

# Final Report

## A. Project Information

**Project Title:** Nutrient Management and Irrigation Efficiency Outreach and Education for Latino and Southeast Asian Farmers

**Project leaders:** Deborah Nares, CA Senior Manager, American Farmland Trust,

**Grant Number:** 21-0573-000-SA

**Project Duration:** Start Date: 1/1/2022, End Date: 12/31/2024

Email and Phone, [dnaresparedes@farmland.org](mailto:dnaresparedes@farmland.org); 831-769-6385

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## B. Abstract

American Farmland Trust (AFT) with partners, including Asian Business Institute and Resource Center (ABIRC) and Cachuma Resource Conservation District (CRCD), collaborated on-farm tailgates, radio broadcasts, business development trainings and economic predictive assessments to support enhanced resource access, provider capacity and connectivity, knowledge gains, and practice implementation among small-scale diversified operators.

These activities featured best practices, local technical assistance (TA) and resource providers to deliver educational programming that is often lacking among small-scale underserved farming communities. The connection with TA providers was deepened in the topic areas of nutrient management principles and business skills.

In this last year of this project AFT staff and partners adapted and translated FREP materials to be inclusive and responsive to needs among culturally and linguistically diverse farmers, including into Spanish and Hmong, as well as to the needs of those with different levels of literacy, numeracy, and agronomic understandings and diverse management practices, in addition to implementing additional on-farm tailgates, radio broadcasts, and business development trainings.

## C. Introduction

The project addressed a central problem of a lack of TA and resources available in the primary languages of California growers and farm workers, while also addressing the inherent complications in optimizing fertilizer application and irrigation efficiency as well as overcoming the financial obstacles in adopting changes and conservation practices to achieve enhanced nutrient management and irrigation efficiency. While there are

many Spanish-speaking TA providers in California, there are not enough to meet the needs of the magnitude of Latino farmers, ranchers, and farm workers who do not speak English fluently.

Eleven on-farm tailgates were conducted to serve Hmong and Latino growers and farm workers in the San Joaquin Valley, the Central Coast, and Southern California. Each were facilitated in either Spanish or Hmong, depending on the grower and farm worker audience in Fresno, Riverside and Santa Barbara County. Each focused on providing technical information to growers and demonstrating efficient fertilizer selection, application, and timing; adoption of practices of compost application, cover cropping, and other soil health management practices. The tailgates collectively reached 204 growers, for an average of 19 growers per tailgate. The tailgates also allowed producers to make direct and potentially lasting connections with local TA providers, including agricultural consultants that speak their primary.

Four business skills learning modules were conducted in Hmong with ABRIC partners and also adapted into Spanish starting with basic concepts and incrementally increase with each session based on the learning of the previous modules. Predictive assessments were made using AFT's Soil Health Economic Case Studies protocol, which demonstrates costs and benefits of implementing practices and changes in nutrient management. These tools gave growers the information they need to feel confident that their use of soil health practices will benefit them in a culturally appropriate cropping system. Fifteen radio broadcasts reached many Spanish-speaking growers and farm workers with topics on regenerative practices and water conservation education. This was effective in widely distributing information, gaining the interest of growers and farm workers in enhancing regenerative agriculture management, and in seeking further TA as a result.

The project used the FREP fertilization guidelines to develop the recordkeeping for nutrient management curriculum in the business skills modules and tailgate sessions as well as predictive assessment tools that were translated into Spanish to distribute for outreach and educational materials for tailgates and support a wider audience of technical service providers working with the Latino farming community (California Department of Food and Agriculture).

#### D. Objectives

Objective 1: Increase nutrient management and irrigation efficiency TA services and information distribution for underserved farmers and farm workers.

Objective 2: Increase management efficiencies and adoption of sustainable nutrient management and irrigation efficiency practices.

## E. Methods

Methods for working with underserved producers in the Latino and Southeast Asian communities were met by:

- Hiring local bilingual AFT field staff that could connect in a culturally and linguistically appropriate manner and would be able to develop relationships between outreach and education events.
- Partnering with local partners that are in community with Hmong speakers
- Developing basic level soil health tailgates and business skills trainings in Spanish and/or Hmong that were responsive to the specific cropping systems and needs of the producers
- Understanding and listening to producers' needs/challenges and responding and adapting to their specific needs to develop the next phases of TA and trainings.
- Using moisture sensor tools, Nitrate quick tests and soil probes to aid in soil health practice implementation.

## F. Data/Results

### Objective 1:

Increase nutrient management and irrigation efficiency TA services and information distribution for underserved farmers and farm workers.

Tasks:

1. Translation of materials
2. Farmer tailgates

Results for each task:

1. *Translation of materials:* The project used predictive assessments using AFT's Soil Health Economic Case Studies protocol, which demonstrates costs and benefits of implementing practices and changes in nutrient management. These tools gave growers the information they need to feel confident that their use of soil health practices will benefit them in a culturally appropriate cropping system that were translated resources into Spanish to distribute for outreach and educational materials for tailgates and support a wider audience of technical service providers working with the Latino farming community. These assessments were carefully chosen to reflect the demographic of farmers this project intended to serve and their cropping systems. (see attached predictive assessment tools in English & Spanish).
2. *Farmer Tailgates:* Eleven tailgates were conducted to serve the southeast Asian and Latino growers in the San Joaquin Valley, the Central Coast, and Southern California regions. These events were facilitated in either Spanish or Hmong, depending on the grower audience and focused on providing technical information

on fertilizer selection, application, and timing. These tailgates collectively reached 204 growers and allowed them to make direct and lasting connections with local TA providers, including agricultural consultants that speak their primary languages. The topics were centered on soil health and water conservation management on small scale farming operations. Local technical assistance providers from the NRCS, FSA, East Stanislaus RCD, East Merced RCD, California Farmlink and ABIRC and local lenders were invited to connect with farmers in their preferred language to describe their services. Moisture sensor tools, Nitrate quick tests and soil probes were used to demonstrate in soil health practice implementation. Producers were shown how and when to use these in field methods and were provided tools and assistance during and after the tailgate events.

### Objective 2:

Increase management efficiencies and adoption of sustainable nutrient management and irrigation efficiency practices

Tasks:

1. Production of radio show broadcasts
2. Business Skills Training

Results for each task:

1. *Production of radio show broadcasts:* AFT partnered with Radio Bilingue, a radio broadcaster that provides culturally relevant programming to rural communities in Spanish, to produce 15 radio shows on various soil, water, and nutrient management-related topics, including various best management practice implementation, irrigation efficiency, business skills, farm viability, and local farming issues with various technical assistance providers and specialists throughout California. These radio shows were recorded and uploaded to the AFT You Tube channel where it will be accessible to the Latino farming community and any other service providers working with Spanish speaking producers. (see link to YouTube and attached list of radio shows)
2. *Conduct Business Skills Training:* Four business skills trainings modules were carried out in the Fresno region with Hmong growers and in the Santa Maria region and Riverside County with Latino growers in Spanish and delivered to 204 growers. These business skills sessions were modeled after project partner, ABIRC's curriculum for Hmong farmers and adapted to support Latino producers and delivered in Spanish. Basic bookkeeping practices were discussed and workshop participants were provided with binders to keep their monthly expense receipts and organize financial records. Each time the business skills training was delivered, staff recognized the opportunity to advance the content slightly and provide producers tailored management practices based on 1:1 conversation. This method has proven to be successful as it demonstrates collaboration between service providers and producers trust that the content is

being culturally adapted to the specific community needs. (see attached corresponding flyers, sign in sheets, pictures for each event)

Material deliverables during this project were:

1. *Record keeping for Nutrient Management* curriculum created in Spanish and translated to English and adapted each year based on the regional needs of the communities served by this project.
2. 5 Predictive Assessments using AFT's soil health economic calculator tools, on 5 farmers growing 4 crops in 2 growing areas, with findings that support an average of +\$393/acre of potential net gain from implementing soil health practices. This has led to improved farmer familiarity with the financial impacts associated with various soil, water, and nutrient management practices and better comfort and reduced perception of risk in knowing the potential costs and benefits upfront. These activities took place on a 1-on-1 basis and demonstrated as part of the tailgates (which ones) to extend the learnings. Each of the 5 participating farmers are small scale underrepresented farmers that are relevant to local underserved communities this project intended to serve. Additionally, the predictive assessments were translated from English to Spanish which will serve as case studies in future outreach and educational programs.
  - a. Ybarra Farms, a citrus grower in Tulare, CA
  - b. Balbir Singh, a raisin grape grower in Tulare, CA
  - c. Vicky Garcia Moya, an almond grower in Madera, CA
  - d. Baljit Batth an almond grower in Tulare, CA
  - e. Vivian Hwang a Napa cabbage grower in Fresno, CA
3. 15 radio show interviews recorded and posted on the AFT YouTube channel in Spanish on the following topics:
  - a. Healthy Soils on Scale Farms by AFT
  - b. Irrigation Management by Cachuma Resource Conservation District
  - c. Transition to Organic by California Certified Organic Foundation
  - d. Challenges and advice from a farmer/owner by Angie Bulgarin
  - e. Small Farm Tech Expo and Programs by Community Alliance with Family Farmers
  - f. Nutrient Management and Conservation Planning by AFT/AGQ Labs
  - g. Business Skills Development by David Mancera, Farm Business Advisor
  - h. Nutrient Management/Conservation Planning by AFT
  - i. Business Skills Development and Programs by California Farmlink
  - j. Access to Capital & AFT Services for Small Scale Farmers by AFT
  - k. Irrigation Management by Cachuma Resource Conservation District
  - l. Nutrient Management and Programs by USDA Rural Development

- m. Challenges and advice from a farmer/owner by Vanessa Perez
- n. Healthy Soils by ABIRC (Radio Hmong)
- o. Nutrient Management/Conservation Planning by American Farmland Trust

### Impact Measures

1. Evaluations were conducted for some of the tailgates and business skills modules given in Hmong and in Spanish. While there were high participation, involvement and enthusiasm of farmers at these events there was low rate of response to the surveys that were provided in written form, a total of 4 surveys were collected from individual farmers. Therefore, AFT staff and partners collectively decided to conduct verbal surveys asking farmers about their understanding on the various topics at the start of the tailgates and followed up with discussion of what was most important in their learnings and what they would like to learn more about, including how producers prefer to learn and absorb information. The response using this verbal and conversational method was remarkably well received as it allowed for the comments to be a source of peer learning within the farmer community as well for the practitioners in the room. (see attached surveys).

2. As a result of these surveys and conversation feedback the following lessons and adjustments were made throughout the project and will be valuable for continued engagements beyond this project:

- When asking for farmer surveys, add incentives such as relevant tools (e.g. test kits for Nitrogen testing, etc.) and/or gas cards/honorariums. This demonstrates the value of their participation and feedback instead of simply extracting farmer knowledge and information.
- When delivering first round of educational tailgates and business modules, start with basic level topics, then increase the level of complexity in the next round and later offer 1:1 or small group working groups to deepen the level of assistance.
- When offering tailgates and business modules with 2 different subject matters, combining the 2 topics in one day allows all participants to experience the various content being offered instead of having to return another day to a different topic.

## G. Discussion and Conclusions

The project goals began with providing basic level training in nutrient management education and business skills in the original language of the communities most in need of resources, including nutrient uptake, soil health concepts as well as bookkeeping best practices. During nutrient management tailgates, AFT lead presentations that centered the cropping systems of the producer participants and discussed their current fertilization methods. As relationships developed and trust was built in these farmer communities the tailgates focused more on learning how to read fertilizer labels and use FREP fertilizer guidelines.

This project has resulted in a deeper connection with key partnerships who have technical capacity related to nutrient, irrigation management and business development and that can support underserved farmer communities in California with the implementation of these management practices through developed curriculum, guides, and publications; enhanced service provider skills and capacity built through partners, and improved delivery of outreach, educational, and technical assistance programming; and enhanced understanding and connectivity between partners and farmers in navigating services, particularly in nutrient management, irrigation efficiency, and related areas from technical, economic, and farm viability lenses. AFT staff has adapted and prioritized culturally appropriate outreach efforts by hiring native Spanish speaking TA providers from the community for long lasting relationships that can increase practice adoption that has been successful in building trusting relationships with community members. A notable accomplishment has been AFT's increased capacity to impact best management practices within the Hmong and Latino community of farmers in the Fresno and Santa Maria areas as well as a strong reputation within the ecosystem of TA providers (public and private) in their respective areas. AFT was directly able to support implementation of best management practices by leveraging relationships with TA providers and connecting farmers to diverse funding resources that can pay for implementation of various conservation practices. AFT conducted a cost-benefit analysis of the following conservation practices in these cropping systems as published in the following case studies that were translated into Spanish as part of this project:

- a. Ybarra Farms, a citrus grower in Tulare, CA, that when implemented Compost application, nutrient management, irrigation water management, and renewable energy, experienced an associated +\$655 change in net income
- b. Balbir Singh, a raisin grape grower in Tulare, CA, that implemented cover crops, compost applications & nutrient management practices, experienced an associated +\$606/acre/year change in net income



- c. Vicky Garcia Moya, an almond grower in Madera, CA, that when implemented cover crops, compost, mulching, & nutrient management, experienced an associated +\$284/acre/year change in net income
- d. Baljit Batth, an almond grower in Tulare, CA, that implemented cover crops, compost applications & nutrient management practices, experienced an associated +\$420/acre/year change in net income.
- e. Vivian Hwang a napa cabbage grower in Fresno, CA, that when implemented compost applications practices, experienced an associated \$0/acre/year change in net income

## H. Challenges

Challenge	Corrective Action and/or Project Change/lessons learned
In many cases, growers came with diverse literacy, numeracy, and technology skills, which brought challenges in developing and implementing standardized recordkeeping and business development workshops.	AFT and partners found it important to understand the various levels growers to support and target development of curricula, and educational delivery. In all cases, baselines were understood, and foundational levels were taught with deeper learnings followed up in small group or 1-on-1 settings. This foundational level starting point was effective in creating a common level for all participating farmers to operate from and worked well as the content progressed and farmer skills advanced over the time of the project. This tailored approach with regular refinement was responsive to diverse farmer needs and successfully addressed the challenges associated with farmers coming with divergent skill levels.

## I. Project Impacts

The main impacts of this project have been a seen in the relationship forged with local partners providing technical assistance that have both technical and language capacity in the Santa Maria and San Joaquin Valley areas. This has allowed AFT and partners to be more effective in the decimation of education and ultimately the adoption of both nutrient management and business skills practices with farmers that have historically been underrepresented and marginalized due to lack of resources. This is evident when farmers reach out to the AFT team for related and sometimes unrelated questions regarding their farm business. Farmers in these regions are associating AFT programs with expertise in nutrient management, irrigation efficiency and business skill assistance which is key for future program development.



## J. Outreach Activities Summary

<b>Event Name (1)</b>	Water and Nutrient management in Spanish		
<b>Presentation title</b>	Drought Impacts to Small Scale farmers, Water and Soil Conservation practices and Resource Fair		
<b>Location and date</b>	FRESNO/SEP/2022		
<b>Attendee demographics</b> (CCAs, PCAs, growers, consultants, researchers, etc.)	55% Hmong, 45% Latino, growers		
<b>CCA/Grower Continuing Education Units (CEUs) offered</b>	n/a	<b>Number of participants</b>	26

<b>Event Name (2)</b>	Irrigation & Nutrient management & transition to organic in Spanish		
<b>Presentation title</b>	Irrigation & Nutrient management & transition to organic in Spanish		
<b>Location and date</b>	SANTA MARIA OCT/2022		
<b>Attendee demographics</b> (CCAs, PCAs, growers, consultants, researchers, etc.)	100% Latino, growers		
<b>CCA/Grower Continuing Education Units (CEUs) offered</b>	n/a	<b>Number of participants</b>	25

<b>Event Name (3)</b>	Local TA & FA/Farm Tour		
<b>Presentation title</b>	Recordkeeping for Nutrient Management		
<b>Location and date</b>	FRESNO, OCT/2022		
<b>Attendee demographics</b> (CCAs, PCAs, growers, consultants, researchers, etc.)	100% Hmong, growers		
<b>CCA/Grower Continuing Education Units (CEUs) offered</b>	n/a	<b>Number of participants</b>	

<b>Event Name (4)</b>	Recordkeeping for Nutrient Management		
<b>Presentation title</b>	Recordkeeping for Nutrient Management		
<b>Location and date</b>	FRESNO/March/2023		
<b>Attendee demographics</b> (CCAs, PCAs, growers, consultants, researchers, etc.)	100% Hmong, growers		
<b>CCA/Grower Continuing Education Units (CEUs) offered</b>	n/a	<b>Number of participants</b>	14

<b>Event Name (5)</b>	Recordkeeping for Nutrient Management		
<b>Presentation title</b>	Recordkeeping for Nutrient Management		
<b>Location and date</b>	FRESNO/April/2023		
<b>Attendee demographics</b> (CCAs, PCAs, growers, consultants, researchers, etc.)	100% Hmong Growers		
<b>CCA/Grower Continuing Education Units (CEUs) offered</b>	n/a	<b>Number of participants</b>	13

<b>Event Name (6)</b>	Transition to organic and market opportunities		
<b>Presentation title</b>	Transition to organic and Marketing Tips		
<b>Location and date</b>	Merced/Aug/2023		
<b>Attendee demographics</b> (CCAs, PCAs, growers, consultants, researchers, etc.)	90% Latino Growers and 10% Asian Growers		
<b>CCA/Grower Continuing Education Units (CEUs) offered</b>	n/a	<b>Number of participants</b>	28

<b>Event Name (7)</b>	Recordkeeping for Nutrient Management		
<b>Presentation title</b>	Recordkeeping for Nutrient Management		
<b>Location and date</b>	Santa Maria/Nov/2023		
<b>Attendee demographics</b> (CCAs, PCAs, growers, consultants, researchers, etc.)	100% Latino, growers		
<b>CCA/Grower Continuing Education Units (CEUs) offered</b>	n/a	<b>Number of participants</b>	20

<b>Event Name (8)</b>	Nutrient Management and Basic Recordkeeping		
<b>Presentation title</b>	Nutrient Management and Basic Recordkeeping		
<b>Location and date</b>	Santa Maria/Oct/24		
<b>Attendee demographics</b> (CCAs, PCAs, growers, consultants, researchers, etc.)	100% Latino		
<b>CCA/Grower Continuing Education Units (CEUs) offered</b>	n/a	<b>Number of participants</b>	9

<b>Event Name (9)</b>	Business Credit & Soil Health		
<b>Presentation title</b>	Business Credit & Soil Health		
<b>Location and date</b>	Fresno/Sep/2024		
<b>Attendee demographics</b> (CCAs, PCAs, growers, consultants, researchers, etc.)	80% Asian & 20% Latino		
<b>CCA/Grower Continuing Education Units (CEUs) offered</b>	n/a	<b>Number of participants</b>	18

<b>Event Name (10)</b>	Achieve effective negotiations & Fair Marketing Practices		
<b>Presentation title</b>	Achieve effective negotiations & Fair Marketing Practices		
<b>Location and date</b>	Inland Empire/Oct/2024		
<b>Attendee demographics</b> (CCAs, PCAs, growers, consultants, researchers, etc.)	90% Latino, 5% White, & 5% Black		
<b>CCA/Grower Continuing Education Units (CEUs) offered</b>	n/a	<b>Number of participants</b>	20

<b>Event Name (11)</b>	Business Credit and Soil Nutrition Health		
<b>Presentation title</b>	Business Credit and Soil Nutrition Management		
<b>Location and date</b>	Fresno/Nov/2024		
<b>Attendee demographics</b> (CCAs, PCAs, growers, consultants, researchers, etc.)	100% Hmong, growers		
<b>CCA/Grower Continuing Education Units (CEUs) offered</b>	n/a	<b>Number of participants</b>	21

<b>Event Name (12)</b>	Recordkeeping for Nutrient Management		
<b>Presentation title</b>	Recordkeeping for Nutrient Management		
<b>Location and date</b>	Santa Maria/Nov 24		
<b>Attendee demographics</b> (CCAs, PCAs, growers, consultants, researchers, etc.)	Latinos 100%		
<b>CCA/Grower Continuing Education Units (CEUs) offered</b>	n/a	<b>Number of participants</b>	24

## K. References

California Department of Food and Agriculture. 2025. *California Crop Fertilization Guidelines*. Official website of the State of California.

<https://www.cdfa.ca.gov/is/fldrs/frep/FertilizationGuidelines/>

## L. Appendix

See attachments.

## M. Fact Sheet

### 1. Project Information

Project Title: Nutrient Management and Irrigation Efficiency Outreach and Education for Latino and Southeast Asian Farmers

Project leaders: Deborah Nares, CA Senior Manager

Grant Number: 21-0573-000-SA

Project Duration: Start Date: 1/1/2022, End Date: 12/31/2024

Location: San Joaquin Valley, Santa Maria and Inland Empire

County: Fresno, Santa Barbara and Riverside Counties

### 2. Highlights

- Strengthened and broadened outreach strategies by hiring an Outreach Specialist to deepen relationships in underserved communities. Including a successful radio broadcast series in Spanish that reached rural communities in 3 geographical areas of priority on topics related to soil health and regenerative agricultural practices.
- Provided increase technical assistance and education on topics of business skills and soil health in Spanish and Hmong with the Latino and southeast Asian producer communities
- Developed a curriculum (or module) for 'Recordkeeping for Nutrient Management' that combines basic record keeping practices with nutrient budgeting by understanding fertilizer label applications, soil and water lab test results and Nitrogen crop needs.
- Developed and translated 5 predictive assessments into Spanish that demonstrates the potential economic gains of implementing regenerative practices

### 3. Introduction

This project addresses a lack of TA and resources available in the primary languages of California producers which lead to obstacles in adopting conservation practices to achieve nutrient management and irrigation efficiency. While there are many Spanish-speaking TA providers in California, there are not enough to meet the needs of the magnitude of Latino farmers who do not speak English fluently.

Eleven on-farm tailgates were conducted to serve the southeast Asian and Latino growers in the San Joaquin Valley, the Central Coast, and Southern California facilitated in either Spanish or Hmong, depending on the grower audience and focused on providing technical information on fertilizer selection, application, and timing. These tailgates collectively reached 204 growers and allowed them to make direct and lasting connections with local TA providers, including agricultural consultants that speak their primary languages.

Predictive assessments were done using AFT's Soil Health Economic Case Studies, which demonstrates costs and benefits of implementing practices and changes in nutrient management. These case studies give growers the information they need to feel confident that their use of soil health practices will benefit them in a culturally appropriate cropping system.

Four business development trainings modules were carried out in the Fresno region with Hmong growers and in the Santa Maria region with Latino growers in Spanish and delivered to 204 growers.

Fifteen radio broadcasts reached many Spanish-speaking growers and farm workers with topics on regenerative practices and water conservation education. This was effective in widely distributing information, gaining the interest of growers and farm workers in enhancing regenerative agriculture management, and in seeking further TA as a result.

Additionally, the project developed new and translated resources to support and distribute within the grower and farm workers served in the project and to a wider audience online.

### 4. Methods & Management

Methods for working with underserved producers in the Latino and southeast Asian communities were met by:

- Hiring local bilingual AFT field staff that could connect in a culturally and linguistically appropriate manner and would be able to develop relationships between outreach and education events.
- Partnering with local partners that are in community with Hmong speakers

- Developing basic level soil health tailgates and business skills trainings in Spanish and/or Hmong that were responsive to the specific cropping systems and needs of the producers
- Understanding and listening to producers' needs/challenges and responding and adapting to their specific needs to develop the next phases of TA and trainings.
- Using moisture sensor tools, Nitrate quick tests and soil probes to aid in soil health practice implementation.

## 5. Findings

This project has resulted in a deeper connection with key partnerships who have technical capacity related to nutrient, irrigation management and business development and that can support underserved farmer communities in California with the implementation of these management practices. AFT staff has adapted and prioritized culturally appropriate outreach efforts by hiring native Spanish speaking TA providers from the community for long lasting relationships that can increase practice adoption. A notable accomplishment has been AFT's increased capacity to impact best management practices within the Hmong and Latino community of farmers in the Fresno and Santa Maria areas as well as a strong reputation within the ecosystem of TA providers (public and private) in their respective areas.