# GROWN IN CALIFORNIA

## *Buy California Marketing Agreement* *$2,772,600*

### Explore CA GROWN Goodness

The California Department of Food and Agriculture will partner with the Buy California Marketing Agreement (BCMA) for a project that supports California's specialty crop farmers by implementing a multi-platform digital campaign and designed to generate strong support from the retail and food service trade in marketing California Grown specialty crops and increasing consumer demand for California specialty crops and specialty crop products. This project will benefit 75 farmers and stakeholders and is expected to increase sales by 10 percent or $40 million. This project will establish the Explore CA GROWN Goodness campaign by designing and implementing educational programs and marketing promotions to increase awareness and consumption of California Grown specialty commodities, helping consumers develop a better relationship with California Grown agricultural products and enjoy the best of the California lifestyle. Promotions are also designed to increase the value of California agricultural products while helping to build strong communities and a thriving California economy. The multiplatform digital campaign will utilize contextually relevant media placements, deliver rich and engaging experiences within impactful media, integrate multiple influencer marketing programs, and utilize social media to reach consumers in shareable environments. Retail trade outreach will be conducted, and promotional partnerships will be established with key California retailers to execute retail promotion programs both in-store and through digital extension. Performance will primarily be measured through sales increase and digital media analytics. Success will be measured through total sales performance and/or category lift for featured specialty crops during the promotional period. Success will be measured through increased sales and improved digital analytics including consumer connection with California Grown digital content via reach, time on site, video completion and click rates.

## *California Cantaloupe Advisory Board* *$500,000*

### Increasing Demand for California Cantaloupe Among Younger Consumers

The California Department of Food and Agriculture will partner with the California Cantaloupe Advisory Board for a project that supports California's specialty crop farmers by increasing demand for California cantaloupe among younger consumers. This project will benefit 100 farmers and stakeholders and is expected to increase cantaloupe production by half a million cartons and increase shipping point prices by $1 per carton. Utilizing short-form video content promoted on social media channels and at retail, the project will leverage National Football League Quarterback Josh Allen's popularity and large social media following to reach younger consumers, shifting their perception of cantaloupe and boosting its popularity among Gen Z and Millennial

consumers. Success will be evaluated by measuring sales volume and grower prices, and by tracking audience reach.

## *The California Department of Food and Agriculture* *$400,000*

### Market Development, Education, and Trade Facilitation for California Specialty Crops

The California Department of Food and Agriculture will support California's specialty crop farmers through international market development activities and outreach. This project will benefit 450 farmers and stakeholders and is expected to increase consumption and consumer purchasing of specialty crops by increasing sales by $89,901,087 and 10 percent change. The U.S. Department of Agriculture (USDA) currently calculates that for every $1.00 of U.S. agricultural exports, an additional $1.09 in economic activity is generated. Further, every $1 billion in agricultural exports supports an estimated 6,338 jobs. This project will accomplish goals through outreach and technical assistance sessions, including market education webinars, by integrating and aligning the workforce needs of specialty crop growers and local and regional food systems with the educational pathways provided by California's Community Colleges. Evaluation of this project will occur through surveys of participating companies to record sales and projected sales as well as related metrics "new to export," "new to market," and "sales to new market."

## *California Distillers Association* *$470,000*

### Promoting California Specialty Crop Consumption and Sales

The California Department of Food and Agriculture will partner with the California Distillers Association (CDA) for a project that supports California's specialty crop farmers by encouraging distillers to utilize undervalued crops and increase consumer awareness via digital tools and advertising. This project will benefit 93 farmers and stakeholders and is expected to increase sales by 20 percent. Opportunity abounds in the fast-growing spirits sector, which surpassed beer as America's highest selling alcohol in 2022. By shifting undervalued crops such as grapes, berries, nuts, and dates to this higher-value channel, benefits extend across the California specialty crop industry. The California Distillers Association seeks to grow specialty crop sales through an innovative, web-based trail map of craft distilleries featuring specialty crops producers, amplified with digital media and influencer marketing. The project goals are to build consumer awareness and consumption, spurring a 20 percent boost in California grown and distilled specialty crop-based spirit sales, measured by distillery reports.

## *California Sustainable Winegrowing Alliance* *$499,951*

### Sharing the Value of Sustainable California Wine to Build Millennial and Gen Z Consumer Demand

The California Department of Food and Agriculture will partner with California Sustainable Winegrowing Alliance (CSWA) for a project that supports California's specialty crop farmers by connecting millennials and Gen Z consumers to California wines in efforts to demonstrate the stewardship efforts within winegrape production. This project will benefit 5,639 farmers and stakeholders and is expected to increase consumption and consumer purchasing of specialty crops by increasing sales by 5 percent by 2028. This project will launch a new campaign that will increase sales through, 1) creation and promotion of marketing materials, 2) events, and 3) by providing tools and education. The increase in sales will be measured through independent sales data.

## *Santa Lucia Highlands Wine Artisans* *$495,950*

### Driving Sales and Awareness Among New Drive-Market Consumers

The California Department of Food and Agriculture will partner with Santa Lucia Highlands Wine Artisans (SLHWA) for a project that supports California's specialty crop farmers by boosting the awareness and sales of Monterey County and Santa Lucia Highlands wines. This project will increase direct-to-consumer wine sales by 5 percent. Success will be measured by tracking direct-to-consumer sales, visitation, and sign-ups; grape pricing change; and additional digital and social media campaign metrics. Through consumer events, digital media campaigns, and trade advertising, the project will drive visits to the region; highlight sustainable farming and the innovation, history, and generational stories of Monterey's growers and winemakers; and increase grape sales.

## *State Center Community College* *$485,462*

### Grow Global: California Specialty Crop Exporter Development Program

The California Department of Food and Agriculture will partner with State Center Community College for a project that supports California's specialty crop farmers by addressing the critical need to enhance California specialty crop producers' ability to compete in international markets. The project will benefit 360 farmers and stakeholders and is expected to increase sales by $3 million and 50 percent overall. The project will train 135 new exporters through an eight-class export training series and provide 225 producers with direct connections to qualified international buyers during three inbound trade missions. Success will be measured by establishing baseline sales, tracking new sales through post-mission surveys, and calculating percentage growth. This initiative will create a self-sustaining export training program and strengthen California's specialty

crop industry by expanding market opportunities and fostering long-term economic growth.

## *Sunsweet Growers, Inc.* *$500,000*

### Revitalizing California Prune Sales by Engaging Health-Focused Younger Consumers

The California Department of Food and Agriculture will partner with Sunsweet Growers, Inc. (SSG) for a project that supports California's specialty crop farmers by building awareness and increasing demand for California prunes among Millennials and Gen Z consumers. This project will benefit 179 farmers and stakeholders and is expected to increase sales by $4 million. The project team seeks to drive a 3 percent increase in new high value sales to increase revenues for California prune producers, who grow 99 percent of all domestic prunes and 40 percent of global supply. Strategies include a national public relations campaign, sampling and outreach, and digital and social media placements, sharing the value of California-grown prunes in a healthy lifestyle to resonate with the target market. Success will be measured through internal sales records and national grocery sales data.

## *West Sonoma Coast Vintners* *$400,702*

### Maritime Magic: Expanding California Specialty Crops

The California Department of Food and Agriculture will partner with West Sonoma Coast Vintners (WSCV) for a project that supports California's specialty crop farmers by helping promote the unique and appealing qualities of the wines at the West Sonoma Coast region. This project will benefit 47 farmers and stakeholders and is expected to increase consumption and consumer purchases of specialty crops by 15 percent. Comprised of 30 members, most dual winegrape growers and vintners, WSCV will launch a marketing campaign to trade, media, and consumers in Texas, the fourth largest importer of wine in the United States. This project will support, 1) developing marketing assets, 2) expanding Farm Camp, 3) targeted Texas marketing and events, and 4) in-region events. The project outcome will be measured by crop reports.

# HEALTHY SPECIALTY CROPS FOR ALL CALIFORNIANS

*Circle of Life (on behalf of Foodshed Cooperative)* *$250,000*

**Farmers' Food as Medicine**

The California Department of Food and Agriculture will partner with Circle of Life, on behalf of Foodshed Cooperative, for a project that supports California's specialty crop farmers by ensuring small-scale farmers and producers can access an emerging market channel. This project will benefit 50,255 farmers and stakeholders and is expected to increase knowledge gained about more efficient and effective distribution system among 105 stakeholders. Foodshed Small Farm Cooperative and San Diego Wellness Collaborative will design, implement, and evaluate a Farmers' Food as Medicine outreach and education campaign to increase the share of locally grown specialty crops sourced to fulfill Produce Rx. Through a combination of strategies including video, print, partnership meetings, and in-person training, the Farmers' Food as Medicine campaign will inform at least 50,000 consumers and increase market channel participation among 100 specialty crop producers.

*Color the Block* *$250,000*

**Roots to Harvest: School Garden Agricultural Education Program**

The California Department of Food and Agriculture will partner with Color the Block for a project that supports California's specialty crop farmers by increasing agricultural knowledge among students and community members in South Sacramento and enhancing awareness of agricultural careers. This project will benefit 1,500 farmers and stakeholders and is expected to increase knowledge gained about specialty crops among 1,500 adults and children. The Roots to Harvest project aims to enhance agricultural education in South Sacramento communities by establishing school gardens where students will learn how to grow, maintain, and harvest specialty crops. Through hands-on workshops, students will gain business and leadership skills related to agricultural entrepreneurship, best management practices, and healthy food consumption. Expected outcomes include increasing career awareness through exposure to agricultural and business opportunities and fostering stronger community engagement through 60 hands-on workshops and 60 community events, each with an estimated attendance of 25 participants. Project success will be measured through a combination of pre-and post-surveys and attendance.

## *County of San Joaquin* *$375,804*

### San Joaquin County AgVenture

The California Department of Food and Agriculture will partner with the County of San Joaquin for a project that supports California's specialty crop farmers by bringing together farmers, ranchers, industry partners, and local school districts to educate third-grade students about the importance of San Joaquin County's agricultural industry and the benefits of incorporating specialty crops into a healthy diet. This project will benefit 94,070 farmers and stakeholders and is expected to increase the number of consumers who gained knowledge about specialty crops by 932. San Joaquin County AgVenture (AgVenture) will consist of three educational components, including, 1) specialty crop commodity videos produced and filmed at local specialty crop farms, which will be viewed in third-grade classrooms prior to in-person field days and made available free to the public through an online video library; 2) in-person field days featuring learning stations, displays, hands-on experiences, and a specialty crop farmers' market; and 3) live, interactive, virtual farm trips that allow students to visit local specialty crop farms from their classroom. As a result of these activities, AgVenture anticipates that 89,570 students and their chaperones will gain knowledge about specialty crops and their health benefits.

## *Food Exploration and Discovery (dba Food ED)* *$194,188*

### Entrepreneurs: Specialty Crop and Health Literacy Program

The California Department of Food and Agriculture will partner with Food Exploration and Discovery (dba Food ED) for a project that supports California’s specialty crop farmers by increasing demand for fruits and vegetables among high school students and community members in San Gabriel Valley through health literacy. This project will benefit 3,000 farmers and stakeholders and is expected to increase knowledge gained about producing, preparing, procuring, and/or accessing specialty crops by 1,700 stakeholders. This program will train high school leadership teams to lead gardening and food workshops about specialty crops, teach community members about their benefits and uses, and educate surrounding cities about specialty crops through farmers’ markets and city education events. Project metrics and success will be measured through qualitative and quantitative surveys given out to all classes and community members at workshops.

## *Mother Natives* *$176,350*

### Deadzone Destroyers: Native Plant Education and Resources for a Healthier Specialty Crop Ecosystem

The California Department of Food and Agriculture will partner with Mother Natives for a project that supports California’s specialty crop farmers and stakeholders by increasing demand for and understanding of native plants, an underutilized specialty crop. This

project will benefit 1,450 farmers and stakeholders and is expected to increase specialty crop knowledge for 5,000 consumers. This project is designed to address the critical need for increased awareness and integration of native plants within the Sacramento region. The project will educate the community through a series of targeted workshops and outreach efforts that emphasize the ecological and economic benefits of native plants. Project success will be evaluated through a comprehensive and multi-faceted data collection and feedback system designed to capture the impact of each activity.

## *Pacific Coast Farmers' Market Association* *$494,163*

### Nutrition Education for Healthy Communities and Sustainable Farmers Markets

The California Department of Food and Agriculture will partner with Pacific Coast Farmers' Market Association (PCFMA) for a project that supports California's specialty crop farmers by creating nutrition education sessions that will provide consumers with information on incorporating specialty crops into their family's diets. This project will benefit 3,460 farmers and stakeholders and is expected to increase consumption and consumer purchases of specialty crops by 2,850 consumers who will gain knowledge and 1,350 who increase consumption of specialty crops. Nutrition education will be conducted through live, in-person cooking demonstrations in over 20 Bay Area communities served by certified farmers' markets. Participants will receive seasonal recipes and information on local farmers' markets to encourage purchases of locally grown specialty crops. Nutrition information will be distributed via social media and at community-based health, wellness, and resource fairs. Surveys at the end of nutrition education sessions and follow-up electronic surveys via email will assess the change in farmers' market shopping and specialty crop purchases by project participants.

## *The Regents of the University of California, Davis* *$329,089*

### Fermented California-Grown Specialty Crops to Expand Consumption Through Health Promotion and Spoilage Prevention

The California Department of Food and Agriculture will partner with the University of California (UC), Davis for a project that supports California's specialty crop farmers by developing new recipes, hosting online educational events on fermented specialty crop fruits and vegetables, holding fermentation workshops, and conducting research to understand and minimize ferment variation and defects. This project will benefit 6,080 farmers and stakeholders and is expected to increase knowledge among consumers by 4,680 adults. This project will focus on berries and peppers, two crops for which there is popular interest, but scientifically tested recipes are unavailable. Project success will be measured using consumer and industry feedback, including surveys on technical knowledge gained and specialty crop fruit and vegetable intake, and by research on ferment consistency and how to reduce fungal-caused defects.

## *Slow Money San Luis Obispo (dba Harvestly)* *$249,617*

### Increasing Specialty Crop Awareness, Access, and Consumption on the Central Coast through Ecommerce and Education

The California Department of Food and Agriculture will partner with Slow Money San Luis Obispo (dba Harvestly) for a project that supports California's specialty crop farmers and stakeholders by increasing awareness, demand for, and access to specialty crops and equipping growers with effective marketing and sales tools. This project will benefit 4,800 farmers and stakeholders and is expected to increase specialty crop knowledge for 4,800 adults and children. The project will educate students, school staff, and consumers about the benefits of specialty crops by engaging students and parents through culinary kits, educational videos, and farm visits. The culinary kits will feature seasonal specialty crops, recipes, tasting exercises, educational materials, and videos highlighting specialty crops. The project will provide opportunities to experience locally sourced specialty crops through the kits and farm tours. Additionally, collaboration with San Luis Obispo County will expand access to specialty crops by providing culinary classes and support for families in exploring fresh, local ingredients. Students will gain knowledge of eight specialty crops through 16 culinary kits, 20 farm visits, and four specialty crop videos. San Luis Obispo County's software data tracking and evaluation forms will help assess improvements in specialty crop awareness, demand, and access.

## *With Love Community Programs* *$244,544*

### Community as Medicine: Senior Forward

The California Department of Food and Agriculture will partner with With Love Community Programs for a project that supports California's specialty crop farmers and stakeholders by increasing knowledge of and demand for specialty crops in South Los Angeles. The project will benefit 50 farmers and stakeholders and is expected to increase knowledge about specialty crops by 250 adults. With Love Community Programs will host a series of educational programs in South Los Angeles centering the role of specialty crops in the prevention, management, and treatment of major health concerns to encourage increased specialty crop consumption. Over four series, the program will explore various health concerns and a selection of specialty crops that address each condition, including 1) field trips to the Natural History Museum's edible garden, 2) a class on its medicinal qualities and possible treatment regimens led by a nutritionist, and 3) cooking demonstrations to share recipes which incorporate the crops into nutritious and easy-to-cook meals. Farmers and growers will participate as guest speakers to further encourage consumption of California specialty crops and to connect the specialty crop industry to this consumer audience. Success is defined by a greater interest in and knowledge of specialty crops indicated by surveys and a focus group from each of the series, audience retention, and the ability to share a digital toolkit

culminating the program and its findings with stakeholders to invest in senior health and specialty crop-related programs.

# OPPORTUNITY AND EDUCATION FOR ALL CALIFORNIA SPECIALTY CROP FARMERS

## *California Association of Resource Conservation Districts* *$249,776*

### Expanding Specialty Crop Agroforestry Demonstrations and Technical Assistance Through the California Farm Demonstration Network

The California Department of Food and Agriculture will partner with the California Association of Resource Conservation Districts (CARCD) for a project that supports California's specialty crop farmers and stakeholders by promoting increased adoption of agroforestry farming systems by specialty tree crops and other specialty crop growers. This project will benefit 365 farmers and stakeholders and is expected to increase knowledge gained about environmental sustainability practices, tools or techniques by 365 stakeholders. This project will showcase agroforestry demonstration sites. The project focus will be on areas in the Central Valley that have high potential for agroforestry implementation. Increased demonstration of agroforestry on the California Farm Demonstration Network (CFDN) and enhanced engagement with CFDN-related materials will indicate project success.

## *California Land Stewardship Institute* *$486,627*

### Providing Mendocino County Producers with Tools and Strategies

The California Department of Food and Agriculture will partner with the California Land Stewardship Institute (CLSI) for a project that supports California's specialty crop farmers by conducting outreach to specialty crop producers in Mendocino to implement needed training and education to drive adoption of best management practices on 10,000 acres across 120 farms by 2028. This project will benefit 120 farmers and stakeholders and is expected to increase knowledge gained about best practices, tools, and/or techniques for 120 farmers. Education and adoption of best management practices can help producers become more resilient.

## *California State University, Fresno Foundation* *$311,276*

### Promotional Training Resources to Enhance Irrigation Scheduling and Efficiency in Almonds and Pistachios

The California Department of Food and Agriculture will partner with the California State University, Fresno Foundation, for a project that supports California's specialty crop farmers by providing training programs for almond and pistachio growers in California's Central Valley. This project will benefit 360 farmers and stakeholders and is expected to increase the number of stakeholders that gained knowledge about environmental

sustainability best practices, tools, or technologies by 360 people. A series of training events will be organized, consisting of one workshop and one field day for each crop annually spanning three years, with surveys conducted to measure outcomes. Each event is expected to host at least 30 participants, with a projected attendance of 360 growers during the project. Additionally, two mobile applications and a website will be developed specifically for these crops to facilitate the dissemination of project materials to a broader audience.

*FarmsRus* *$241,406*

**Demonstration Trial of Soil and Water Management in Specialty Crops to Small Farmers**

The California Department of Food and Agriculture will partner with FarmsRus for a project that supports California's specialty crop farmers by setting up a demonstration trial to educate small farmers on best management practices. This project will benefit 550 farmers and stakeholders and is expected to increase the number of stakeholders that gained technical knowledge about producing, preparing, procuring, and/or accessing specialty crops by 400 farmers. This project aims to set up demonstration vegetable crops on single wire trellising systems grown in a high tunnel. Best management practices will be demonstrated via the control plots.

*Napa Valley Farmworker Foundation* *$500,000*

**Strengthening Roots: Workforce Innovation for Economic Sustainability in Viticulture**

The California Department of Food and Agriculture will partner with Napa Valley Farmworker Foundation (NVFF) for a project that supports California's specialty crop farmers by combatting labor shortages through training programs. This project will benefit 230 farmers and stakeholders and is expected to increase access of specialty crops and expand specialty crop production and distribution by maintaining 200 jobs. This project will meet the need to both retain and build the current winegrape workforce, and introduce new workers to the industry by, 1) executing a workforce training program and 2) expanding a mentorship program for high school and college students. Goals are higher wages and retention for participants and new careers created, evaluated by surveys and economic analysis.

*The Regents of the University of California, Davis* *$478,235*

**Outreach and Education to Support Food Safety Modernization Act Compliance**

The California Department of Food and Agriculture will partner with the University of California (UC), Davis, for a project that supports California's specialty crop farmers by

providing technical assistance and developing educational materials related to pre-harvest agricultural water assessments (AWA). This project will benefit 1,500 farmers and stakeholders and is expected to increase the number of specialty crop stakeholders who implement new/improved prevention, detection, control, and intervention practices, tools, or technologies to mitigate food safety risks for 500 stakeholders. Knowledge of AWA will be increased through the development of educational materials. Additionally, this project will assist directly in behavior change through water testing and technical assistance, leading to the impact of increased specialty crop grower compliance with the Produce Safety Rule. Success will be evaluated through contacts in education events, numbers of AWAs completed, and test results distributed.

## *Saticoy Food Hub* *$249,776*

### Saticoy Specialty Crop Initiative Programs

The California Department of Food and Agriculture will partner with Saticoy Food Hub for a project that supports California's specialty crop farmers by increasing the availability and consumption of specialty crops in Ventura County. This project will benefit 880 farmers and stakeholders and is expected to increase the knowledge gained about specialty crops among 880 adults and children. The project team will expand an existing backyard farming education program, Saticoy Sowers, to include specialty crop production and will host a Community Food System Conference in Saticoy for current and new producers. To increase demand for specialty crops, the project will develop a nutrition education program featuring cooking demonstrations and food sampling at the Saticoy Farmers' Market using a mobile teaching kitchen. This project aims to increase specialty crop production and consumption through community-driven education and awareness, fostering a robust community food system. Successful outcomes will be measured through tracking participation and evaluation surveys.

## *Students for Eco-Education and Agriculture* *$235,828*

### Demonstration Trial of Soil and Water Management in Specialty Crops to Small Farmers

The California Department of Food and Agriculture will partner with Students for Eco-Education and Agriculture (SEEAG) for a project that supports California's specialty crop farmers by preparing high school students to pursue agricultural careers that support the specialty crop industry's workforce needs. This project will benefit 2,500 farmers and stakeholders and is expected to increase the number of new individuals who entered specialty crop production as a result of marketing by 250 people. The Science, Technology, Engineering, and Mathematics (STEM) Career Pathways in Agriculture is a comprehensive, three-part program which includes an agricultural science laboratory, career guidance workshop, and field trip to a local specialty crop producer. The initiative leverages industry collaborations to align educational content

with local workforce needs, equipping students with practical knowledge and experiences to expand opportunities for economic mobility. With a community of partners in three counties, this project aims to invest in the next generation of agricultural leaders by addressing systemic challenges in workforce development and education. Partnerships with local colleges, farms, and businesses help cultivate a strong alumni network committed to continuously tracking and refining program outcomes.

# ENVIRONMENTAL STEWARDSHIP, CONSERVATION, AND SUSTAINABLE AGRICULTURE

*The Regents of the University of California, Agriculture and Natural Resources* *$498,275*

### Ag-Tech Innovations: Do-It-Yourself Low-Cost Real-Time Automated Irrigation for Small-Scale Diversified Vegetable Farms

The California Department of Food and Agriculture will partner with the University of California (UC), Santa Cruz, for a project that supports California's specialty crop farmers by improving on-farm irrigation scheduling by developing an automated system using affordable do-it-yourself, open-source, and easy-to-use tensiometers connected to irrigation valves. This project will benefit 530 farmers and stakeholders and is expected to expand specialty crop research development and improve environmental sustainability of specialty crops by accomplishing three research goals. Activities include science-based technology prototyping, writing guidelines, outreach, and project impact assessment. Anticipated outcomes include developing technical skills and applied knowledge of farmers, deploying the technology across greater than 170 farms. The project will be evaluated through analysis of data acquired from surveys and the agricultural-technology system deployed.

*The Regents of the University of California, Agriculture and Natural Resources* *$348,695*

### Optimizing Nitrogen-Fixing Bacterial and Mycorrhizal Biostimulants on Nutrient Management of Asian Vegetables

The California Department of Food and Agriculture will partner with the University of California (UC), Agriculture and Natural Resources, for a project that supports California's specialty crop farmers by creating transferable, science-based information on best practical use of nitrogen (N) fixing bacterial and mycorrhizal biostimulants to improve Asian vegetable production and nutrient management. This project will benefit 230 farmers and stakeholders and is expected to increase the number of producers that adopt environmental best practices or tools by 130 people. Through implementing carefully designed on-farm collaborative trials, the project will help growers break language barriers. It is anticipated that this project will enable small-farm vegetable growers to minimize guesswork on optimal use of microbial biostimulants to improve N and other nutrient use efficiency while possibly reducing the amount of synthetic fertilizers. In the meantime, through acre-basis economic comparisons, those growers

will reduce production cost for fertilizers. Finally, the application protocols of microbial biostimulants on representative vegetable species through this project will be expanded to other Asian vegetables and small-farm growers elsewhere.

*The Regents of the University of California, Agriculture and Natural Resources* *$494,866*

**Productivity Potential of Agave Species in San Joaquin Valley**

The California Department of Food and Agriculture will partner with the University of California (UC), Agriculture and Natural Resources, for a project that supports California's specialty crop farmers by establishing long-term research trials at to examine the influence of irrigation and fertilization on survivorship, biomass yields, carbon dioxide uptake, and water use of Agave americana (A. americana) and Agave salmiana (A. salmiana) and their potential for soil health improvement. The project will benefit 75 farmers and stakeholders and is expected to reach 75 industry representatives and other stakeholders who engaged with research results. Results will be communicated to multi-stakeholders through outreach via several platforms.

*The Regents of the University of California, Davis* *$498,991*

**A New 'Green Carpet' for California: Groundcovers for Urban Landscapes**

The California Department of Food and Agriculture will partner with the University of California (UC), Davis, for a project that supports California's specialty crop farmers by testing new and traditional groundcovers as potential turf alternatives. This project will benefit 500 farmers and stakeholders and is expected to increase the number of stakeholders that gained technical knowledge about producing, preparing, procuring, and/or accessing specialty crops by 500 people. The project team will work with diverse partners to test new and traditional groundcovers as potential turf alternatives, in both shaded and full sun conditions. This project will establish common garden trials in Northern California and Southern California and impose an irrigation regime to test plant water use, growth, and performance. Plants will undergo a trampling regime to measure their ability to withstand human traffic. This project will enable growers to focus productions on new plants and stimulate demand via outreach to the landscape industry.

*The Regents of the University of California, Davis* *$487,633*

**Almond Irrigation by Variety to Enhance Yield, Water Usage, Nitrogen Use Efficiency, and Profitability**

The California Department of Food and Agriculture will partner with the University of California (UC), Davis for a project that supports California's specialty crop farmers and stakeholders by evaluating the effect of the irrigation of almonds by variety on yield,

water use, Nitrogen (N) use efficiency, and profitability. This project will benefit 1,400 farmers and stakeholders and is expected to increase the number of stakeholders that gained knowledge about best practices, tools, or technologies for 2,100 individuals during the project duration. Almond orchards are planted with multiple varieties in alternating rows, which is necessary for cross-pollination between varieties to enhance yield. Traditional irrigation systems are designed to apply the same amount of water and fertilizers to all varieties in an irrigation block based on the nonpareil variety. However, different varieties have varying water and nutrient needs, which leads to lower water use efficiency and N use efficiency. Almond varieties are usually harvested at different times. Post-harvest irrigation of earlier harvested varieties is affected by delays due to harvesting operations of later-maturing varieties. To cope with water supply challenges due to Sustainable Groundwater Management Act and N regulations, such as the Irrigated Lands Regulated Program, plus rising costs of fertilizers, there is an urgent need to optimize water use efficiency and N use efficiency (NUE).

*The Regents of the University of California, Davis* *$446,432*

**Assessing the Impact of Heat Waves on Sunflower Pollination to Promote Resilient Summer Seed Crops**

The California Department of Food and Agriculture will partner with the University of California (UC), Davis, for a project that supports California's specialty crop farmers by investigating the effect of heat waves on sunflower pollination. This project will benefit 85 farmers and stakeholders and is expected to yield three new findings that allow for implementation of new practice, process, or technology. This project aims to fill critical knowledge gaps on how heat waves, 1) affect pollen production of sunflower cultivars, 2) impact the abundance and visitation of sunflower pollinating bees, 3) disrupt crop seed production across pollination stages to identify the limiting step(s), and 4) use results to guide growers and seed producers on possible adjustments of planting times and locations to minimize heat wave effects and support the requirements of a diverse community of sunflower pollinators. Project success will center on the identification and extension of strategies to stakeholders that enhance the resilience of summer seed crops.

*The Regents of the University of California, Davis* *$457,082*

**Enhancing the Economic and Environmental Sustainability of Vegetable Production**

The California Department of Food and Agriculture will partner with the University of California (UC), Davis, for a project that supports California's specialty crop farmers by demonstrating the practicality and evaluating changes in the agronomic performance of processing tomatoes and cabbages when integrated with solar energy production. This project will benefit 500 farmers and stakeholders and is expected to increase knowledge

gained by 500 stakeholders and adopted by 200 stakeholders. Economic and biophysical models will be developed to generalize the agrovoltaic (AV) systems assessments. The project outcome will be widely shared through interactive workshops, seminars, and site visits to inspire adoption and promote stakeholder support. Data from field experiments, economic and biophysical models, and stakeholder feedback gathered through questionnaires will be analyzed to assess the project's success.

## *The Regents of the University of California, Riverside* *$497,059*

### Increasing Avocado's Resilience by Identifying Superior Salinity Tolerant Rootstock and Scion Combinations

The California Department of Food and Agriculture will partner with the University of California (UC), Riverside, for a project that supports California's specialty crop farmers by identifying the best rootstock and scion combinations to mitigate salinity stress and elucidate the salinity tolerance mechanisms in rootstocks. This project will benefit 500 farmers and stakeholders and is expected to develop four cultivars and/or seed varieties and release two. By coupling phenotypic, physiological, and production data with cellular, anatomical, ionomic, and transcriptomic data under greenhouse and field conditions, this project will identify the best rootstock and scion combinations to mitigate salinity stress and elucidate the salinity tolerance mechanisms in commercial and UC Riverside rootstocks. Outcomes and knowledge gained will be disseminated through annual presentations at grower's seminars, workshops, and field days. Success will be assessed by paper-based surveys, adoption of rootstock and scion recommendations, shifts in rootstock and scion patterns, and number of growers willing to participate in future rootstock trials.

## *The Regents of the University of California, Santa Cruz* *$489,435*

### Small Intelligent Electric Safe Tractor Assistance

The California Department of Food and Agriculture will partner with the University of California (UC), Santa Cruz, for a project that supports California's specialty crop farmers by developing AgTech tools and technologies to support mechanization innovation for three essential operations: planting, weeding, and harvesting. This project will benefit 1,955 farmers and stakeholders and engage 1,500 industry representatives and stakeholders with the research results. This project will, 1) work on-farm, to deploy new electric micro-tractor robots (ETR) with cohort farms and collaborate with regional fabricators to co-develop tools; and 2) simultaneously advance opportunities for autonomous navigation at UC Santa Cruz to assist specialty crop producers and increase safety of operations with computer vision guided navigation applications. These two pathways will intentionally intersect to ensure each informs the other and that the respective knowledge and experience of both pathways provide opportunities for truly collaborative innovation to meaningfully support specialty crop producers.

*University Corporation at Monterey Bay* *$493,875*

## Evapotranspiration Tools for Vegetable Crop Water Use with Central Coast Focus

The California Department of Food and Agriculture will partner with the University Corporation at Monterey Bay (CSUMB) for a project that supports California's specialty crop farmers and stakeholders by developing cost-effective, easy-to-use decision tools for water use. This project will benefit 250 farmers and stakeholders and is expected to generate four publications within the grant duration. Eddy covariance systems, which are the scientific community's preferred evapotranspiration (ET) measurement method, will be deployed to measure crop water consumption as ET in three vegetable crops. Performance of relatively inexpensive commercial ET sensors will be evaluated for practical deployment by University of California (UC), Cooperative Extension, agents or growers. The CropManage and OpenET web applications will be further evaluated and demonstrated for irrigation decision-support and evaluation of net groundwater extractions at basin scale. Both systems are currently beta-testing streamlined versions designed for ease of use by irrigators, regulators, and other stakeholders.

# PLANT HEALTH AND PEST MANAGEMENT

*U.S. Department of Agriculture, Agricultural Research Service* *$393,351*

### Deciphering Strategies for the Genetic Improvement of Lettuce for Resistance to Fusarium Wilt Disease

The California Department of Food and Agriculture will partner with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), for a project that supports California's specialty crop farmers by developing lettuce germplasm with resistance to Fusarium wilt, a major pest for California lettuce growers. This project will benefit 100 farmers and stakeholders and is expected to increase the number of industry representatives and other stakeholders who engaged with research results by 10 people. The project objectives are to, 1) identify quantitative trait loci (QTL) that contribute to resistance and develop molecular markers for molecular-assisted breeding, 2) describe gene expression patterns in resistant and susceptible genotypes to confirm QTL and genetic markers, and 3) develop lettuce germplasm with broad spectrum resistance against multiple races. Success will be indicated by research publications, presentations at industry meetings, and requests for information.

*U.S. Department of Agriculture, Agricultural Research Service* *$195,850*

### Development and Release of Lettuce with Resistance to Impatiens Necrotic Spot Virus

The California Department of Food and Agriculture will partner with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), for a project that supports California's specialty crop farmers by identifying and characterizing new sources of resistance and development and publicly releasing the improved lettuce germplasm. This project will benefit 205 farmers and stakeholders and is expected to release six new cultivars and/or seed varieties. With the goal of releasing impatiens necrotic spot virus (INSV) resistant lettuce, the project will, 1) combine two sources of partial resistance into a single genotype, 2) track inheritance of INSV resistance, and 3) develop and release improved germplasm. Success will be indicated by releasing new lettuce germplasm, publications, and requests for seeds and information.

*U.S. Department of Agriculture, Agricultural Research Service* *$464,581*

### New Surveillance Tools for Detecting Thrips and Thrips-Transmitted Viruses

The California Department of Food and Agriculture will partner with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), for a project that supports California’s specialty crop farmers and stakeholders by developing more efficient and cheaper methods for detecting viruses that threaten lettuce crops. This project will

benefit 150 farmers and stakeholders and is expected to increase the number of stakeholders that gained knowledge about science-based tools to combat pests and diseases by 150 people. Through this project, the team will develop a novel surveillance tool that is more efficient and cheaper than existing methods and provides the added capability of identifying virus-infected thrips populations. Success will be measured by the performance of the trap; outcomes will be shared with stakeholders at annual pest management meetings and blogs.

*The Regents of the University of California, Davis* *$499,643*

### Development of Novel Insect Pest Control Method for Stored Tree Nuts Using Silica Nanoparticles

The California Department of Food and Agriculture will partner with the University of California (UC), Davis, for a project that supports California's specialty crop farmers by significantly reducing product and quality loss, chemical use, and costs, making the industry more economically competitive and sustainable. This project will benefit 300 farmers and stakeholders and is expected to increase the number of stakeholders that gained knowledge about science-based tools to combat pests and diseases by 1,500. This project will develop an insect pest control method using silica nanoparticles to demonstrate the effectiveness and benefits of silica nanoparticles against storage insect pests of tree nuts.

*The Regents of the University of California, Davis* *$401,709*

### Harnessing Bacillus PGPR Strains to Manage Gray Mold Disease and Improve Strawberry Production in California

The California Department of Food and Agriculture will partner with the University of California (UC), Davis, for a project that supports California’s specialty crop farmers by evaluating various Bacillus strains and developing enhanced ones with stronger biofilm formation and antimicrobial activity, for improved biocontrol efficacy. This project will benefit 180 farmers and stakeholders and is expected to increase the number of stakeholders that gained knowledge about science-based tools to combat pests and diseases by 100 people. The effectiveness of the Bacillus strains will be tested in greenhouse trials under relevant conditions. Findings will be shared through field days, presentations, and collaboration with the UC Agriculture and Natural Resources farm advisors and the Fruit and Nut Research and Information Center. Success will be measured by the availability of these strains and their adoption by growers, offering a sustainable and effective solution for gray mold control.

*The Regents of the University of California, Riverside* *$497,649*

**Determining the Causal Agents of Walnut Replant Disease and Testing New Treatments**

The California Department of Food and Agriculture will partner with the University of California (UC), Riverside, for a project that supports California's specialty crop farmers by reducing the large losses caused by walnut replant disease (WRD) and replant diseases of other California specialty crops. This project will benefit 400 farmers and stakeholders and is expected to increase the number of industry representatives and other stakeholders who engaged with research results by 400 people. Project objectives are to determine whether this microbe causes WRD and test new treatments. This project will be deemed successful if the team demonstrates this microbe that causes walnut replant disease. The team expects identifying the causal agent will lead to new, effective, and more sustainable WRD treatments and increased production efficiency.

*The Regents of the University of California, Riverside* *$495,755*

**Development of Improved Long Bean Varieties with Stacked Resistance Traits Through Modern Breeding and Community Engagement**

The California Department of Food and Agriculture will partner with the University of California (UC), Riverside, for a project that supports California's specialty crop farmers utilizing resources developed from a prior project in modern breeding and extension strategies to improve existing varieties of long bean. This project will benefit 50 farmers and stakeholders and is expected to release four new cultivars and/or seed varieties. Germplasms resistant to either aphid or root-knot nematodes will be intercrossed and backcrossed to stack resistance genes and reduce yield drag using DNA markers. New vine-type varieties resistant to both types of pests will be developed and tested with farmer input. Novel resistant no-trellis bush-type varieties will also be developed to enable scaling up production in commercial organic farming.

*The Regents of the University of California, Riverside* *$406,628*

**Improving Management of Recently Emerged, Whitefly-Transmitted Cucurbit Viruses in the Southwestern United States**

The California Department of Food and Agriculture will partner with the University of California (UC), Riverside, for a project that supports California’s specialty crop farmers by creating multiplex diagnostics, identifying non-cucurbit crop and weed reservoirs, proactively surveying for new virus threats, and determining seasonal vector and virus dynamics in areas where viruses are emerging. This project will benefit 120 farmers and stakeholders and is expected to increase the number of stakeholders that gained knowledge about science-based tools to combat pests and diseases by 120. With stakeholder feedback, the team will develop control options and risk assessments and

communicate via presentations, factsheets, guidebooks, and protocols housed on the Emerging Viruses in Cucurbits Working Group (EVCWG) website, which benefits stakeholders nationwide. Changes in knowledge and actions will be quantified by measuring the numbers of stakeholders who indicate they learned new information and/or changed practices as a result of project deliverables.

# FOOD SAFETY

*The Center for Produce Safety* *$446,174*

## Automated Compost Monitoring with Low-Cost RFID, Drones, and Machine Learning for Improved Control and Pathogen Safety

The California Department of Food and Agriculture will partner with the Center for Produce Safety (CPS) for a project that supports California's specialty crop farmers by developing an intelligent, automated system to monitor the composting process for safer and more efficient commercial composting. This project will benefit 78 farmers and stakeholders and is expected to increase the number of prevention, detection, control, or intervention practices developed or enhanced to mitigate food safety risk by one. CPS will partner with the University of Tennessee to place low-cost radio-frequency identification (RFID) sensors throughout compost piles to measure temperature and moisture, and use drones equipped with RFID readers to autonomously collect data and record precise locations. Machine learning algorithms will analyze the data to identify cold and hot spots in real time, helping compost operators adjust turning schedules and ensure uniform heating. A data visualization toolbox will be developed and validated for accuracy and reliability at two commercial composting sites for real-world process control. The project aims to establish scientifically validated guidelines for sensor deployment and data recording to enhance compost monitoring consistency and support decision-making, to mitigate cross-contamination risk. Results of this study will be summarized in project reports, presented at the annual CPS Research Symposium, and published in open-access peer-reviewed journals.

*The Center for Produce Safety* *$482,015*

## Can Clean Get Cleaner? Evaluation of Cleaning and Sanitation Process Improvements for Harvest Equipment of Leafy Greens

The California Department of Food and Agriculture will partner with the Center for Produce Safety (CPS) for a project that supports California's specialty crop farmers by refining industry cleaning and sanitation practices for mechanical harvesters of leafy greens. This project will benefit 84 farmers and stakeholders and is expected to increase the number of prevention, detection, control, or intervention practices developed or enhanced to mitigate food safety risk by one. CPS will partner with the University of Arizona to assess the impact of harvester sitting time, continuous sanitizer use, the use of two sanitizers not evaluated previously, and improved tool usage to refine industry practices to enhance harvest equipment sanitation efficacy. Success of the project will include an increased understanding of the impact of time, temperature, and complete coverage of sanitizer on cleaning and sanitation efficacy. This project will provide real-world data to inform and improve industry practice, leading to reduced risk.

Results of this study will be summarized in project reports, presented at the annual CPS Research Symposium, and shared with the harvest companies who agree to participate in the project.

*The Center for Produce Safety* *$368,676*

### Characterization and Control of Food Safety Risks Associated with Indoor Leafy Green Growing and Harvest

The California Department of Food and Agriculture will partner with The Center for Produce Safety (CPS) for a project that supports California's specialty crop farmers by providing science-based insights into food safety risks associated with controlled environment agriculture systems for leafy greens. This project will benefit 100 farmers and stakeholders and is expected to increase food safety knowledge and processes by one. CPS will partner with the University of California, Davis, to investigate cross contamination and pathogen persistence associated with recirculated nutrient solutions and major types of growth substrate in a model hydroponic system, and potential bactericidal effects of light-emitting diodes (LED) light exposure in plant growth. Success of this project will include a better understanding of the unique controlled environmental agriculture industry practices; guide the development of growth substrate and nutrient solution handling practices to minimize contamination; and facilitate the design of light exposure schemes, promoting both quality and safety of the produce. Results of this study will be summarized in project reports, presented at the annual CPS Research Symposium, and published in peer-reviewed journals.

*The Center for Produce Safety* *$331,419*

### Developing Methods to Assess Risk to Crops Exposed to Animal Facility Fugitive Dust

The California Department of Food and Agriculture will partner with The Center for Produce Safety (CPS) for a project that supports California's specialty crop farmers in determining appropriate setback distances from small-scale cattle operations to produce fields. This project will benefit 1,463 farmers and stakeholders and is expected to increase food safety knowledge and processes by one. CPS will partner with the University of California, Davis, to conduct field trials over two years to evaluate the presence of indicator organisms in fugitive dust generated by a 100-head cattle operation. Environmental sampling will be conducted to collect field data on the distances that dust and indicator organisms associated with dust travel and how activities at the cattle operation influence dust release. Contamination of romaine lettuce, bulb onions, and cantaloupe grown near the cattle operation will be evaluated over two seasons to determine crop-specific risk factors. These data can help to inform appropriate setback distances and can also provide methods that can be used for future studies evaluating risk associated with fugitive dust. Results of this study will be summarized in project reports and presented at the annual CPS Research Symposium.

*The Center for Produce Safety* *$464,175*

## Evaluation of Grower Practices to Reduce Mitigate Risks Associated with the Use of BSAAOs in Leafy Greens

The California Department of Food and Agriculture will partner with the Center for Produce Safety (CPS) for a project that supports California's specialty crop farmers by improving how biological soil amendments of animal origin (BSAAO) are tested, stored, and applied in leafy greens production to reduce contamination risks. This project will benefit 84 farmers and stakeholders and is expected to increase the number of prevention, detection, control, or intervention practices developed or enhanced to mitigate food safety risk by one. CPS will partner with the University of Arizona to work with producers to assess finished crop inputs (cattle compost and heat-treated poultry pellets) for indicator and pathogenic bacteria; evaluate how storage and grower application practices at field scale impact bacterial survival and persistence; examine the impact of weather conditions on bacterial growth and persistence within the growing environment; and assess generation, composting, and storage conditions associated with the physiological state of pathogens. Success of the project will include an improved understanding of the impact of specific industry practices on organisms that may commonly be present in crop inputs and strategies to reduce those risks. This project will equip leafy green producers with science-based best practices for BSAAO use and application at the field scale. Results of this study will be summarized in project reports and presented at the annual CPS Research Symposium.