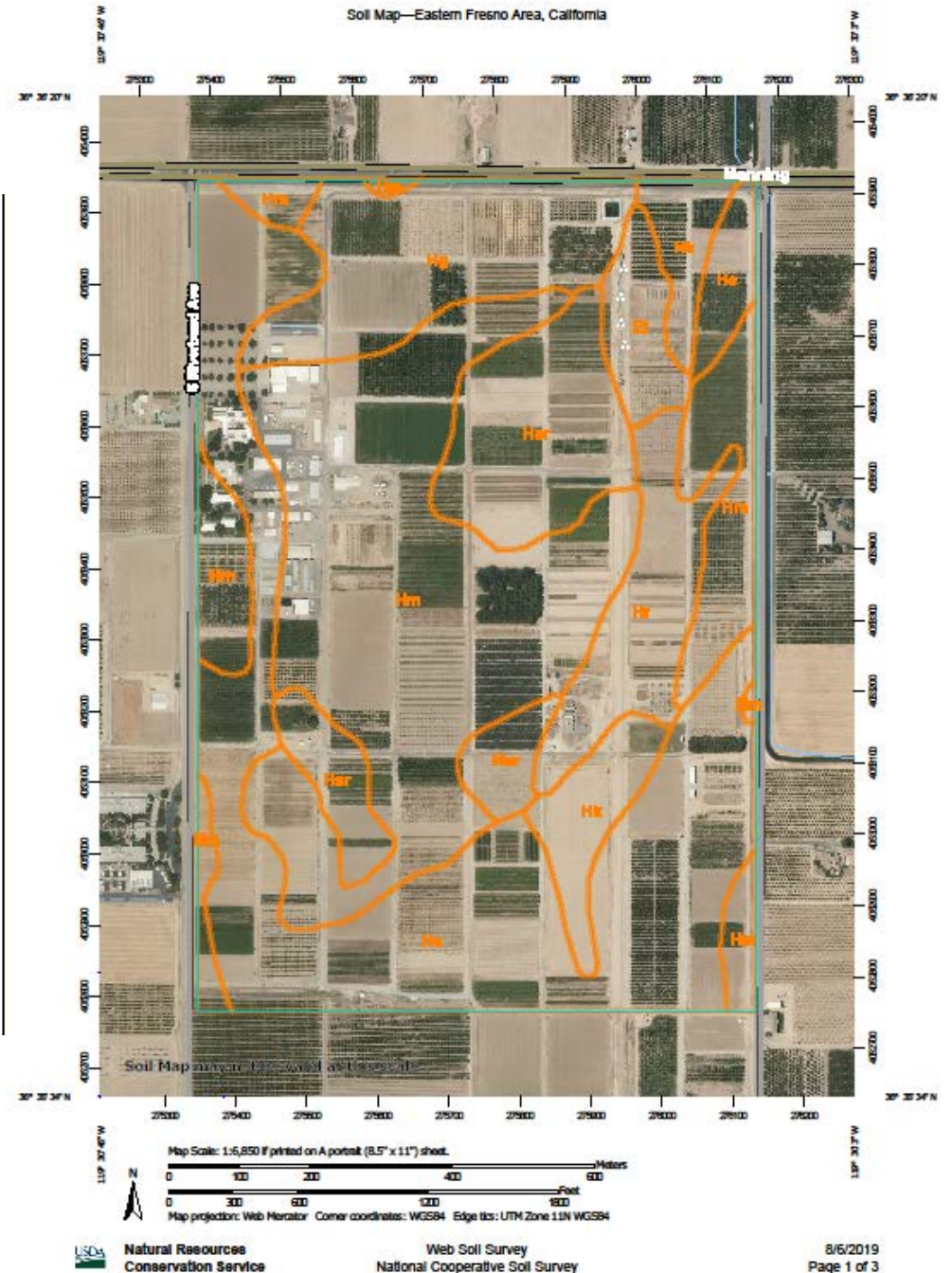
Elevation: 200 to 500 feet

Mean annual precipitation: 8 to 15 inches

Mean annual air temperature: 61 to 63 degrees F

Frost-free period: 250 to 275 days

Farmland classification: Prime farmland if irrigated



More information

- Funding comes in cycles, but applications accepted year-round
- To find your local field office, go to www.farmers.gov/service-locator
- Stockton
- Modesto
- Merced
- Madera
- Fresno
- Hanford
- Visalia
- Bakersfield

Photo courtesy of USDA NRCS

UCANR Nutrient Management Resources

- UCANR is a state-wide network
 - Advisors, specialists, admin, staff, and scientists
- Extending science-based information
 - Diverse clientele needs, cropping systems, and nutrient management constraints
- Sources of nutrient management information
 - Online resources – factsheets, technical bulletins, production manuals, etc.
 - Decision-support tools – site-specific recommendations
 - Human resources – farm advisors, education specialists, etc.



We are problem-solvers, catalysts, collaborators,
educators and stewards of the land,
living in the communities we serve.

#WeAreUCANR

Nutrient Management: Online Resources

- Goal = find relevant information quickly and easily
- Total UCANR websites = 732 (ucanr.edu/sites)
- Agronomy Research and Information Center
 - “Central Hub” to refine search
 - Links to specific field crop information
 - Event announcements, blogs, updates
 - Nutrient management resources



agric.ucdavis.edu

Nutrient Management: Online Resources



- Solution Center for Nutrient Management

- Discussion forum
- Focus topics
- Research database

- California Fertilization Guidelines

- N, P, K management recommendations
- Field crops, vegetables and tree crops
- Extensive bibliography and compilation of crop nutrient removal rates



ucanr.edu/sites/Nutrient_Management_Solutions

Nitrogen concentrations in harvested plant parts - A literature overview



Daniel Geisseler

Table 1: Overview of N concentrations in harvested plant parts of field crops.

Commodity	N in harvested plant parts		# of observations		CV (%)	Page
			California	Total		
Alfalfa - Hay	62.3	lbs N/ton @ 12% moisture	49	49	12.5	14
Alfalfa - Silage	24.0	lbs N/ton @ 65% moisture	6	6	17.5	16
Barley - Grain	33.6	lbs N/ton @ 12% moisture	4	61	14.6	18
Barley - Straw	15.4	lbs N/ton @ 12% moisture	0	970	31.3	20
Beans, dry - Blackeye	73.0	lbs N/ton @ 12% moisture	1	164	10.4	22
Beans, dry - Garbanzo	67.2	lbs N/ton @ 12% moisture	2	108	11.3	24
Beans, dry - Lima	72.3	lbs N/ton @ 12% moisture	2	75	5.4	26
Corn - Grain	24.0	lbs N/ton @ 15.5% moisture	0	1775	20.8	28
Corn - Silage	7.56	lbs N/ton @ 70% moisture	71	71	10.5	30
Cotton	43.7	lbs N/ton lint & seed	27	80	29.5	32
Fescue, Tall - Hay	50.8	lbs N/ton @ 12% moisture	260	260	16.2	34
Oat - Grain	37.7	lbs N/ton @ 12% moisture	0	134	9.6	36
Oat - Straw	14.8	lbs N/ton @ 12% moisture	2	526	34.7	38
Oat - Hay	21.7	lbs N/ton @ 12% moisture	49	49	18.2	40
Orchard Grass - Hay	54.5	lbs N/ton @ 12% moisture	60	60	20.0	42
Ryegrass, Perennial - Hay	54.9	lbs N/ton @ 12% moisture	60	60	16.8	44
Safflower	56.8	lbs N/ton @ 8% moisture	12	149	20.0	46
Sorghum - Grain	33.0	lbs N/ton @ 13.5% moisture	0	256	29.7	48
Sorghum - Silage	7.34	lbs N/ton @ 65% moisture	260	260	21.0	50
Sunflower	54.1	lbs N/ton @ 8% moisture	0	208	14.3	52
Triticale - Grain	40.4	lbs N/ton @ 12% moisture	51	51	13.0	54
Triticale - Straw	11.5	lbs N/ton @ 12% moisture	0	102	38.3	56
Triticale - Silage	9.03	lbs N/ton @ 70% moisture	19	19	13.7	58
Wheat, common - Grain	43.0	lbs N/ton @ 12% moisture	113	113	10.3	60
Wheat - Straw	13.8	lbs N/ton @ 12% moisture	3	494	33.0	62
Wheat - Silage	10.5	lbs N/ton @ 70% moisture	39	39	18.6	64
Wheat, durum - Grain	42.1	lbs N/ton @ 12% moisture	41	41	3.7	66

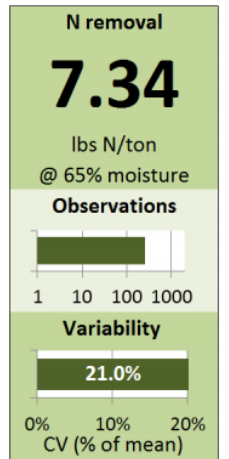
Sorghum – Silage

Data sources

The data included in this report are from a variety trial conducted at two locations in Fresno County over three years. A large number of varieties were included. With no information available about the most widely used sorghum varieties in California, the entire dataset from the trial was used in this report. As protein content was reported, it was divided by 6.25 to calculate N values for this report.

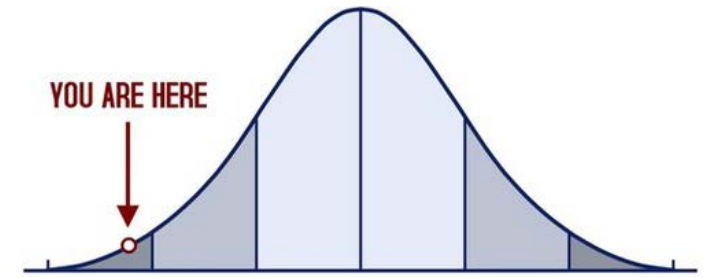
Relevance

The trial was carried out at two locations in the Central Valley with a large number of varieties over a period of three years. The average N concentration can be considered a good estimate of N concentrations found in sorghum silage produced in the Central Valley.



Nutrient Management: Decision-Support Tools

- Crop nutrient removal rates are variable
- General guidelines “aim for the middle”
- Further refinement requires site-specific information
- Decision support tools integrate user-supplied inputs
 - Spreadsheet calculators, web-based applications, online databases





Geisseler Lab

Nutrient Management



Home

Nitrogen calculator for processing tomatoes

Test version

Field-Specific Input

Planting date:

Expected harvest date:

Expected Yield: tons/acre

Residual nitrate in 1st foot: ppm Nitrate-N ▼

Residual nitrate in 2nd foot: ppm Nitrate-N ▼

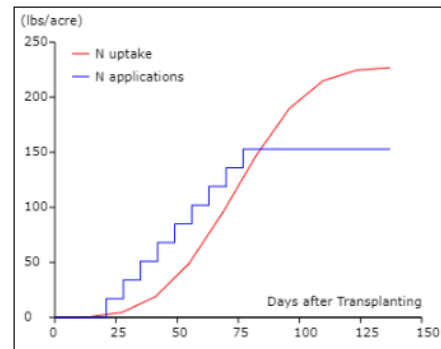
Nitrate in irrigation water: ppm Nitrate-N ▼

Estimated total irrigation: acre-inches

Starter/preplant fertilizer: lbs N/acre ▼

Display Results/Changes

Nitrogen Uptake and Applications



The graph and the calculations are based on N uptake data from commercial fields in the Central Valley. Weather conditions, management and variety selection all can affect N uptake and availability. It is therefore **important to monitor the N status of the field during the season with soil or leaf analyses**. More information about soil and leaf sampling can be found [here](#).

Nitrogen Budget

Estimated N uptake:	<input type="text" value="225 lbs/acre"/>
In-season N mineralization:	<input type="text" value="46 lbs/acre"/>
Available residual nitrate:	<input type="text" value="57 lbs/acre"/>
Nitrate in irrigation water:	<input type="text" value="0 lbs/acre"/>
Starter N applied:	<input type="text" value="0 lbs/acre"/>
Assumed fertilizer N use efficiency:	<input type="text" value="80%"/>
In-season fertigation N needed:	<input type="text" value="153 lbs/acre"/>

Suggested In-Season Fertigations

First fertigation:	<input type="text" value="after 3 weeks"/>
Number of weekly fertigations:	<input type="text" value="9 times"/>
Last fertigation:	<input type="text" value="after 11 weeks"/>
Amount of N applied each time:	<input type="text" value="17 lbs/acre"/>

Nutrient Management: Decision-Support Tools

- CropManage
- Seamlessly integrates multiple inputs:
 - Location, crop, soil nitrate, irrigation system
 - Soil properties, weather information, etc.
- Generate site-specific, weather-based irrigation and nitrogen fertilization schedule
- Web-based platform for ease of communication
 - Currently supports vegetable and berry crops
 - Future support of field crops



Questions?

Anthony M. Fulford

UCCE Modesto

209.525.6825

amfulford@ucanr.edu

cestanislaus.ucanr.edu

Joy Hollingsworth

UCCE Fresno

559-241-7527

joyhollingsworth@ucanr.edu

cefresno.ucanr.edu



UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

Cooperative Extension