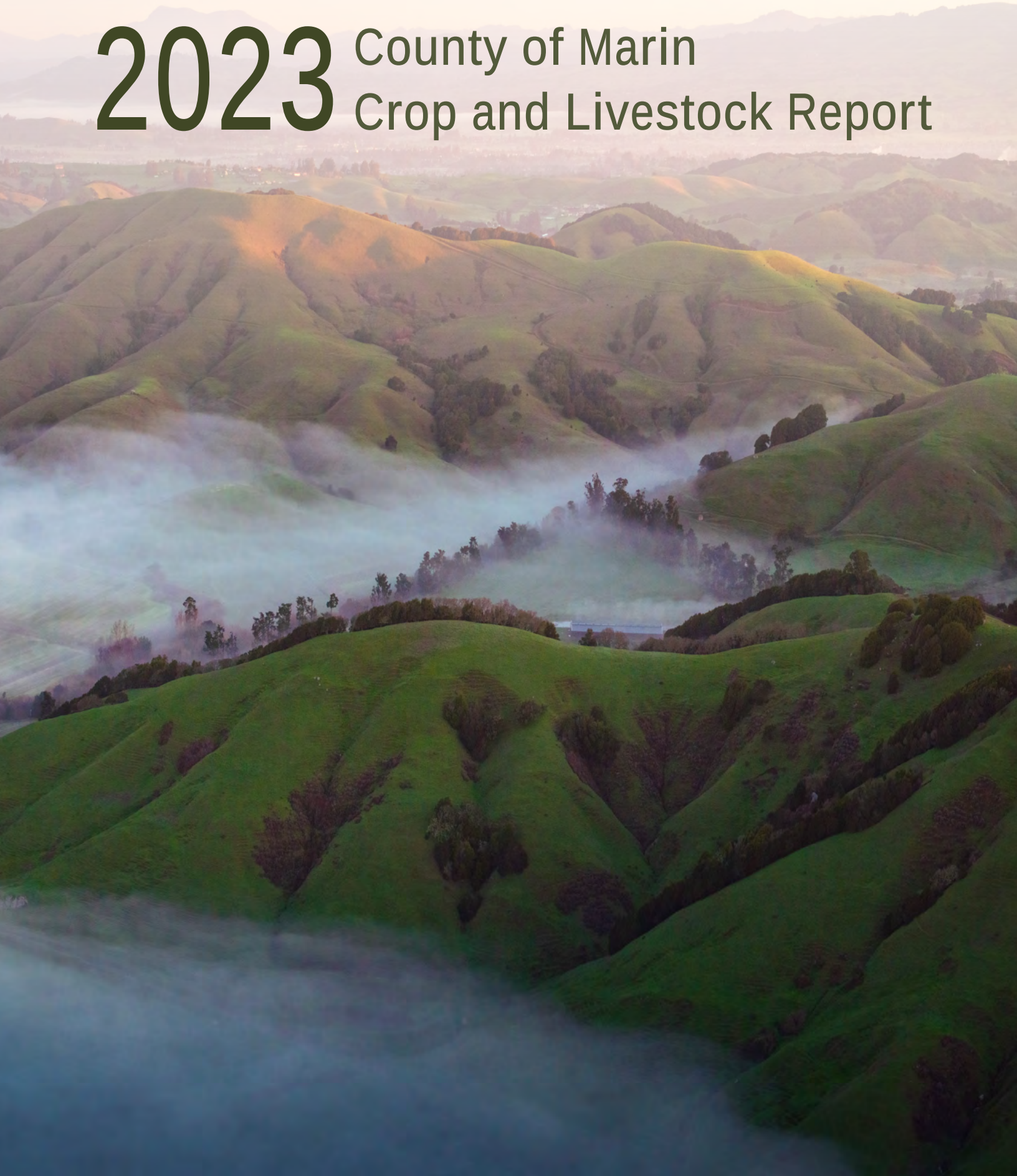
2023 County of Marin Crop and Livestock Report



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ACKNOWLEDGEMENTS

Special thanks to Orlena Yee, Marin Carbon Project Coordinator, for facilitating and authoring this year's article on climate-smart agriculture, which appears in both Marin and Sonoma County's Crop and Livestock Reports.

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Cover photo: Hicks Valley (by Jeff Lewis)

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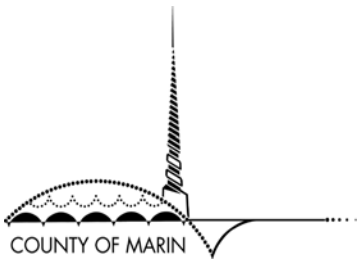


Joe Deviney, Commissioner/Director

It is my privilege to present the 2023 Marin County Crop and Livestock Report. This report is prepared in accordance with Sections 2272 and 2279 of the California Food and Agricultural Code and summarizes the acreage, production, and gross value of agricultural products produced in Marin County.

The total gross value of Marin County's agricultural production for 2023 was $85,311,000, a decrease of 9% from the 2022 value of $94,147,000. It is important to note that the figures provided here are gross values and do not represent nor reflect net profit or loss experienced by individual growers or the industry as a whole.

Poultry, valued at $24,623,000, was the top grossing agricultural commodity; its value increased by 5% from 2022. Organic milk ranked second in value, decreasing 32% to $21,890,000. While the number of organic dairies remain the same, total organic milk production decreased 25% and prices also decreased. Cattle was third in value totaling $14,840,000. The value of field crops increased 17%, due in part to winter precipiation which ended three years of persistent drought and increased production. The value of winegrapes rose 11% to $919,000.

This year's report includes a feature article on Climate-Smart Agriculture in Marin and Sonoma County. Building strong partnerships between farmers and ranchers and the local institutions that support them are critical to creating climate resilient agricultural landscapes. These organizations, many of which work across the county line, are leading the advancement of agriculture as a climate solution.

Special recognition for the production of this report goes to Allison Klein and Orlena Yee, as well as all of the staff who assisted in compiling and analyzing the information. I would like to express my appreciation to individuals, growers, government agencies, and others who contributed the information necessary to prepare this report.

Respectfully submitted,

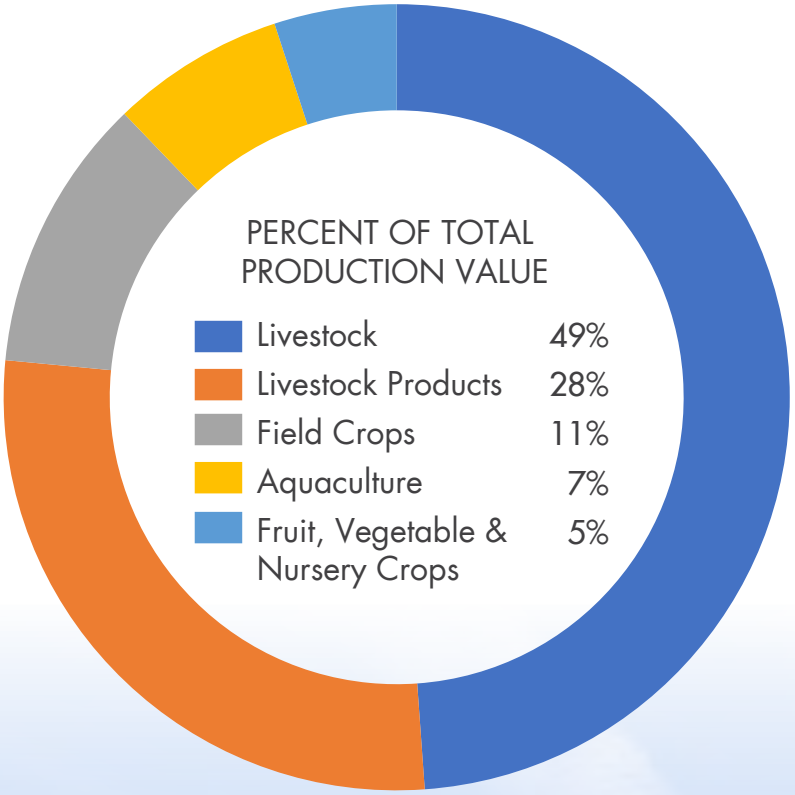
Joe Deviney
Agricultural Commissioner
Director of Weights & Measures

Agricultural Production Summary

The gross value of all agricultural production in Marin County for 2023 was approximately

$85,311,000

which represents a decrease of approximately 9% compared to the 2022 gross value of $94,147,000.



TEN YEAR SUMMARY

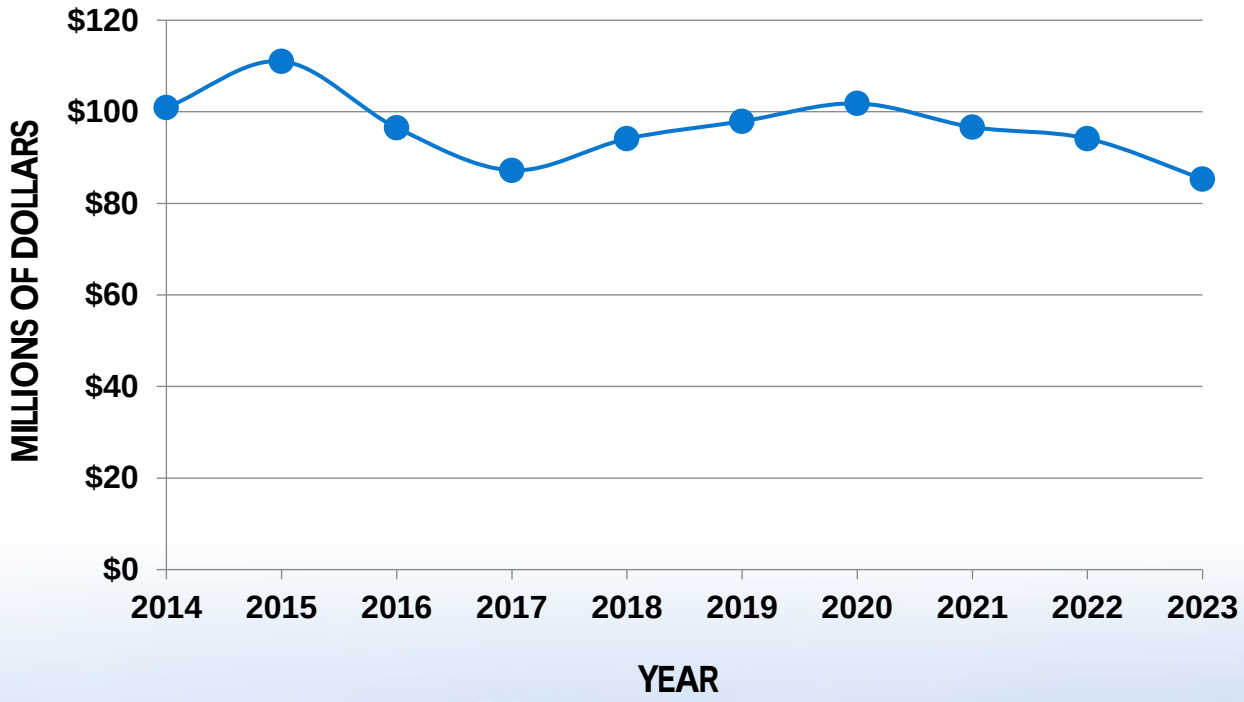


Photo by Paige Green: Bivalve Dairy

While the gross value for cattle and sheep decreased in 2023, poultry and aquaculture increased.

Livestock & Aquaculture

	Year	Number of Head	Price per Head	Total Gross Value
Cattle	**2023**	**10,600**	**$1,400**	**$14,840,000**
	2022	13,400	$1,120	$15,028,000
Sheep	**2023**	**11,000**	**$202**	**$2,222,000**
	2022	12,000	$243	$2,916,000
Poultry*	**2023**	**N/A**	**N/A**	**$24,623,000**
	2022	N/A	N/A	$23,382,000
Aquaculture†	**2023**	**N/A**	**N/A**	**$6,100,000**
	2022	N/A	N/A	$5,975,000

**Poultry figures include poultry fryers, pigeons, and chicken and duck eggs for consumption.*
†Aquaculture value based on report prepared by California Department of Fish and Wildlife. Aquaculture figures include oysters, mussels, and clams.

Both milk and wool experienced a decrease in production in 2023.

Livestock Products

	Year	Production	Price per Unit	Total Gross Value
Milk (Organic)	**2023**	**796,000 cwt.**	**$27.50**	**$21,890,000**
	2022	1,073,000 cwt.	$29.85	$31,975,400
Milk (Conventional)	**2023**	**85,500 cwt.**	**$19.50**	**$1,667,000**
	2022	112,300 cwt.	$18.60	$2,089,000
Wool	**2023**	**24,000 lbs.**	**$1.10**	**$26,000**
	2022	30,400 lbs.	$1.01	$30,700

Note: *Totals in the above charts may not calculate due to rounding.*

Photo by department staff: leafy greens growing in a field

Increased rainfall contributed to vegetation growth, as evidenced by the rise in yield per acre of hay production.

Field Crops

	Year	Harvested Acreage	Production	Price per Unit	Total Gross Value
Hay*	2023	1,115	2,800 tons	$153	$427,000
	2022	1,015	1,732 tons	$137	$237,000
Silage	2023	1,000	8,100 tons	$55	$445,000
	2022	1,145	10,184 tons	$61	$621,000
Pasture	2023	154,000	N/A	$57	$8,778,000
	2022	154,000	N/A	$48	$7,392,000

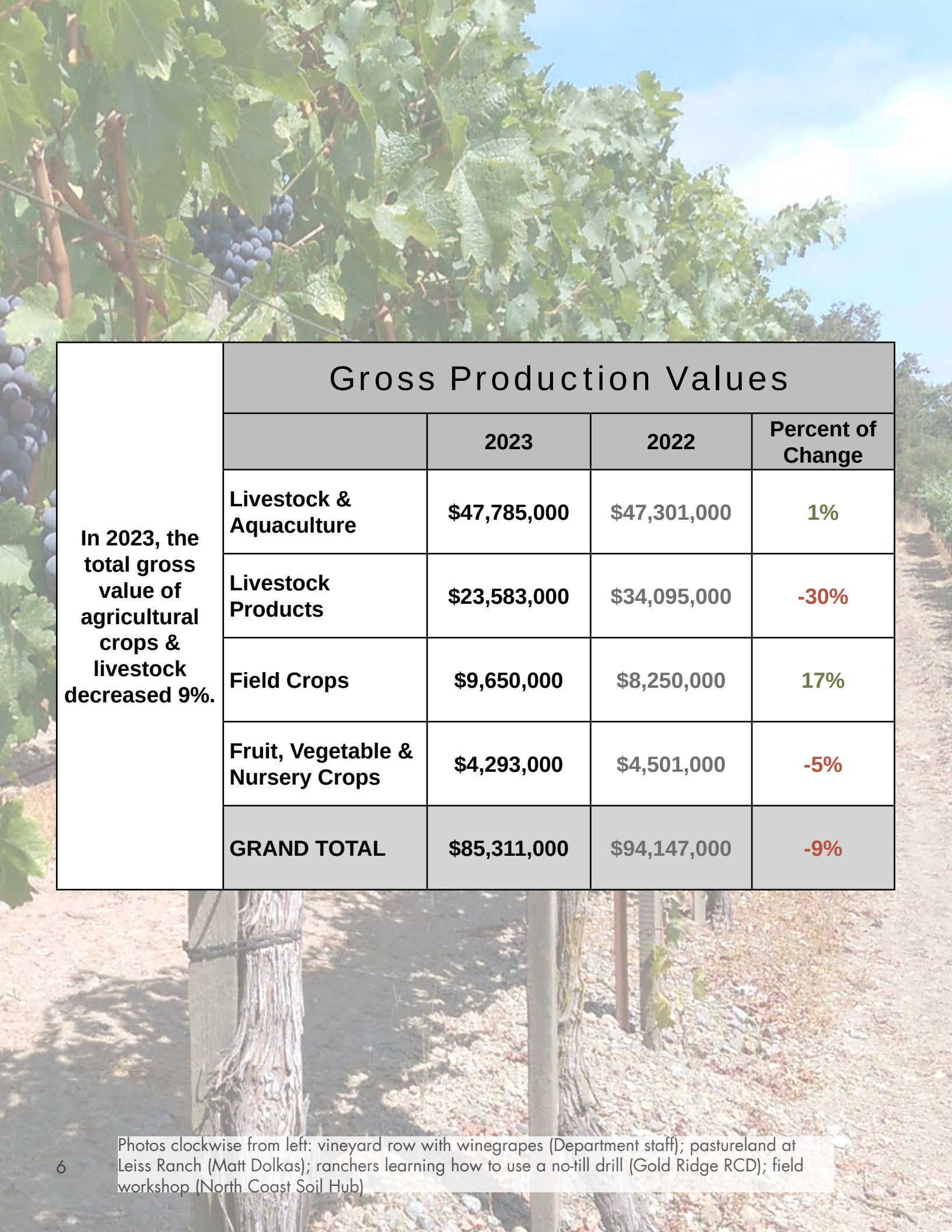
**Hay values include rye and oat hay.*
Much of the hay and silage is not sold, but used on the farm.

While the harvested acres of winegrapes decreased, the average price per ton of both red and white winegrapes rose in 2023.

Fruit, Vegetable & Nursery Crops

	Year	Planted Acres	Harvested Acres	Production	Total Gross Value
Fruits & Vegetables*	2023	233	250	N/A	$3,164,000
	2022	248	270	N/A	$3,400,000
Grapes, Wine†	2023	143	137	240 tons	$919,000
	2022	153	145	245 tons	$831,000
Nursery Products‡	2023	6.5	N/A	N/A	$210,000
	2022	6	N/A	N/A	$270,000

Note: *Totals in the above charts may not calculate due to rounding.*
**Following the USDA National Agricultural Statistics Service methodology for Acreage Harvested, acreage harvested and planted repeatedly during the year for vegetables is counted each time.*
†Planted Acres for winegrapes reflects bearing acres.
‡Nursery Product values include nursery stock and cut flowers.



In 2023, the total gross value of agricultural crops & livestock decreased 9%.

Gross Production Values

	2023	2022	Percent of Change
Livestock & Aquaculture	$47,785,000	$47,301,000	1%
Livestock Products	$23,583,000	$34,095,000	-30%
Field Crops	$9,650,000	$8,250,000	17%
Fruit, Vegetable & Nursery Crops	$4,293,000	$4,501,000	-5%
GRAND TOTAL	$85,311,000	$94,147,000	-9%

Photos clockwise from left: vineyard row with winegrapes (Department staff); pastureland at Leiss Ranch (Matt Dolkas); ranchers learning how to use a no-till drill (Gold Ridge RCD); field workshop (North Coast Soil Hub)

Stewardship in Practice:
Climate-Smart Agriculture in Marin & Sonoma County

by Orlena Yee, Marin Carbon Project Coordinator

Partnerships in Agriculture Leads to Climate Benefits and Solutions

Farmers and ranchers are experiencing the impacts of climate change on their operations through shifts in weather patterns and the severity and frequency of storms, floods, droughts, and wildfires. Known for their innovation, resilience, and community-building efforts, producers in this region are also leading the way on agricultural solutions to climate change.

In partnership with conservation organizations, and with support from local, state, and federal agencies, producers are taking action by implementing agricultural practices that reduce greenhouse gas emissions, store carbon in soils, and build agricultural systems that are more resilient to a changing climate. This work aligns with county and state efforts to combat climate change, enhances food security, and promotes biodiversity, while simultaneously improving long-term agricultural productivity and viability in the region.

Climate change requires solutions at scale. Agricultural partnerships in this region have delivered innovations and projects demonstrating that agriculture can be an effective and scalable climate solution. This article on climate-smart agriculture appears in both Marin and Sonoma County's Crop and Livestock Reports. It reflects the ongoing collaboration between both counties and underscores the immense value of the work carried out by farmers, ranchers, and their conservation partners in the region to advance agricultural climate solutions and sustain agricultural productivity with benefits to us all.

Building strong partnerships between farmers and ranchers and the local institutions that support them are critical to creating climate resilient agricultural landscapes.
Together they are leading the advancement of agriculture as a climate solution.

What is Climate-Smart Agriculture?

A term first defined by the Food and Agriculture Organization of the United Nations, climate-smart agriculture has since been endorsed by the United States Department of Agriculture (USDA) in recognition of its important role in tackling climate change.

"Climate-smart agriculture and forestry is an integrated approach that enables farmers, ranchers, and forest landowners to respond to climate change by reducing or removing greenhouse gas emissions (mitigation) and adapting and building resilience (adaptation), while sustainably increasing agricultural productivity and incomes." - USDA

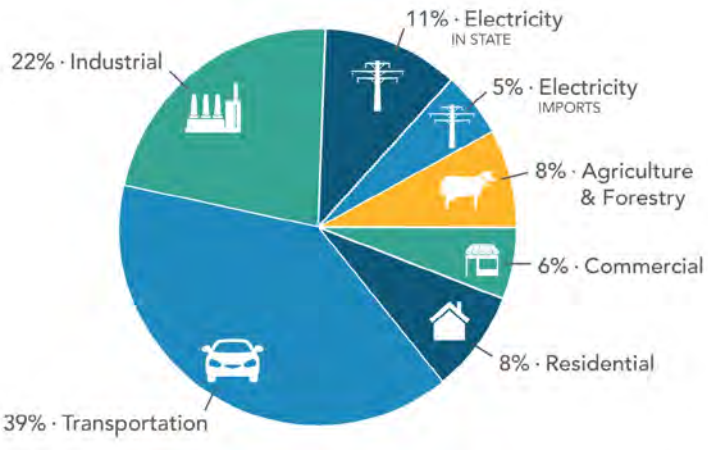
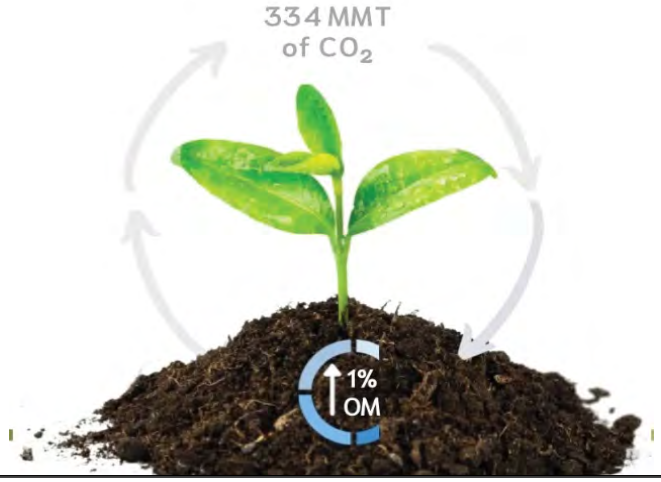
Climate-smart agricultural practices include a diverse and wide range of activities such as switching to renewable power sources to improve on-farm energy efficiency, planting cover crops to improve soil health and soil carbon storage, and manure management to reduce methane emissions.

Agricultural Climate Solutions

A 2019 Carbon Cycle Institute analysis estimating carbon sequestration opportunities on California's farms and ranches suggests that the agricultural sector has the potential to reach and exceed carbon neutrality over the next two decades (if deployment of agricultural carbon sequestration practices are initiated at scale in the near term).

"Our agricultural lands present large untapped climate solutions that also deliver economic, social and environmental co-benefits." - Carbon Cycle Institute

Recognizing the enormous potential for climate solutions on agricultural lands in Sonoma and Marin, both counties are integrating climate-smart agriculture into their climate action plans.

California's Greenhouse Gas Emissions 2021 Total: 381.3 million metric tons of carbon dioxide equivalent (MMT CO2e)	A 1% increase in the organic matter (OM) content of the state's 20M acres of arable lands would represent a transfer of 334 MMT CO2e from the atmosphere to the soil.
	
Source: California Air Resources Board	*Source: Carbon Cycle Institute*

Reaching County Climate Goals in Partnership with Agriculture

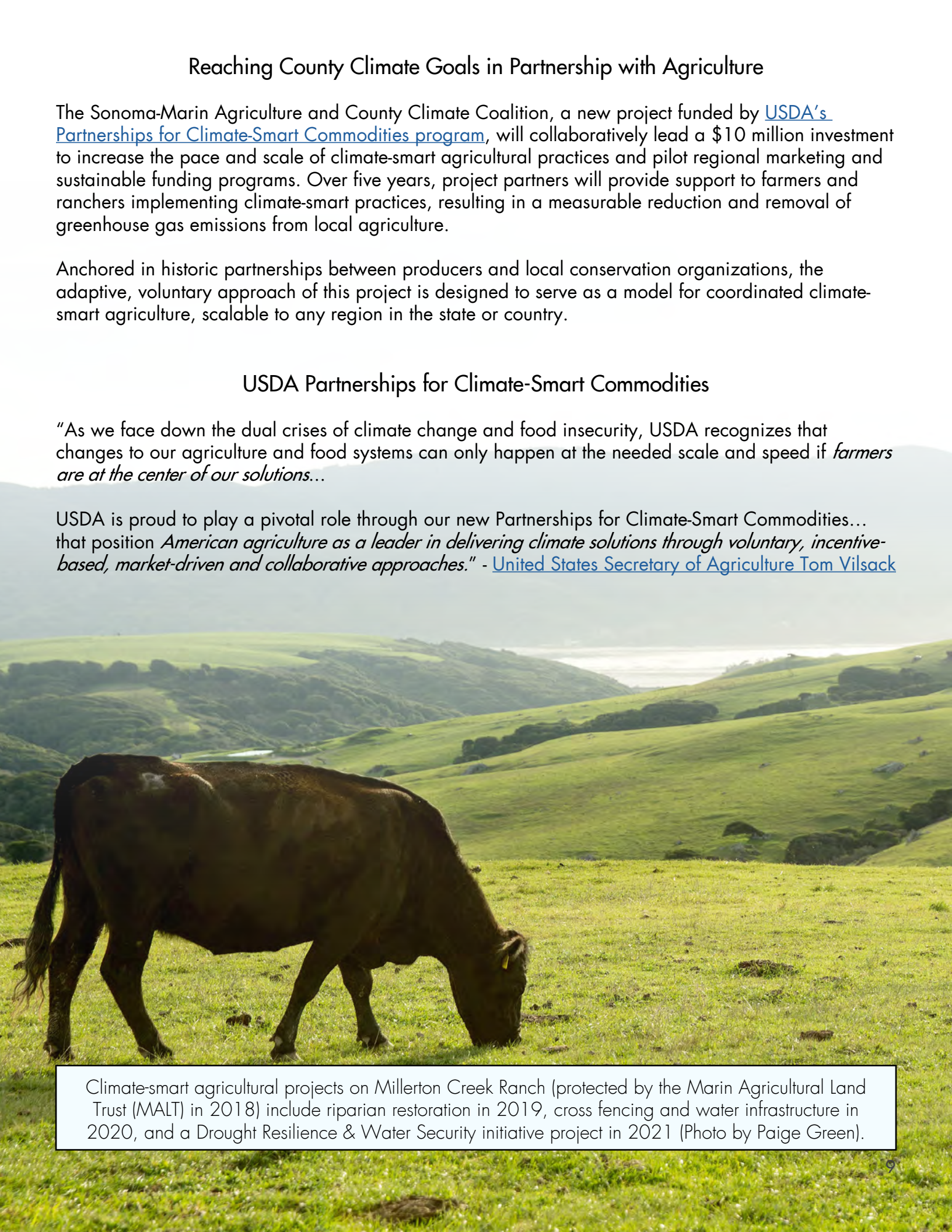
The Sonoma-Marin Agriculture and County Climate Coalition, a new project funded by USDA's Partnerships for Climate-Smart Commodities program, will collaboratively lead a $10 million investment to increase the pace and scale of climate-smart agricultural practices and pilot regional marketing and sustainable funding programs. Over five years, project partners will provide support to farmers and ranchers implementing climate-smart practices, resulting in a measurable reduction and removal of greenhouse gas emissions from local agriculture.

Anchored in historic partnerships between producers and local conservation organizations, the adaptive, voluntary approach of this project is designed to serve as a model for coordinated climate-smart agriculture, scalable to any region in the state or country.

USDA Partnerships for Climate-Smart Commodities

"As we face down the dual crises of climate change and food insecurity, USDA recognizes that changes to our agriculture and food systems can only happen at the needed scale and speed if *farmers are at the center of our solutions*...

USDA is proud to play a pivotal role through our new Partnerships for Climate-Smart Commodities... that position *American agriculture as a leader in delivering climate solutions through voluntary, incentive-based, market-driven and collaborative approaches.*" - United States Secretary of Agriculture Tom Vilsack



Climate-smart agricultural projects on Millerton Creek Ranch (protected by the Marin Agricultural Land Trust (MALT) in 2018) include riparian restoration in 2019, cross fencing and water infrastructure in 2020, and a Drought Resilience & Water Security initiative project in 2021 (Photo by Paige Green).

Pioneers of Climate-Smart Agriculture

Working together, farmers, ranchers, scientists, and local conservation organizations in Marin and Sonoma were some of the first pioneers of climate-smart agriculture in the nation. Agricultural conservation partnerships in the two counties resulted in important contributions to soil carbon science and projects demonstrating that implementing science-informed practices on agricultural lands could be effective climate solutions at scale.

Did you know...

...that in 2008, the Marin Carbon Project initiated a study site in Marin providing some of the *earliest evidence that enhanced land management could increase carbon sequestered in soils*.

Nicasio control site 16 years later – Note the dramatically shorter vegetation dominated by annual grasses (Photo by John Wick)

Nicasio compost application site 16 years later – Note the native perennial bunchgrasses (Photo by John Wick)

...that Jackson Family Wines in Sonoma County is one of the first vineyard owners and wineries who made a commitment to *cut carbon emissions in half by 2030 and be climate positive by 2050*, and that Straus Family Creamery in Marin County is committed to becoming the first carbon neutral dairy in the nation.

Spreading compost in Saralee's Vineyard long-term Soil Health Ongoing Field Trial (Photo by Sonoma RCD)

On-farm electric vehicles as part of the Carbon Neutral Dairy Farming Model – Electric Loader and Electric Feed Truck (Photo by Straus Family Creamery)

Partnerships Lead to Solutions

Scaling climate-smart agricultural practices requires investing in agricultural conservation programs and services that provide both technical and financial assistance to farmers and ranchers and ensure that proposed agricultural climate solutions are regionally appropriate, support rural economic development and have long-term, measurable benefits.

Carbon Farming

The North Coast Soil Hub, led by seven Resource Conservation Districts (RCDs) including Gold Ridge, Marin and Sonoma, is a regional partnership of agencies, organizations, and agricultural producers dedicated to improving soil health and advancing climate-smart agriculture. It is part of the wider Carbon Farming Network, composed of 45 RCDs across California, each working with local communities and partners on a voluntary basis to steward natural resources and build agricultural resilience. Playing a key role in achieving California's climate and habitat goals, RCDs are experienced in collaborating with land managers, agencies and local organizations to leverage resources to achieve greater impact.

In a joint project funded by the California Department of Food and Agriculture's (CDFA) Healthy Soils Program, the RCDs and UC Cooperative Extension (UCCE) combined their expertise to support producers in Marin and Sonoma. This project aims to promote the development of healthy soils on agricultural lands by implementing innovative conservation management practices that sequester carbon, reduce greenhouse gasses, and improve soil health.

In 2023, RCDs, in collaboration with Zero Foodprint, received funding from the Healthy Soils Program Block Grant Pilot. This grant is designed to facilitate financial assistance to agricultural operations in California, with a focus on socially disadvantaged farmers and ranchers. This funding will help expand support for producers adopting climate-friendly farming practices in our region.

What is Carbon Farming?

Carbon farming involves implementing agricultural conservation practices that are known to reduce greenhouse gas emissions and/or capture carbon dioxide from the atmosphere and store it in soils and vegetation. Carbon farming is successful when carbon gains from implementing these practices exceed carbon losses from agricultural production.

Photos by Jessica Rowland Photography: Riparian Planting Ebabias Creek March 2020 - The restored riparian zone will serve as an important wildlife corridor, perennial aquatic habitat, and migration shelter.

What is Healthy Soil?

Healthy soil is the foundation for productive and sustainable agriculture.

The USDA Natural Resources Conservation Service (NRCS) defines healthy soils as those with the continued capacity to function as a vital living ecosystem that sustains plants, animals, and humans. Characteristics of healthy soil include good soil drainage, a large population of microorganisms, sufficient levels of essential nutrients and organic matter, and low weed pressure.

Healthy soil can also be an effective way to address climate change. With an increased capacity to store carbon, healthy soil contributes to climate change mitigation. Higher levels of soil organic carbon also improve nutrient availability for plants, water infiltration and retention, and soil structure. Improved soil health increases agriculture's adaptive capacity and resilience against wildfire, drought, heat, and flood risks that are exacerbated by climate change. It also contributes to more resilient regional food systems.

Manure Management

With 19 cow dairies in Marin County and 48 in Sonoma County, there is significant potential to reduce methane emissions through alternative dairy manure management practices, and to sequester carbon through reutilization of organic materials for soil enhancements.

In another joint project funded by CDFA's Alternative Manure Management Program (AMMP), which provides financial assistance for the implementation of non-digester manure management practices in California, RCDs and UCCE in both counties scaled up their capacity to provide technical assistance to producers implementing practices that reduce methane emissions in their livestock and dairy operations.

Photos from top to bottom: Hands holding soil (by MALT); Moretti Family Dairy (by Paige Green)

Compost Amendments & Recycling Organic Waste

Organic waste can be diverted from landfill and recycled as compost for use on agricultural lands. As part of a statewide effort to reduce emissions of short-lived climate pollutants, California's SB 1383 targets a 75% reduction in organic waste (food and green waste) disposal in landfills by 2025. Applied as a soil amendment, compost can improve soil health, leading to improved productivity, climate resilience, and carbon sequestration in soils. Compost application is a practice frequently implemented in carbon farming and healthy soils programs.

Informed by insights from prior initiatives such as the Carbon Sequestration Pilot Program in Sonoma and the West Marin Co-Composting Program, RCDs, governments in both counties, and Zero Waste Marin and Sonoma are currently working together to divert organic waste from landfills and produce high quality compost locally for use on agricultural lands.

What is compost?

"…*compost* is the final product of a managed thermophilic process through which microorganisms break down organic materials into forms suitable for beneficial application to the soil. A well-managed composting process has plenty of oxygen, goes through a high-heat phase that accelerates the natural biodegradation of organic materials and produces a stable form of organic matter that is made up of carbon and nitrogen, contains other important nutrients, and is free of weed seeds and harmful pathogens." - Marin Carbon Project

Compost application support for farmers and ranchers:

The Dirt on Compost
Zero Waste Sonoma Compost Rebate Program
Zero Foodprint Compost Connector Program

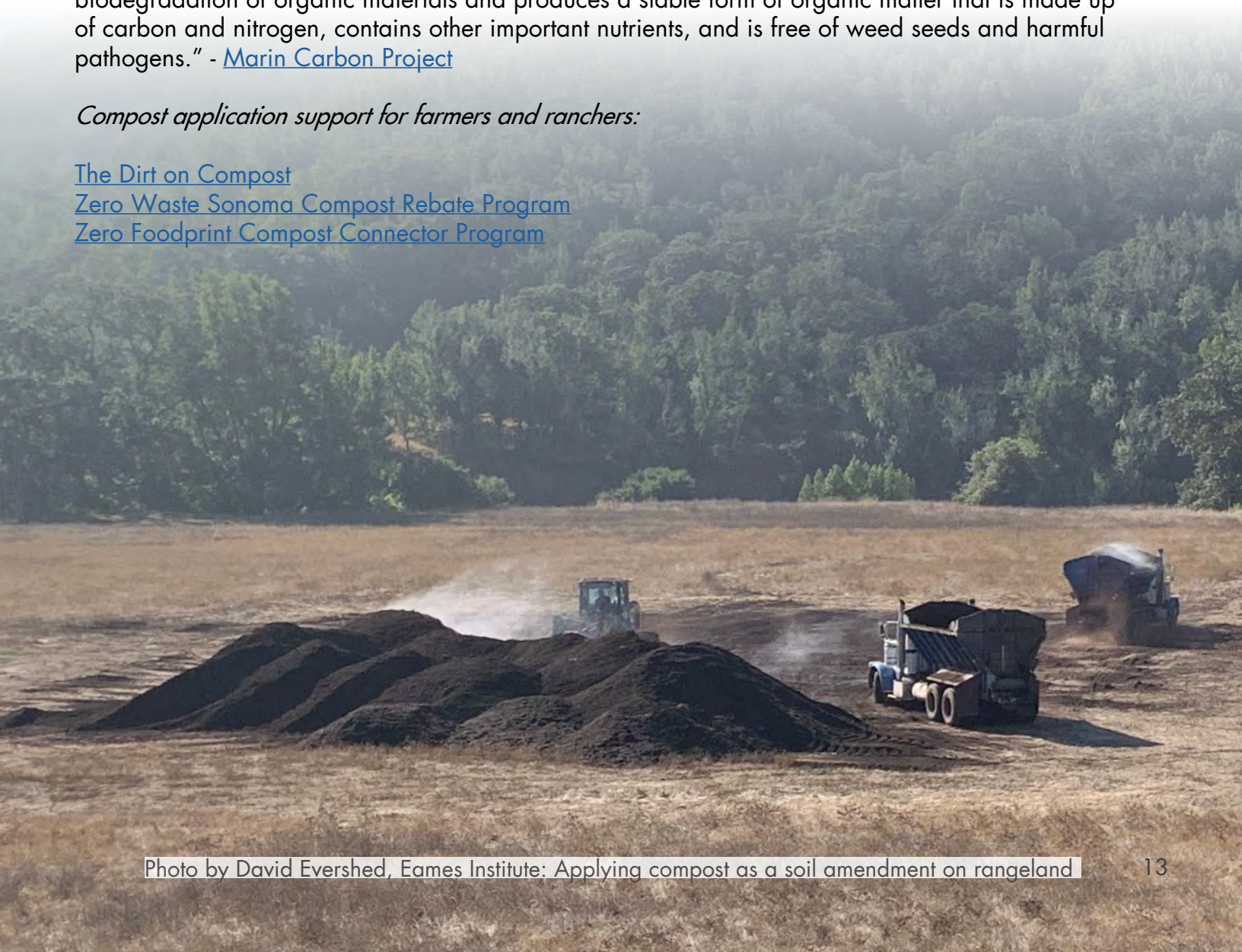


Photo by David Evershed, Eames Institute: Applying compost as a soil amendment on rangeland

Total Impact of Highlighted Climate-smart Agricultural Projects and Programs

As of December 2023

18+ Partners collaborating on climate-smart agriculture programs and projects

16 RCD trained carbon farm planners

88,408 Acres of agricultural land covered by programs and projects in Marin, Sonoma & surrounding counties

399,340 Cumulative MTCO2e in estimated climate mitigation benefits*

$25.3 million Dollars invested in the projects highlighted, including matching contributions and cost-share

378 Projects on farms & ranches completed, in progress, or in the pipeline

*Over 20 years for SMACCC project & 5 years for AMMP program

Advancing Agricultural Climate Solutions Together

Building on the successes in climate-smart agriculture by engaging with producers in strong local and regional partnerships, the agricultural community in Marin and Sonoma continues to take the lead in advancing agriculture as a key climate solution. Sustained support is needed to engage more farmers and ranchers in climate-smart agriculture to achieve climate action planning goals, adapt and build resilience to climate change, and most importantly to keep local agriculture thriving in the decades ahead.

Support Climate-Smart Agriculture

- Learn more about climate-smart agriculture.
- Buy from local agricultural producers.
- If you are a farmer or rancher interested in climate-smart agriculture, reach out to your local RCD or UCCE office.
- Support AB 408, the Food and Farm Resilience Bond co-sponsored by the Food and Farm Resilience Coalition.

Contributions to this article were provided by Marin County Department of Agriculture/Weights & Measures, Sonoma County Department of Agriculture/Weights & Measures, County of Sonoma Climate Action & Resiliency Division, County of Marin Community Development Association, Gold Ridge, Marin, and Sonoma Resource Conservation Districts, University of California Cooperative Extension Marin & Sonoma, Agricultural Institute of Marin, Marin Agricultural Land Trust, Carbon Cycle Institute, North Coast Soil Hub, and Zero Waste Marin, with support from the Marin Carbon Project Coordinator.

Photos by Jeff Lewis: Gallagher North Bend Ranch

Sustainable Agriculture Activities

INTEGRATED PEST MANAGEMENT

Integrated pest management (IPM) is a common-sense approach to pest management that uses a variety of methods and tools to control pests. IPM programs focus on preventing pest problems through cultural and biological measures, although pesticides may be part of an IPM program. The goal is to eliminate or reduce pesticide applications wherever possible and take reasonable measures to ensure that the long-term prevention or suppression of pests has minimal negative impact on human health, non-target organisms, and the environment.

The Department encourages IPM strategies for long-term pest control such as the use of cultural, biological, and mechanical control methods (with chemical control as a last option).

PEST PREVENTION, DETECTION & EXCLUSION

Pest prevention encompasses several activities aimed at preventing the introduction and spread of exotic pests in Marin County.

Pest detection is the systematic search for exotic pests outside of a known infested area. The goal is to find infestations of harmful exotic pests as early as possible and eradicate them before eradication becomes biologically or economically infeasible.

Pest exclusion focuses on preventing the entry and establishment of exotic pests and limiting the intrastate movement of newly discovered pests. Marin County inspectors monitor all primary pathways of pest entry into the county including nurseries and points of entry such as UPS and FedEx package terminals.

Do these activities really work? Yes! According to the California Department of Food and Agriculture, studies show a direct correlation between agricultural inspections and lowering invasive species infestations. For every dollar spent on pest prevention, detection, and exclusion, an estimated $14 are saved in later control costs and economic losses. Preventing the introduction and spread of exotic pests in Marin County also significantly reduces the potential use of pesticides if one or more of these pests were to become established and needed to be managed.

PROTECTION OF THE ENVIRONMENT

The Department oversees the use of pesticides in Marin County and operates a Pesticide Use Enforcement program that includes a permitting process for restricted pesticides as well as education and assistance for pesticide users. While reviewing, collecting and analyzing data and records associated with pesticide sales and use, our Department also monitors pesticide use applications, investigates pesticide-related citizen complaints, and conducts pesticide-related illness investigations. The ultimate goal of this program is to ensure the safe and effective use of pest control methods in order to protect public health and the environment, while strongly promoting the production of healthy, safe food and fiber through sustainable practices.

LIVESTOCK PROTECTION PROGRAM

The Marin County Board of Supervisors continues to support and allocate cost-share funds for the Livestock Protection Program to eligible agricultural producers who qualify for non-lethal depredation improvements and practices. Recognized non-lethal control methods include the use of protection animals (e.g., livestock guardian dogs, llamas, etc.), electric fencing, and scare devices, which are eligible for cost-share funds to support ranchers. The Department administers annual verification inspections for cost-share funding for ranchers participating in this program.

Over the past year, 15 ranchers participated in the Livestock Protection cost-share program to help build and repair fences, purchase and support protection animals, and use scare devices to protect animals from predators. Protected animals include sheep, poultry, goats, cattle, and alpacas. The total funds expended to support our ranching community from July 2022 to June 2023 was $25,676.

Pest Prevention Programs

PEST EXCLUSION

In 2023, inspectors conducted 13,746 incoming plant quarantine inspections. Plant shipments were monitored at FedEx, UPS, retail nurseries, aquatic supply stores, and post-entry quarantine sites. Seventy-one rejections of plant material were made to protect Marin's agriculture and environment. Of these 71 rejections, 13 were intercepted and rejected for containing potentially invasive live pests within the parcel. Additionally, the Department performed five Spongy moth (*Lymantria dispar*) inspections of household goods from infested states.

DETRIMENTAL INSECTS INTERCEPTED IN 2023

COMMON NAME	SCIENTIFIC NAME
black thread scale	*Ischnaspis longirostris*
boxwood scale	*Pinnaspis buxi*
brown soft scale	*Coccus hesperidum*
Chaff scale	*Parlatoria pergandii*
citrus mealybug	*Planococcus citri*
Florida red scale	*Chrysomphalus aonidum*
lesser snow scale	*Pinnaspis strachani*

*The pests above are detrimental to agriculture and are prohibited from entering California.

PEST DETECTION

In 2023, Inspectors from the Marin County Department of Agriculture and the California Department of Food and Agriculture placed and serviced 1,908 traps for exotic insect pests. In total, 17,951 trap inspections were conducted, with most traps being checked every two weeks from May to October. Targeted pests include Mediterranean fruit fly (*Ceratitis capitata*), Oriental fruit fly (*Bactrocera dorsalis*), Melon fruit fly (*Bactrocera cucurbitae*), Spongy moth (*Lymantria dispar*), Japanese beetle (*Popillia japonica*), Glassy-Winged sharpshooter (*Homalodisca vitripennis*), Asian Citrus Psyllid (*Diaphorina citri*), and European grapevine moth (*Lobesia botrana*). Traps are strategically placed within the county on or near preferred hosts. For example, European grapevine moth traps are placed in vineyards, and Mediterranean fruit fly traps are placed in fruit trees.

GLASSY-WINGED SHARPSHOOTER

The Glassy-Winged Sharpshooter (GWSS), *Homalodisca vitripennis*, is a very serious threat to California agriculture. First observed in the state around 1990, it's now found in the entire counties of Los Angeles, Orange, Riverside, San Bernardino, San Diego, Ventura, and portions of Fresno, Imperial, Kern, Santa Barbara, and Tulare counties. GWSS is a particular threat to vineyards due to its ability to spread *Xylella fastidiosa*, the bacterium that causes Pierce's disease in grapevines. Pierce's disease is lethal to grapevines and significant resources are committed annually to find effective treatments and produce Pierce's Disease-resistant grape varieties. GWSS also spreads other diseases to a variety of agricultural and ornamental plants, having the potential to substantially impact California's agriculture and environment if left unchecked.

To prevent the introduction of this leafhopper into Marin County, department staff inspect incoming nursery plant shipments containing GWSS host plants from infested California counties. In 2023, a total of 878 shipments were inspected for GWSS, with no viable egg masses or live finds. Detection traps are strategically placed throughout the county to monitor for this unwanted pest.

Photo by Department staff: Inspector Eric Richardson checking a trap at a retail nursery for Glassy-Winged Sharpshooter.

SUDDEN OAK DEATH

Marin County continues to be infested with Sudden Oak Death (SOD) and Ramorum blight, the diseases caused by the plant pathogen *Phytophthora ramorum*. SOD has resulted in widespread dieback of various forest tree species, and Ramorum blight affects the leaves and twigs of susceptible forest and nursery plants. While the California bay laurel tree has been shown to be the primary predictor of *P. ramorum* in forests, mortality in tanoak and manzanita has been recorded in sections of the Mt. Tamalpais watershed, with a noticeable absence of California bay laurel, inferring that tanoak and possibly manzanita have caused the inoculum to spread.

Tree mortality in wildland and urban/wildland interface areas causes dramatic changes in the landscape, affecting ecosystems, increasing fire and safety hazards, and decreasing property values. Hosts of *P. ramorum* include various native woodland trees and understory plants, as well as assorted ornamental nursery plants. State and federal quarantines regulate the movement of host nursery stock, and ongoing research is being conducted to help production nurseries continue to mitigate the risk of spread.

On certain oaks such as Coast Live Oak, *P. ramorum* causes potentially lethal trunk cankers; on other hosts it causes leaf or twig blight, which is rarely lethal. Tanoaks may have both trunk cankers and leaf dieback. Unlike oaks, some hosts (e.g., California bay laurel) are not killed by this pathogen; instead these hosts act as a vector, allowing inoculum to spread through natural or artificial means (i.e., rainwater, soil, infested nursery stock) under moist conditions. Oaks have been found to be terminal hosts, becoming infected by pathogen spores produced on leaves of nearby plants.

Prevention is the only treatment to protect trees from *P. ramorum*. Best preventative practices include keeping trees healthy to maintain their natural defenses, pruning overstory California bay laurels, and strategically utilizing phosphonate treatment products. For more information about diagnosis, distribution, and best management practices, please visit: *http://www.suddenoakdeath.org*.

BIOLOGICAL CONTROL

Biological pest control is the use of pests' natural enemies to help suppress pest populations to economically and environmentally acceptable levels. Once the control agent becomes established, management is generally self-perpetuating, potentially eliminating or reducing the need to use pesticides. The following are pests found in Marin and some of the methods that have been used to control them:

PEST	BIOLOGICAL AGENT
Gorse	Gorse Mite, Seed Weevil
Bull Thistle	Bull Thistle Gall Fly
Yellow Star Thistle	Peacock Fly
Scotch Broom	Stem Boring Moth
Ash White Fly	Parasitic Wasp
Italian Thistle	Seed Weevil

Invasive Weed Management

JAPANESE KNOTWEED ERADICATION EFFORTS

Japanese knotweed (*Fallopia japonica*) continues to threaten parts of Marin County. First documented in the winter of 2011 along Lagunitas Creek, Japanese knotweed now occurs on state, federal, and private lands in and along both Lagunitas and San Geronimo Creeks. In 2018, the Marin Knotweed Action Team (MKAT) was created. This coalition of various land managers includes the Marin Resource Conservation District, Marin County Parks, Marin Municipal Water District, State Parks, National Park Service (Point Reyes National Seashore and Golden Gate National Recreation Area), One Tam, UC Cooperative Extension Marin, and the Marin County Department of Agriculture. MKAT is leading the effort on eradicating Japanese knotweed from these watersheds.

This invasive plant is classified as an A-rated pest by the California Department of Food and Agriculture, which is the highest and most serious pest rating. Japanese knotweed is considered one of the top 10 most aggressive, destructive and invasive plants in the world!

Small patches of knotweed can quickly grow to infest large areas of land in and along waterways, over time making creek banks more vulnerable to erosion, clogging waterways, and reducing habitat quality for fish and wildlife. It's an agressive colonizer that outcompetes native vegetation by emerging early, growing fast, and preventing seedling regeneration. It can grow through cracks in street pavement, concrete, and other hardscapes, including home foundations and septic systems. As a result, land managers are not only concerned about the ecological threat this species poses, but also about the damage it can do to homes and property.

Much great work has been done on state, federal, and private lands to manage and treat these knotweed populations. However, in order to eradicate this species in Marin, continued coordinated action must be taken before the infestation becomes more widespread.

MKAT has worked closely with dozens of streamside private property owners along San Geronimo Creek since fall 2018. The goal has been to educate them on the serious threat Japanese knotweed poses, get permission to survey their property, and treat any infestation that is found with the consent of the owner. Mechanical removal of this weed has proven to be ineffective. Attempting to manually remove plants stimulates their growth, which causes spread. Rhizomes (underground stems) have been documented to extend 23 feet horizontally and 10 feet deep.

Japanese knotweed sites range in size from newly deposited, single stem plants to mature stands of Japanese knotweed larger than half a tennis court. Over half of the sites surveyed in Marin in 2018 were less than the size of a car parking space. Based on the experiences of other land managers in northern California and Washington state, three to five years of treatment may be needed for larger sites with less and less herbicide being used in each subsequent year as the populations are reduced in size and number.

In 2023, there were 95 Japanese knotweed sites on private lands, including three newly discovered sites. Of the previously existing 92 sites, 91 sites have been treated at least once in previous years (2018-2022); one site has never been treated due to lack of permission.

Of these 91 sites surveyed in 2023, 58 had no detectable above ground stems, while 33 sites had stems present (though the height and number of stems were significantly reduced). In addition to these 33 sites and the one site that has never been treated, three new sites (ranging from one to three stems) were found in 2023 during a streambank survey of San Geronimo Creek from Creamery Road in San Geronimo to the Inkwells in Lagunitas. Of the total 95 sites, 64 sites were not treated due to either no visible stems present at the time of treatment (58 sites), or lack of property owner permission (4 sites), or manual removal (two sites). The remaining 31 sites were treated in August 2023. The total treatment area for 31 sites was 0.26 foliar acres. Herbicide use for all 31 sites in August 2023 included: three ounces of Polaris, 5.9 ounces of Competitor (adjuvant), and nine ounces of Roundup Custom.

MKAT is continuing to educate and work with four property owners that have declined treatment to manage Japanese knotweed on properties with streamside knotweed. To date, there are also two additional properties with Japanese knotweed near the residence (not near the stream) that also have declined treatment. More information about Japanese knotweed can be found at *https://ucanr.edu/sites/MarinKnotweedActionTeam*.

MARIN/SONOMA WEED MANAGEMENT AREA

The Marin/Sonoma Weed Management Area (MSWMA) is a cooperative organization fighting weeds and invasive plants in Marin and Sonoma Counties. Established in 1999, the group includes representatives from federal, state, county and city agencies, private industry, and landowners.

MSWMA reconvened Fiscal Year 2019-20 as a result of the California legislature approving $2 million in state-wide funding in Spring 2019 for weed projects across California. MSWMA had not officially met since 2015 due to the lack of state funding to support weed projects. Going forward the California Department of Food and Agriculture has a baseline amount of $3 million for noxious weed control and research through California's Biodiversity Initiative.

MSWMA's goals include improving the effectiveness of local weed management efforts, increasing public awareness of invasive weeds, advancing responsible land stewardship practices, and working collaboratively with partner organizations by sharing resources and knowledge to manage and/or eradicate invasive weed populations. MSWMA helps control weeds across land ownership boundaries by uniting landowners with public agencies and providing an opportunity to share resources in mapping, planning, and treatment strategies.

Visit the Marin/Sonoma Weed Management Area website at *https://www.cal-ipc.org/solutions/wmas/marin-sonoma-wma/*. Information can also be found at *https://www.marincounty.org/depts/ag/weeds*.

Photos by Department staff (left to right): Japanese knotweed site June 2020 prior to treatment; same site July 2021 after treatment.

Marin Organic Farming & Ranching

MARIN ORGANIC CERTIFIED AGRICULTURE

The Marin County Department of Agriculture is accredited by the United States Department of Agriculture (USDA) as an official organic certification agency. For more than 20 years, Marin Organic Certified Agriculture (MOCA) has served local agricultural producers who employ organic farming and ranching practices and seek formal certification under USDA's National Organic Program (NOP). Organic production systems strive to achieve agro-ecosystems that are socially, economically, and environmentally sustainable. Organic farming emphasizes greater cooperation with nature without reliance on synthetic inputs.

Consumer demand for certified organic products continues to increase, with an expectation by consumers that organic products are verifiable. MOCA was established in 2001 to provide a professional service to local individual and business operations engaged in the production and distribution of organically produced commodities.

The primary responsibilities of MOCA are to uphold the standards of the NOP and document and verify operations' practices of sustainable agriculture. One of the most important benefits of the MOCA program is as a local resource that services the production of organic, value-added products by Marin's family farms.

In 2023, MOCA certified 46 operations as organic including 13 dairies, 5 beef and 2 poultry operations, 13 fruit and vegetable operations, and 3 creameries. Twenty-eight of the operations are located in Marin County. Sixteen operations are located in Sonoma County. The remaining two operations are located in Riverside County and are managed by Marin-based operations to ensure a year-round supply of fresh produce in the local off-season.

You can learn more about organic farming and ranching by visiting the USDA's NOP website at *https://www.ams.usda.gov/about-ams/programs-offices/national-organic-program*.

CALIFORNIA ORGANIC PROGRAM

All organic producers in California must register with the California Department of Food and Agriculture's Organic Program. In 2023, there were 78 registered organic producers in Marin County, farming approximately 48,900 acres and producing an estimated gross value of $42,000,000. More than 97% of Marin's organically farmed acreage is pastureland (approximately 48,300 acres).

Beginning January 2017, changes to the Organic Food and Farming Act no longer require organic registrants in California to provide detailed commodity information and acreage to the state. Before these changes, the state and its counties had been collecting detailed informaiton on specific commodities, their acreage and associated value. This allowed counties to evaluate the contribution of organic agriculture to the overall county economy and to ascertain the ratio of organic to conventional acreage. The total production acreage is now reported by registrant rather than commodity. For more information on organic farming, visit *http://www.cdfa.ca.gov/is/organicprogram/*.

Marin Certified Farmers' Markets

Certified Farmers' Markets are community events bringing together farmers and consumers. They offer the opportunity to meet certified producers and learn how and where their food is grown. At these markets, farmers may only sell what they grow so consumers can rest assured the food is fresh, seasonal, and direct from the farm.

Marin's Certified Farmers' Markets showcase the diversity and abundance of local and regional produce. In 2023, 13 Certified Producer Certificates were issued to producers in Marin County, which allows growers to sell at the markets, and 11 farmers' markets were certified. Check our website at *http://www.marincounty.org/depts/ag* to stay up to date with current market schedules.

CURRENT MARIN COUNTY CERTIFIED FARMERS' MARKETS

CORTE MADERA
Corte Madera Town Center
Wednesday 12:00 pm - 5:00 pm
Open all year

FAIRFAX
Bolinas Park
Wednesday 4:00 pm - 8:00 pm
May - October

LARKSPUR
Marin Country Mart
Saturday 9:00 am - 2:00 pm
Open all year

NOVATO
Hamilton Landing
Tuesday 10:00 am - 2:00 pm
June - November

MARIN COUNTY CIVIC CENTER
Thursday 8:00 am -1:00 pm
Sunday 8:00 am -1:00 pm
Open all year

MILL VALLEY
E. Blithedale Ave. @ Alto Shopping Center
Friday 9:30 am - 2:30 pm
Open all year

MILL VALLEY
Strawberry Village Shopping Center
Tuesday 10:00 am - 2:30 pm
June - November

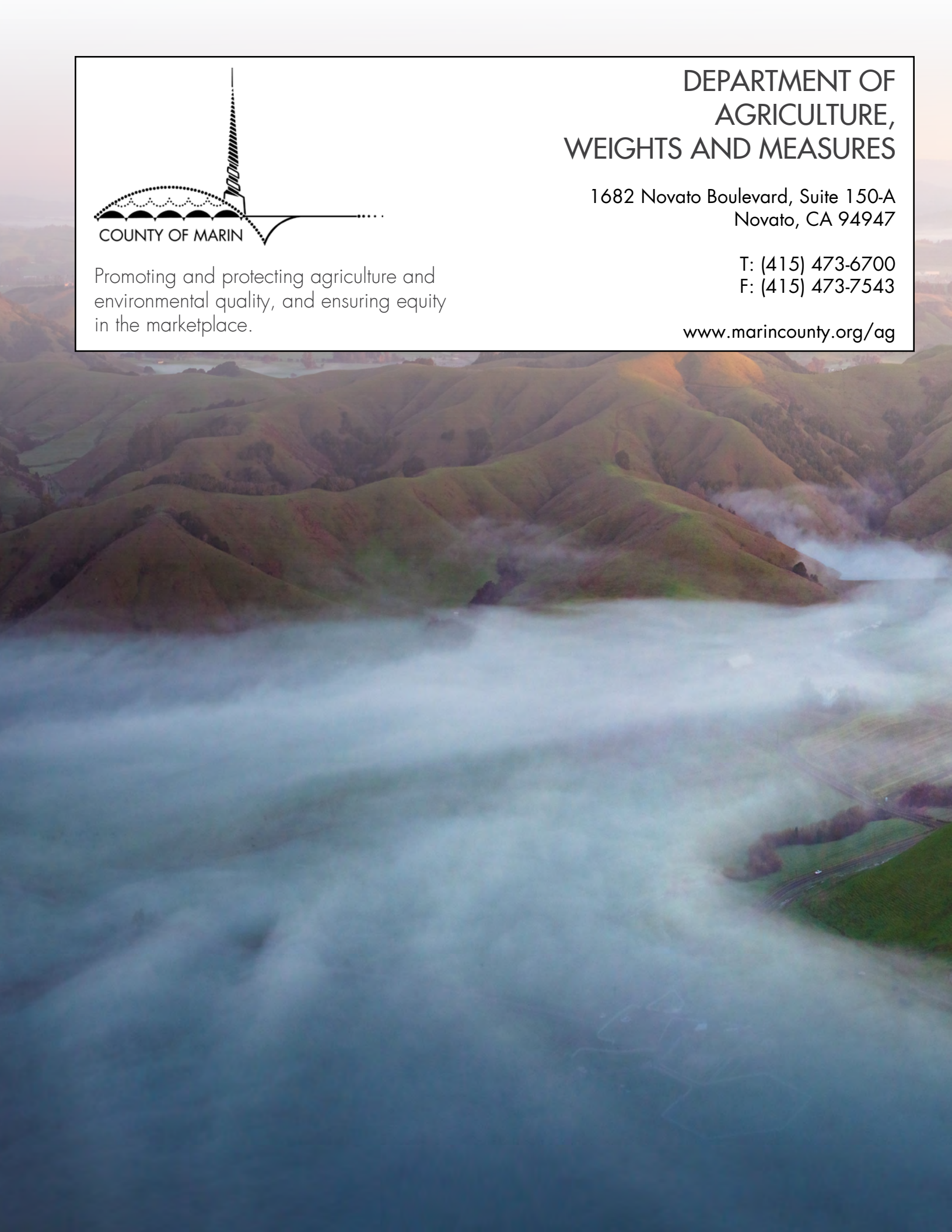
NOVATO
Sherman Ave.
Tuesday 4:00 pm - 8:00 pm
May - October

POINT REYES STATION
Toby's Feed Barn
Saturday 9:00 am - 2:00 pm
June - November

SAN RAFAEL
Fourth St., between A and Lootens
Thursday 5:30 pm - 8:30 pm
June - August

SAUSALITO
Dunphy Park
Sunday 8:00 am - 2:00 pm
Open all year

Photos by Department staff (from left to right): MOCA sign at a farmers' market; fresh vegetables for sale at a farmers' market.



COUNTY OF MARIN

Promoting and protecting agriculture and environmental quality, and ensuring equity in the marketplace.

DEPARTMENT OF AGRICULTURE, WEIGHTS AND MEASURES

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