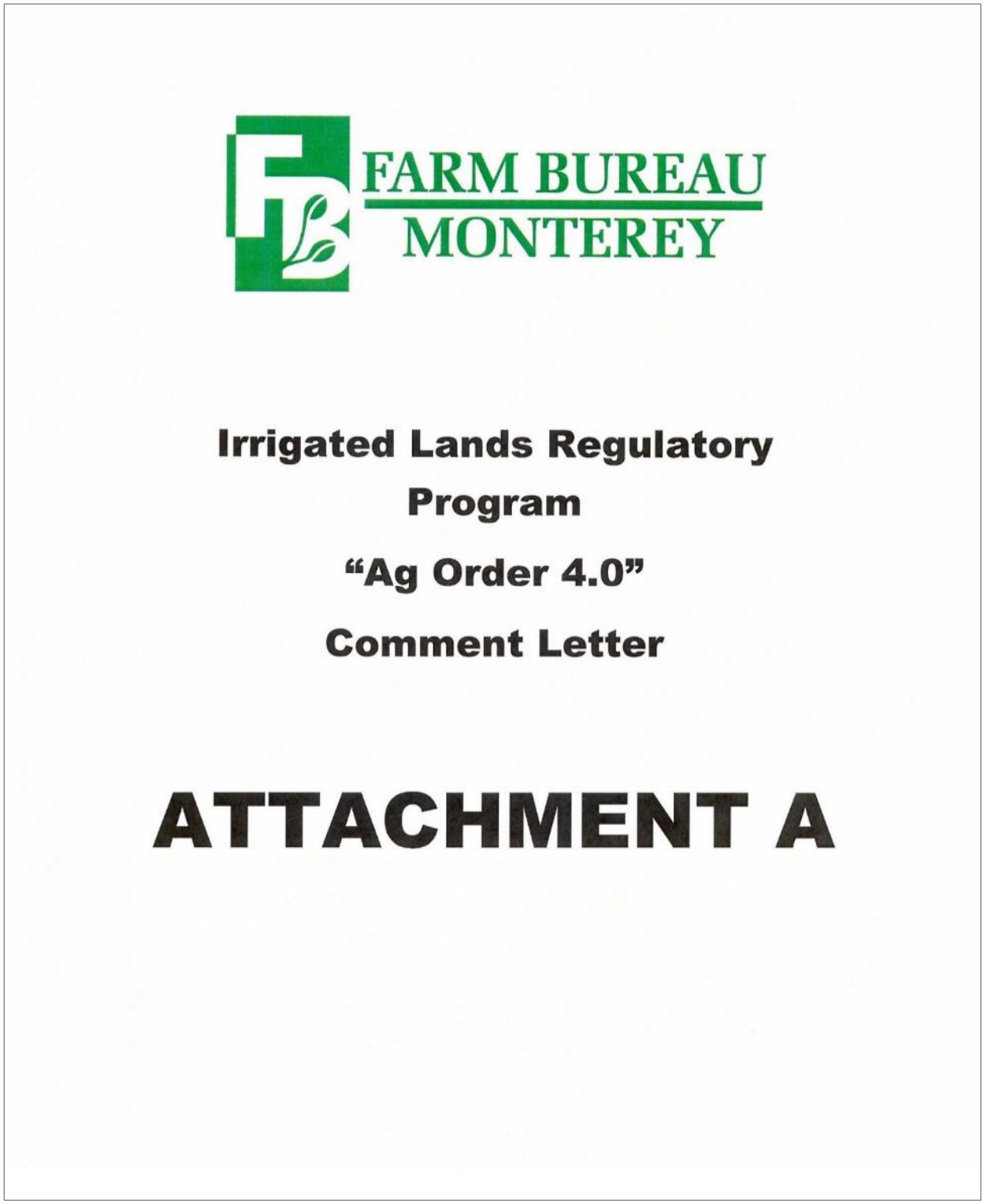
3.3 Comment Letter Attachments

Certain comment letters included attachments or materials that were voluminous and did not provide specific, substantive comments on the DEIR or DAO 4.0. These attachments and materials were reviewed and considered in responding to the specific, substantive comments contained within the respective letters, but were not themselves bracketed or individually responded to. To aid the readability and navigability of the document, these voluminous attachments and materials are included here rather than with the specific, substantive portions of the letters, which are included in Section 3.2.

Attachments to Letter AR: Norman C. Groot, Monterey County Farm Bureau (June 19, 2020)



A Decade of Change: A Case Study of Regulatory Compliance Costs in the Produce Industry

Lynn Hamilton[1]
and
Michael McCullough[2]
Cal Poly, San Luis Obispo

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[1] Lynn Hamilton, Ph.D., is a Professor of Agribusiness at Cal Poly, San Luis Obispo
[2] Michael McCullough, Ph.D., is an Associate Professor of Agribusiness at Cal Poly, San Luis Obispo

EXECUTIVE SUMMARY:

Regulatory pressure is a source of increasing concern to the California agricultural industry. In the decade since 2006, new rules at both the state and federal levels have imposed significantly higher regulatory burdens on growers, specifically with respect to food safety, water quality, labor wages, air quality; and worker health and safety. Additional regulations are in process as the Sustainable Groundwater Management Act is developed at the local levels for implementation in 2022, and minimum wage and overtime laws for farmworkers are phased in, also by 2022.

Previous studies regarding the regulatory environment in California have quantified the total cost of regulation on the state's agricultural producers. The goal of this project was to update a 2006 case study that documented the regulatory costs on a commercial-scale head lettuce grower in the Salinas Valley. The same grower was willing to cooperate on this study, and we used 2017 as the current year, primarily because it was the most recently completed full production year.

In the 2006 study, the cooperating lettuce grower reported regulatory costs totaling $109.16 per acre or 1.26% of total production costs. Lettuce production costs in 2006 were $8,793 per acre. Workers' compensation was by far the highest regulatory cost for the California producer, totaling almost $59 per acre, followed by pesticide regulations that totaled nearly $23 per acre. Assessments per carton from lettuce marketing orders comprised nearly $20 per acre. Other regulatory costs included water quality, food safety, worker education and training

However, by 2017, the regulatory landscape had significantly changed, precipitated by a 2006 E. coli outbreak in spinach in the Salinas Valley (that occurred after the 2006 data was collected) that altered the landscape for food safety compliance. New environmental and worker wage and safety laws were also imposed in the ensuing years. The 2017 reported regulatory costs were $977.30 per acre, or 8.90% of total production costs. Total production costs in 2017 were $10,977 per acre for this grower. Workers' compensation was again the highest cost of regulatory compliance and had risen to $336 per acre. Labor wage regulations comprised another $189 per acre, and food safety compliance followed closely behind at $181 per acre. Affordable Care Act requirements added $141 per acre, while pesticide regulatory compliance totaled over $35 per acre. Other regulatory compliance costs totaled between $5.50 and $28 per acre.

The results of this case study show that, for this lettuce grower, production costs have increased by 24.8% from 2006 to 2017, but the costs of regulatory compliance have risen by 795%. A summary of the most notable changes in regulations from 2006 to 2017 are listed on the following pages.

Summary of Major Regulatory Changes Affecting Agriculture, 2006-2017

Food Safety

- 2007: The Leafy Greens Marketing Agreement: passed by California leafy greens grower and handlers; requires growers to create and follow a food safety plan and trace-back program, environmental assessments for food safety risks, extensive water and soil amendment testing and certification, and field audits to verify compliance with worker practices and field sanitation.

- 2011: Food Safety Modernization Act: incorporated Hazard Analysis and Critical Control to the food system, increased inspections and food safety practices on the farm and in the handling/processing sectors. Adopts many of the same practices in the fresh produce sector (known as the Produce Safety Rule) as the LGMA; the LGMA updated its metrics in 2018 to align with FSMA.

Air Quality:

- 2006: AB 32, California Global Warming Solutions Act. Instituted a cap-and-trade system for greenhouse gas emission reductions with the goal of reducing California's GHG emissions to 1990 levels by 2020.

Water Quality:

- 2012 and 2017: Updates to the Region 3 (Central Coast) Irrigated Lands Regulatory Program. Groundwater well monitoring was added in 2012, and as of 2017, all Tier 2 and Tier 3 (medium and large) farms must report total nitrogen applied to their crops.

- 2014: Sustainable Groundwater Management Act: requires critical and high-priority groundwater basins to develop a local Groundwater Sustainability Authority by January 2018, which are then tasked with developing Groundwater Sustainability Plans to prevent further groundwater overdraft and pollution.

Labor Health and Safety

- 2010: Affordable Care Act: Requires employers with at least 50 employees to provide health insurance.

- 2014: AB 1522, Healthy Workplace, Healthy Family Act: As of July 1, 2015, employers must provide paid sick leave to any full or part-time worker; employees earn at least one hour of paid leave for every 30 hours worked.

- 2015: Cal OSHA updated its Heat Stress Prevention regulations, requiring shade and water provision to outdoor employees when the temperature reaches 80° F, as well as supervisor and employee training about heat stress prevention.

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Labor Wages

- 2016: AB 1513, Piece Rate Compensation: As of July 1, 2016, companies that employ piece-rate workers are required to compensate unproductive time (i.e. rest breaks) at either the legal minimum wage or the workers' average wage, whichever is higher, and employees must receive documentation of the non-productive time on their pay stubs.

- 2016: SB 3, Minimum Wage Phase-In Requirement: California employers with 26 or more employees must scale up minimum wage, starting at $10.50/hr in 2017 to $15/hr by 2022. Employers with 25 or fewer employees have an additional year to phase in the increases.

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Introduction

The regulatory environment in California is constantly evolving in response to new laws, policies, and legislative mandates. Regulations can provide benefits to the agricultural industry and society at large by increasing food safety, improving air and water quality, and improving conditions for farm workers. However, regulations also impose compliance costs on agricultural businesses. Regulatory costs can be classified as either direct, involving a cash outlay in response to the regulation, or indirect, involving an opportunity cost to the business or industry as a result of the regulation. Both direct and indirect costs of regulations to agricultural producers in California have been increasing in recent years. For example, in 2012 groundwater regulations were added to the Irrigated Lands Regulatory Program, which was initiated in 2003 to regulate run-off from irrigated acreage. AB 32, the California Global Warming Solutions Act of 2006, which requires reduction of greenhouse gas emissions, imposes more stringent emissions standards for agricultural equipment and animal agriculture. SB 700, signed in 2003, brought agriculture into compliance with federal air quality regulations in 2006. Cal OSHA adopted the nation's first heat stress regulations in 2006 that required farm managers and contractors to provide shade structures, breaks and cold water for farm employees; these were strengthened in 2015. Federal laws affecting agriculture include the Affordable Care Act, which requires health care benefits to be paid by many employers.

This paper presents a follow-up of a 2006 study of regulatory costs for a large Salinas Valley lettuce grower (Hamilton 2006). In the months following the original study, an historic E. coli outbreak in spinach significantly changed the regulatory landscape for food safety in leafy greens with the implementation of the Leafy Greens Marketing Agreement, followed several years later with the Produce Rule of the Food Safety Modernization Act, in addition to the environmental and worker laws noted above. This study documents both the direct cash and indirect opportunity costs of compliance in 2017 and compares them to the original 2006 costs for the same grower. The 2006 study found that regulatory compliance costs totaled $109.16 per acre, or 4.25% of cultural costs and 1.26% of total production costs (Hamilton 2006). The same study compared the costs of regulation between California and Arizona for lettuce production, and between

California and Texas for citrus. California's costs of regulation in lettuce were 55.7% higher than Arizona's ($109.16 vs. $70.10 per acre) and in citrus, California growers' regulatory compliance cost was 994.7% higher than Texas's ($347.12 vs. $31.71 per acre) (Hamilton 2006).

As in 2006, lettuce continues to be an important crop in California, consistently ranked in the top five commodities in California. The most recent California agricultural statistics for lettuce in the 2016 crop year reported a value of $1.96 billion in farmgate sales and 209,100 harvested acres. California grows 68% of all lettuce in the U.S. Monterey County, where the data for this study was collected, produces 64% of California's lettuce (CDFA).

Very few studies exist that examine the costs of regulation at the producer level. A study completed in 2006 estimated the total cost of regulatory compliance for specialty crop[1] producers in California to be more than $2 billion (approximately 10% of cash receipts) per year (Hurley and Noel 2006). The increasing complexity of the regulatory environment in California has been cited by several studies as an area of growing concern for California producers and a factor that is likely to have negative impacts on the future competitiveness of the industry (Hurley 2005; Johnston and McCalla 2004; Noel, Paggi, and Yamazaki 2013). A UC Davis study documenting growers' cost of compliance with the 2007 Leafy Greens Marketing Agreement found an average modification cost for food safety at $13.60 per acre, and seasonal food safety compliance cost of $68.93 per acre. However, the authors note that growers underreported some costs and estimated the likely combined cost at closer to $100 per acre (Hardesty and Kusunose 2009).

A study of regulatory costs accruing to agriculture in 2012 in the San Joaquin Valley found regulatory compliance for labor and environmental laws was between .98% and 5.6% of cash operating costs. This study investigated 22 growers across the eight most important crops in the Central Valley (McCullough et al., 2018).

Problem Statement: This study will update and expand upon a case study conducted in 2006 to examine the expanded array of regulatory costs faced by California farms. In 2016, California producers sold over $45 billion of farm-gate products (CDFA).

[1] Specialty crops include fruits, vegetables, nuts, and nurseries.

However, other states (and countries) produce a number of similar agricultural products, and California producers could be at a competitive disadvantage if their costs of regulation are significantly higher.

Objectives: To conduct a case study analysis of 2017 regulatory costs in lettuce production, and compare them to the regulatory costs documented in 2006 with the same grower in the Salinas Valley. We also review the changes in regulations for California agriculture since 2006, primarily with respect to food safety, water quality, groundwater legislation, and labor regulations including minimum wage, overtime and worker health and safety protocols. The findings of this study will provide the agricultural industry and policy makers with more complete information when making policy decisions regarding regulatory issues for California farmers.

Methodology

Western Growers' Association agreed to assist in identifying cooperating grower for the study in 2006, and the same grower was contacted in 2017 to confirm participation for this study. The initial interview took place in March 2018, with follow-up emails for additional information following in later months; confirmation for all data was provided in August 2018. The cooperating producer was assured anonymity as proprietary production cost data would be the centerpiece of the study.

In addition to the regulatory cost interview, we used the 2017 U.C. Davis Extension cost of production budget for head lettuce in the Salinas Valley (Tourte, et al. 2017). This was used as a means to help identify production areas in which regulatory costs might occur. It also provided a baseline from which to compare the growers' production costs.

A review of recent regulatory cost studies, cited above, provided background for the types of regulatory pressures that growers may face. Regulatory changes since 2006 were reviewed and are included in the regulatory cost narrative. Of particular note, major changes in food safety, labor wages, employee health and safety rules, water quality and groundwater allocation have either gone into effect or are being phased in as of 2017.

The cooperating grower was provided a spreadsheet that outlined the regulatory cost areas that were expected to impact the operations. They were asked to estimate the

annual amount of time maintaining compliance in each regulatory area; the value of that time; whether it was their time or an employee's; and to provide the fees they were assessed for any permits, licenses, training sessions or exams. In some cases, the regulatory costs in question accrued to the entire farm operation, while some regulatory costs could be segmented specifically to the iceberg lettuce portion of the farm. In the cases where the regulatory costs accrued to the entire farm, the costs were apportioned to the iceberg lettuce operation. This information was collected during an in-person interview with the owner(s) and relevant staff members. The owners were also asked to provide the annual production budgets for their crops, as a means to compare the impact of regulatory expenses on their growing costs. A total cost of regulation was summarized for the grower, and the regulatory cost per acre was calculated and compared to the 2006 findings. We do not report the total farm acreage or proportion devoted to lettuce to maintain confidentiality. However, the lettuce grower fits into the "large" grower category (greater than 1,000) acres as defined by the U.S. Census of Agriculture.

Results

The discussion and regulatory cost areas are divided into the following categories:

- Education and Training for Regulatory Compliance
- Air Quality Requirements
- Water Quality Requirements
- Department of Pesticide Regulation
- Food Safety
- Workers Compensation
- Affordable Care Act
- Labor Health & Safety Requirements
- Assessments

Education and Training for Regulatory Compliance

This category summarized all education and training efforts on the part of the grower to maintain compliance with Cal OSHA as well as pesticide and food safety requirements. In 2006 all of the costs of this category were due to the grower's time spent in staying current with worker safety laws and environmental issues, and amounted to $1.27 per acre. However, in 2017, much more was required of growers in terms of worker training, and employee training time also became part of this category. The

operation has added a full-time human resources staff member at a $72,500 annual salary to handle employee regulatory compliance issues. This staff person manages on-boarding training with all employees with respect to health/safety compliance required by Cal OSHA and the Department of Pesticide Regulation, and the grower estimated that the staff member spends 50% of his time on this effort. The Worker Protection Standard, updated for 2017 by the California Department of Pesticide Regulation, requires the staff member to attend a "train the trainer" session; the training fees, travel and hotel stay costs $750.

All workers must go through the Worker Protection Standard training for 30 minutes annually. The grower has 100 workers for the lettuce operation. In addition, these employees must take part in food safety/pesticide training every two weeks for 30 minutes. Four supervisors and three foremen are also involved, and the farm's HR staff person runs these meetings. In addition, all managers (which includes supervisors and foremen) must take part in sexual harassment training every two years; this amounts to an hour per year. One of the ranch owners spends about 30% of his time on regulatory compliance with the Leafy Greens Marketing Agreement and worker safety. His salary is $150,000 per year.

The sum of the education and training efforts for regulatory compliance are $26.31 per acre annually for this grower – a 1,966% percent increase from 2006's value of $1.27 per acre.

Air Quality Requirements

The Federal Clean Air Act requires the Environmental Protection Agency to authorize state implementation of air quality plans. The main component of the Clean Air Act that concerns agriculture is compliance with National Ambient Air Quality Standards, which sets limits on six pollutants known to cause health hazards, environmental damage, and/or contribute to the formation of smog: ozone, particulate matter, sulfur dioxide, carbon monoxide, nitrogen dioxide and lead. The EPA mandates a national standard in each of these pollutants. Each state is required to submit a State Implementation Plan to reduce or maintain pollutant levels below those standards. The regulatory burden in each region is based primarily on whether the air quality in that

region meets or exceeds the pollutant levels set by the EPA under Title V, which requires the monitoring of and meeting standards for major source pollutants. This approach establishes different regulatory requirements from one air region to the next (U.S. EPA).

Prior to 2003, agricultural operations in California were exempt from the federal Clean Air Act requirements. However, on September 22, 2003, Governor Gray Davis signed into law Senate Bill 700 which imposed new regulations on agricultural operations with respect to air quality. The bill contained six main provisions: 1) It defined "agricultural source" in state law; 2) It removed the restriction on air districts to not require permits for agricultural source air pollution; 3) It established specific permitting and exemption requirements for agriculture; 4) It required emission control regulations in areas that exceed federal air quality standards for PM10 (particulate matter); 5) It required permits and emission mitigation from Confined Animal Facilities (CAFs); 6) It requires CAPCOA (California Agricultural Pollution Control Officers Association) to compile a clearinghouse of information about current emissions control and mitigation activities (California Air Resources Board; Feather River Air Quality Management District).

California is comprised of 35 air districts. Requirements for air quality compliance vary greatly, depending on the pollution levels inherent in a particular region. The lettuce grower in Salinas falls under the jurisdiction of the Monterey Bay Unified Air Pollution Control District, which considers agricultural operations for growing crops or livestock as generally exempt from air quality permits and regulations. Monterey County, on the Central Coast of California, has no non-attainment areas for air quality, and thus does not fall under EPA's Title V regulations for pollution reduction. In 2006, the lettuce grower reported no costs for air quality regulation.

However, in 2006, the California Legislature passed the Global Warming Solutions Act or AB 32 to reduce greenhouse gas emissions to 1990 levels by 2020. While agriculture operations emissions were not capped under this law, air districts introduced new regulations with respect to vehicle and other types of emissions that contribute to greenhouse gas formation. Even "clear air" areas such as Monterey County imposed more stringent regulations. As of May 2007, all agricultural diesel engine equipment, both stationary and mobile, must be registered with the Monterey Bay

Unified Air Pollution Control District, and equipment emissions must be monitored (California Air Resources Board, Monterey). The lettuce grower now has two staff members who each spend 40 hours annually reporting equipment and emissions information to the MBUAPCD. The grower also had two trucks that were found non-complaint with current emissions standards and new emissions filters had to be installed. The cost of the truck filters was $25,000 each; the life span is expected to be six years. The total air quality compliance costs per acre in 2017 was $5.26, the lowest of all regulatory categories.

Water Quality

The United States Clean Water Act is the primary federal statute that mandates states to control water quality. The EPA provides funding for states to administer the required planning and regulatory programs, but states must submit plans to control water pollution that meet the criteria established by federal law. The most difficult type of pollution to control is non-point source pollution, or NPS. According the U.S. EPA, nonpoint source pollution is the largest source of water quality problems in the U.S.

Two California agencies are responsible for developing and carrying out the NPS pollution control policies; the State Water Resources Board (SWRB) and the nine Regional Water Quality Control Boards (RWQCB). The Porter-Cologne Act, initially adopted in 1969, is the state law that provides the authority to the SWRB and the RWQCB to control NPS pollution (Gerstein, et al. 2005). Each regional board develops "basin plans" for their hydrologic areas, governs requirements and issues waste discharge permits, takes enforcement action against violators, and monitors water quality. The California Water Code gives RWQCBs the authority to regulate discharges of waste that could impact the waters of the state of California, through permits called "Waste Discharge Requirements." A discharge is any release of waste, such as fertilizer, pesticide or sediment, to a water of the state. Waters of the state include rivers, streams, lakes, bays and estuaries, and groundwater.

The lettuce producer's operation is in Region 3 which is comprised of Santa Cruz, San Benito, Monterey, San Luis Obispo, and Santa Barbara counties as well as the southern parts of Santa Clara and San Mateo counties, the northern portion of Ventura

County, and small portions of Kern County. Since the 2006 study, the Central Coast Regional Water Quality Control Board adopted much more stringent rules for water quality on irrigated lands; a revised Agricultural Order was introduced in 2012 and updated in 2017, now referred to as the Agricultural Order 3.0. More than 424,000 irrigated acres spread among 4,440 farms were enrolled in the 2012 Agricultural Order (CCRWQCB). Agricultural operations are divided into three tiers based on risk to water quality. Farm size and chemical and fertilizer applications determine the relevant tier.

The lettuce grower falls into Tier 2, which includes all farms/ranches between 50-500 acres of irrigated lands with a nitrogen loading crop, and/or application of certain chemicals. As of March 2017, the following water quality compliance activities are required of all Region 3 Tier 2 operations (California Water Boards – Central Coast R3):

- Submit or update an electronic Notice of Intent (enrollment with the Region 3 Water Board)
- Develop a farm water quality management plan
- Destroy abandoned groundwater wells
- Implement management practices to meet water quality standards and assess their effectiveness
- Minimize bare dirt and prevent erosion
- Maintain existing riparian vegetation
- Conduct surface water monitoring and reporting (either through cooperative agreement or by a qualified third party)
- Conduct groundwater monitoring of each well twice annually and report results (by a qualified third party)
- Submit or update the ranch Annual Compliance Form
- Maintain records for Total Nitrogen Applied, which include:
    - Track nitrogen applied in fertilizers and compost
    - Track volume of irrigation water used on ranch
    - Annually sample irrigation water nitrogen concentration
    - Annually sample soil nitrogen
- Submit a Total Nitrogen Report

Growers that are classified as Tier 3 (over 500 acres of nitrogen-loading crops and/or application of certain chemicals) must comply with all of the Tier 2 requirements and also:

- Conduct and report results of Individual Discharge monitoring
- Implement Certified Irrigation & Nutrient Management Plan
- Submit Certified Irrigation & Nutrient Management Plan Effectiveness report
- Implement Water Quality Buffer Plan and Update (if ranch is adjacent to affected surface water)

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In 2006, the lettuce grower estimated a water quality compliance of $4.30 per acre. Agriculture water quality was covered under a Conditional Waiver program until 2012, and growers were able to implement a range of water quality improvement practices and pay a fee to join a coalition. The farm's primary cost in 2006 was for water monitoring systems; flow meters were installed to report water use. Irrigation water quality testing was done for food safety compliance, not to protect water quality.

In 2017, the grower reported that costs had risen to $18.57 per acre, a 331% increase over the 2006 costs. Most of these costs involved increased monitoring and reporting of both groundwater as well as fertilizer applications to the land. The grower reported paying $13,000 per year to a third-party testing service, and the reporting system for nitrates costs $10,000 per year, plus $5,000 in staff time. An accounts payable staff member spends one day per month reporting fertilizer type and quantity used as part of the Nitrogen Management Plan requirement. In addition, one of the owners tests all of the wells annually, at $130 per test. The grower also reported paying $21,000 as part of a required Salinas Valley agricultural stewardship coalition to provide clean water supplies to communities with polluted drinking water.

The water quality compliance costs will increase in the future as the Sustainable Groundwater Management Act is implemented in 2020. As of January 2018, each high-priority water basin (determined by primarily by overdraft) has formed a Groundwater Sustainability Agency, which is tasked with developing a Groundwater Sustainability Plan (GSP) for the basin, and must meet the sustainability goals within 20 years of implementing the plan (California Department of Water Resources). Growers anticipate additional enforcement as well as higher costs for both water quality and regulations on the quantity of water used. However, as no GSPs are yet in place, any estimation of these costs would be speculative.

Pesticide Use Regulations

The U.S. Environmental Protection Agency regulates pesticides under the auspices provided by two major acts of Congress; the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and the Federal Food, Drug and Cosmetic Act (FFDCA). These were strengthened by the Food Quality Protection Act (FQPA), which became law

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in 1996. States are authorized to regulate pesticides under FIFRA and under state pesticide laws. States may place more restrictive requirements on pesticides than EPA. Both the EPA and the state must register a pesticide before distribution. California pesticides must undergo a more rigorous review than all other states. The Department of Pesticide Regulation, under Cal EPA, administers the certification and licensing process. Owners of private firms who plan to use restricted-use pesticides (as classified by the U.S. EPA) on their own property (defined as property owned/leased or rented by him/her or his/her employer) can apply for a Private Applicator Certificate, which requires the passage of an exam that is administered through the County Agriculture Commissioner's office. To renew the Private Applicator Certificate, six hours of continuing education over the three years of the valid certification is required.

An Agricultural Pest Control Advisor's (PCA) license is required of anyone who advises the use of restricted materials, and a Qualified Applicator's license is required of anyone planning to apply restricted materials for hire. Many large growers in California use PCAs to advise their pest control needs. The requirements for a PCA include 42 semester units of core courses, over and above a B.S. degree or equivalent. The applicant must pass a Laws and Regulations exam, and must acquire 40 hours of DPR-approved continuing education every two years to maintain the license.

Both private applicators and PCAs are required to provide a Notice of Intent to the County Agricultural Commissioner at least 24 hours before the application of restricted materials. Since 1990, when the DPR began its "full-use reporting" program, private applicators and PCAs must report their applications monthly to the County Agricultural Commissioner, who then reports the data to the Department of Pesticide Regulation. The reports must include the data and location where the application was made, the type of crop, as well as the type and amount of pesticides used. The DPR keeps a comprehensive database of pesticide use in California (California Department of Pesticide Regulation).

The lettuce grower said that they contract out their crop protection services to third party providers, and so the cost of pesticide regulation is estimated to be around 5% of their pesticide costs, or $35.55 per acre. Depending on the provider, crop protection firms may bill PCA time separately, in which case it is easier to separate out the

regulatory costs, or the cost of the PCA services (which also includes posting signs, filing notices of intent, filing pesticide application reports, etc.) is included in the price of the chemicals. The grower noted that the ranch must keep spray application records for six years. In 2006, the ranch reported pesticide regulatory costs of $22.98 per acre. The costs of pesticide regulation for this ranch increased by nearly 55% by 2017. However, we note that these costs are likely underreported, as it is difficult without a comparison state (as in the 2006 study) to study the cost differences in pesticides due to increased registration costs in California. If a crop protection service includes their PCA and other regulatory services within the price of the chemicals, it is also difficult to ferret out the regulatory component. Some of the increased regulatory costs of pesticide use are also captured in other areas of this study, such as Education & Training for Regulatory Compliance as well as the Worker Protection Standard that accounts for the costs of safety gear for workers.

Pesticide use regulations will become more onerous starting in 2018 as the California Department of Pesticide Regulation adopted new rules restricting pesticide applications within ¼ mile of schools and daycare centers. Pesticide applications are prohibited Monday through Friday from the hours of 6 a.m. to 6 p.m., and growers must notify schools at the beginning of the year regarding their pesticide application plans, and again 48 hours before the actual application. A UC Davis study estimated the economics effects of this regulation on California's agricultural industry. The study covered 13 top agricultural counties in California – though Monterey County was not included because of data limitations. The notification effort was estimated to cost each affected grower $1,234 (Goodhue, et al. 2016).

Food Safety

When the 2006 study was conducted, it preceded the E. coli outbreak in spinach that occurred later that year. Thus, regulatory compliance for food safety was far less stringent than 2017. In 2006, the grower paid a third-party food safety audit company $3,000 for ranch and harvest crew inspections, and a staff person spent about three hours per month preparing documents for the audits. The total cost per acre for food safety regulatory activities was $.64.

In 2017, food safety regulations were the grower's third highest compliance cost behind workers' compensation and other labor wage regulatory costs. Most of these compliance costs were born out of the Leafy Greens Marketing Agreement (LGMA) of 2007, an industry-developed set of food safety practices for California leafy greens producers and handlers. These were updated to correspond with the federal Food Safety Modernization Act of 2011, which included the Standards for the Growing, Harvesting, Packing, and Holding of Produce for Human Consumption, which went into effect in 2016, commonly known as the Produce Safety Rule. The rule established, for the first time, scientific minimum standards for food safety throughout the entire food supply chain, from production and harvest to packaging, handling and transporting (U.S Food and Drug Administration).

The LGMA has five basic provisions at the farm level, covering the following areas:

- Environment
- Water
- Soil Amendments
- Worker Practices
- Field Operations

Each farm must have a written food safety plan that describes their management practices with respect to these provisions. Environmental risk factors include past flooding, land use near fields, and animal intrusion. Growers must maintain buffer zones between fields and any areas used for livestock, compost or septic leach fields. Fields must be inspected prior to harvest for animal intrusion, either wild or domestic, and staff must document the incident and all or part of the crop might be destroyed. Irrigation water must be tested regularly for E. coli, and must not exceed the maximum allowable level. The grower also must prepare a description of their water system. No soil amendments may contain animal manure, or if they do, the grower must prove they have been heat-treated or composted, and they must be tested for E.coli 0157 H7 and Salmonella (LGMA 2018).

With respect to worker practices, growers must provide toilet facilities and hand washing stations that are regularly cleaned and stocked with supplies. The

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facilities must be accessible from the workers' locations, and workers must participate in on-going training sessions and have signage posted regarding employer rules regarding hand washing and other sanitation issues such as eating and drinking near adjacent fields. Field operations with respect to cross-contamination between other leafy greens fields is another component of the LGMA; growers must have in place a process to clean equipment between fields and identify any sources of contamination. Each production block must have a food safety harvest assessment, documenting cleaning and sanitation procedures, any evidence of animal intrusion, and equipment storage procedures. Farms are subject to both scheduled and unscheduled audits of their food safety practices (LGMA 2018).

In order to comply with these regulations, the grower hired a staff person at a $65,000 salary who spends approximately 40% of his time on food safety issues for the LGMA. Much of this time is spent in documenting the farm's food safety practices. Harvest machinery sanitation requires one full-time worker for each of the three crews during the 32 weeks of the growing season, which costs over $100,000 annually. The foreman of each crew must test all of the workers' equipment and making sure the crew is following sanitation practices, as well as conduct the preharvest inspection and paperwork. This time totals over $50,000 during the season. The toilet facilities must be cleaned every day during the season; the value of employee time is $100 per day per crew. Provision of the toilet facilities themselves costs $150 per week per toilet during the growing season, this totals over $14,000. Third party food safety audits for the lettuce portion of the farm costs nearly $4,000. The combined costs of food safety compliance for this grower was $181.48 per acre – an enormous increase from the $.64/acre cost in 2006.

Workers' Compensation

As with many regulatory costs, workers' compensation is a cost of doing business in California. All employers, even those with only one employee, are required to carry worker's compensation in California. In California, the Division of Workers Compensation monitors and administers workers' compensation claims. California

employers generally have three options to fund their workers' compensation benefits: (1) self-insurance, (2) private insurance, or (3) state insurance.

- Self-Insurance – This option is available for employers with at least $5 million in net worth, net income of $500,000 per year and be certified from the Department of Industrial Relations. Private employers must post security as a condition of receiving a certificate of consent to self-insure.
- Private Insurance -- Employers may purchase insurance from any of the approximately 300 private insurance companies which are licensed by the Department of Insurance to provide workers' compensation insurance in California. Insurance companies are free to price this insurance at a level they deem appropriate for the insurance and services provided.
- State Insurance -- Employers may also purchase insurance from the State Compensation Insurance Fund, a state-operated entity that exists solely to provide workers' compensation insurance on a non-profit basis (California Department of Industrial Relations).

Prior to the 2006 study, the state had undergone workers compensation reform in 2003 and 2004, a result of which reduced premiums for employers. The grower reported his costs for workers' compensation as $58.94 per acre in 2006, 95% of which came from the 10% insurance premium on worker pay. The additional five percent came from clerical staff filing paperwork with the State of California. In 2006, workers' compensation comprised 54% of this grower's total regulatory costs.

California passed additional workers' compensation reforms in 2012; the primary changes were increased benefits to injured workers and new processes for independent bill review, new fee schedule and changes in the calculations of permanent disability benefits, among others. Despite these reforms, workers compensation costs increased dramatically for the grower by 2017.

The grower reported that the workers' compensation premium for field workers, supervisors and foremen is 15% of their wages. He noted that the harvest crews are paid on piece rate, and can earn $18 to $20 per hour. Workers' compensation is calculated on top of the actual earnings, so the grower's total cost of workers compensation premiums came to over $300 per acre. One of the managers spends about half of his time on

workers' compensation issues, adding another $32 per acre. Overall, the grower's reported costs of workers' compensation in 2017 was $336.23 – a nearly five-fold increase from 2006. Both the increased insurance premium as well as the much higher wage rate contributed to this increase. It is also possible that the 2006 study underestimated the workers' compensation costs to some degree – we did not consider the impact of piece rate wages, and thus used the minimum wage at the time, which was $6.75 per hour in 2006.

Affordable Care Act Requirements

Similar to the LGMA, the Affordable Care Act (ACA) of 2010 imposed an entire new set of regulatory costs. The ACA, which went into effect in 2014, requires all employers with 50 or more full time or full-time-equivalent employees to provide health care coverage for their workforce, and file an annual information return to the IRS reporting whether and what type of health insurance is provided to employees. The same information must be provided to the employees annually to provide the IRS on their tax returns.

The grower reported paying $250 per month for the 100 employees that work on the lettuce operation, plus 200 hours of an upper manager's time per year to file required reports to the IRS and employees. ACA coverage and documentation cost $141.19 per acre in 2017.

Labor Health and Safety Requirements

The 2006 study did not contain a category for this area of regulatory compliance. Any worker health and safety regulations were categorized under Workers' Compensation or Education and Training. Heat stress and illness prevention measures were adopted by Cal OSHA in 2006 for those in outdoor occupations, defined as agriculture, construction, oil and gas extraction, landscaping, and the transportation or delivery of agriculture, construction or heavy materials. This was the first law of its kind in the nation, but there was little training or enforcement during this initial period. In the ensuing years, training became mandatory for both supervisors and employees and additional worker protection standards have been developed. In 2015, Cal OSHA

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approved changes to its Heat Illness Standard, effective May 1, 2015. Employers must provide shade structures that are sufficient to cover all employees taking breaks at one time when the temperature is above 80°F. Clean, cool drinking water must be provided free of charge to employees, and both the shade structure and water must be nearby the workers' location. Many growers use portable shade wagons or trailers. Pre-shift heat stress trainings are required to remind workers about drinking sufficient water, taking breaks and the signs of heat stress. During extreme heat conditions, defined as 95°F or above, workers must take a 10-minute rest break to cool down every two hours in an eight-hour shift. Workers must also be able to take at least a five-minute break upon request, even if temperatures are below those thresholds. Farming operations are subject to unannounced inspections by Cal OSHA to check for compliance. Fines are assessed for any violations (California DIR, Heat).

With respect to pesticide safety, the training costs for the 2017 Worker Protection Standard were covered in the Education/Training for Regulatory Compliance category. However, it is the grower's responsibility to provide safety gear to the workers, such as gloves and protective eyewear. Some of these provisions are part of the LGMA food safety protocols as well. The lettuce grower estimates that the costs for the worker supplies comes to about $.03 cents per carton, or $25.50 per acre. Shade trailers for the lettuce operation cost about $1,200 per crew; after depreciating the cost of the trailers over six years this comes to $.56 per acre. Providing sufficient clean, cool drinking water to the crews during the season costs about $5 per crew per day or $2.67 per acre. The total cost per acre for labor health and safety regulations in 2017 was $28.72.

Labor Wage Requirements

This category was part of the 2006 study, but again, costs increased in conjunction with regulatory expansion. In 2006, the grower's labor wage requirements were reported as the time spent in filing employee paperwork and taxes primarily with respect to the workforce – the grower reported 300 hours of staff time needed to file payroll taxes and state employee forms. We calculated this cost as $1.36 per acre. As in many other categories, new regulations greatly expanded this cost by 2017. In 2016, AB 1513 went into effect for employers of piece rate workers. The California Labor Code

was amended to establish separate wage calculations to compensation for rest or other non-productive time so as not to penalize workers for taking rest breaks. Most of this grower's workforce is paid on piece rate, so the foremen must document and payroll staff must calculate the non-productive time. This time is paid at an average hourly rate based on their piece work rate. The grower estimated this regulation cost $.11 per carton in additional staff time for documentation and higher wages for rest breaks. Additionally, SB 3, the Healthy Workplace Healthy Families Act of 2014, requires employers to provide paid sick leave for any employee who works 30 or more days within a year, including part-time and temporary workers. Employees earn at least one hour of paid sick leave for every 30 hours worked (California DIR). The grower estimates that paid sick leave costs $.10 per carton. The total combined cost to the grower for nonproductive time wage increases and sick leave are calculated at $178.50 per acre. The additional staff time needed to file payroll taxes and employee forms was reported at 800 hours per year, or $10.60 per carton, bringing the total cost for this category to $189.10, the second largest regulatory cost category in 2017.

Assessments

Since 2006, the California Lettuce Research Board has been disbanded and a new organization, the California Leafy Greens Research Board, started in 2008, after a referendum by the leafy greens growers and approval by the California Department of Food and Agriculture. The assessment on growers is $.006 per carton. This organization is separate from the Leafy Greens Marketing Agreement, which requires growers to pay .0115 per carton. The total cost per acre for these assessments is $14.88 per acre in 2017. This is the only regulatory category that decreased over the study time period; the 2006 assessments on the grower cost $19.66 per acre.

Summary and Conclusion

The results of this case study indicate that the regulatory environment in California agriculture has changed significantly over the 11-year time frame. Our study shows a 795% increase in regulatory costs, from $109.16 per acre in 2006 to $977.30 per acre in

2017. Total costs for lettuce production have increased by 24.8% in that time frame, from $8,793 per acre in 2006 to $10,977 in 2017.

Most of these changes in regulatory costs are due to new food safety or labor wage, health and safety laws. The most notable increases in regulatory costs are for food safety, as a result of the Leafy Greens Marketing Agreement and the Food Safety Modernization Act; increases in both piece rate wages as well as an increased workers' compensation premium; the Affordable Care Act requiring employer-provided health insurance, and the additional labor wage requirements for provision of sick leave and the higher average wages for piece rate workers for non-productive time. Table 1 summarizes the changes in the regulatory costs from 2006 to 2017.

Table 1. Regulatory Cost Changes for Salinas Valley Lettuce Grower, 2006 to 2017

Regulatory Category	2006	2017
	Cost per acre	
Education/Training for Regulatory Compliance	$1.27	$26.31
Air Quality Requirements	$0.00	$5.26
Water Quality Requirements	$4.30	$18.57
Department of Pesticide Regulation	$22.98	$35.55
Food Safety - LGMA and PR	$0.64	$181.48
Assessments	$19.66	$14.88
Labor Health & Safety Requirements	$0.00	$28.72
Worker's Compensation	$58.94	$336.23
ACA Requirements	$0.00	$141.19
Labor Wage Requirements	$1.36	$189.10
Totals (per acre)	**$109.16**	**$977.30**

Figures 1 and 2 on the following page depict the percentage breakdown for each regulatory category by year. Though workers' compensation remains the most expensive regulatory category in 2017 and has dramatically increased since 2006, its relative cost has diminished as other regulatory costs, notably labor wage requirements, food safety, and health insurance, have increased.

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Figure 1. 2006 Regulatory Category Comparison

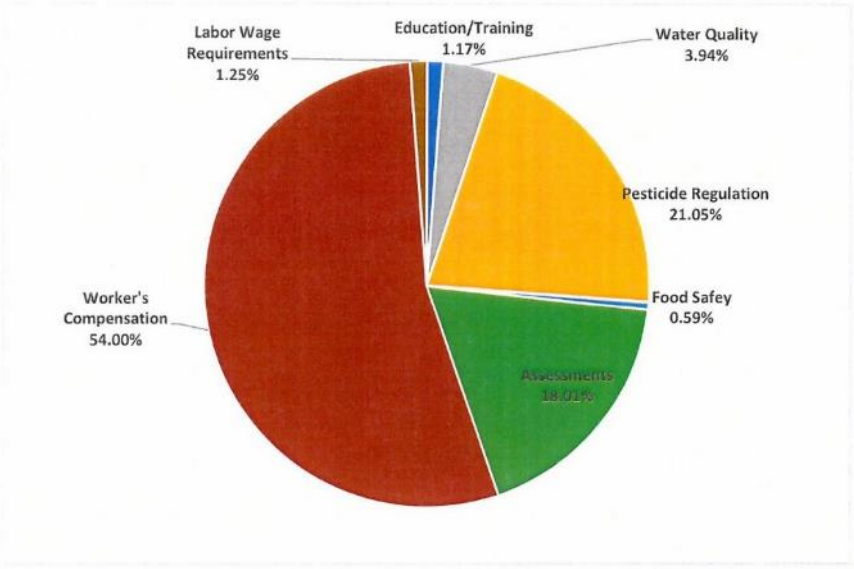
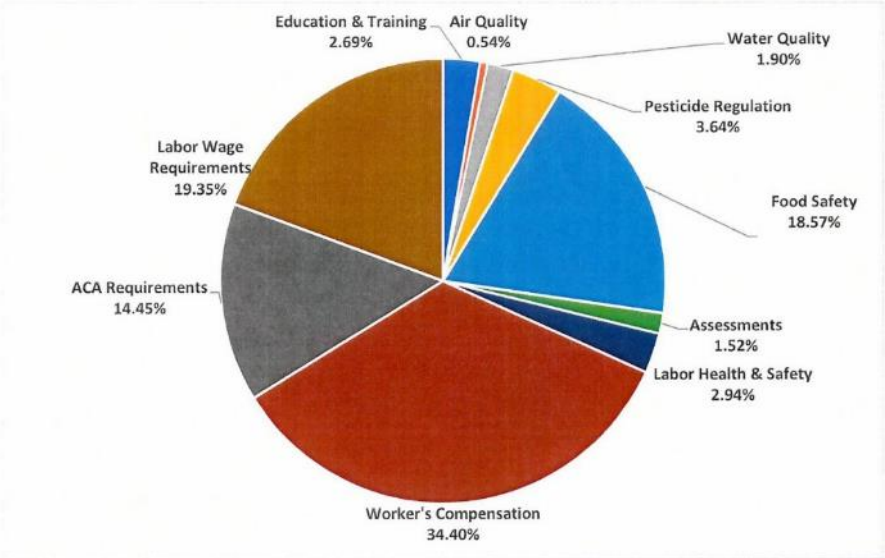


Figure 2. 2017 Regulatory Category Comparison



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The impact of California's minimum wage laws passed in 2016 were not directly included as a regulatory cost in this study, though the impacts are embedded. California's minimum wage was $6.75 per hour in 2006, and increased to $10.50 in 2017 for businesses with 26 or more employees. (Interim increases went into effect in 2007, raising the minimum wage to $10 by 2016). However, the fresh produce industry, which increasingly relies on the federal H2A program for workers to shore up a domestic agricultural labor shortage, has an adverse effective wage of $13.18 in California, thus becoming the effective minimum wage for industries reliant upon this program (U.S. Department of Labor). Additionally, the harvest workers are paid piece rate wages (with a guarantee of at least minimum wage), and the grower reported that his lettuce workforce earned between $18 - $20 per hour. Thus, the effect of higher California minimum wage laws is not factored into this particular case study, though we recognize that the minimum wage will impact regulatory costs in the future as it rises to $15 per hour by 2022. The same comment is relevant to California's agricultural overtime law passed in 2016, which will require agricultural overtime to be paid after 40 hours per week, rather than the current 60-hour agricultural workweek. The phase-in begins in 2019 when overtime must be paid for over 55 hours per week; final implementation occurs in 2022. This law will also increase regulatory costs for growers in the future, but the estimation goes beyond the scope and timeframe for this study.

Similarly, the Sustainable Groundwater Management Act, passed in 2014, will not be fully implemented until 2022 when each Groundwater Sustainability Authority starts requiring compliance with its Groundwater Sustainability Plan. Though economists and others are studying SGMA's potential effects on the agricultural industry, we are not able to estimate its future impact on this grower; it also is beyond this study's scope.

Policy Implications

The purpose of the initial case study conducted in 2006 was to compare regulatory costs between California, Arizona and Texas and to quantify, at the grower level, the cumulative effect of regulation. We know of no prior studies that document the total effect of environmental and employee regulations at the farm level, though subsequent work has been conducted by the authors as well as other researchers. Though

there are certainly limitations to the case-study method that make it difficult to extrapolate these results industry-wide, this study provides a snapshot of the regulatory burden faced by a large grower of one of California's top agricultural commodities over a time period characterized by a wave of new regulations. The policy structure is fragmented among a large number of government agencies, at regional, state and federal levels, and it is rare that a government agency understands the total regulatory burden growers face, or the impacts of increasing regulations. The 2006 study noted:

> *"It is hoped that policymakers can use this study to better understand the impact of adding further regulatory burden to California agriculture, particularly since in all areas documented by this study, California already leads the comparison states in terms of the number of regulations and the cost of compliance"* (Hamilton 2006, p. 71)

Clearly, this report shows the regulatory burden has dramatically increased, and most of the additional regulations since 2006 (the largest exception being the Affordable Care Act) were enacted at the state level. Amid the backdrop of existing environmental and economic stresses caused by the ongoing drought, climate change, labor shortages, and uncertainty in trade policy, Johnson and McCalla's 2004 question, "Wither California Agriculture: Up, Down or Out…." seems less likely to be a positive answer. Anecdotal evidence from growers as well as other case studies indicate that other states are not necessarily California's biggest competition, but other countries. Large specialty crop producers such as Driscoll's and Mission Avocado have expanded their operations into Central and South America where land, labor, water and regulatory costs are all much less expensive. Such a trend could permanently change California's dominant position in U.S. agriculture.

Policy makers may also consider what types of incentive-based or cost-share measures might be implemented to assist California growers with meeting the costs of regulatory compliance. As an example, the California Air Resources Board operates the Carl Moyer program which provides millions of dollars of funding annually to help farm owners upgrade both mobile and non-mobile agricultural equipment to meet more stringent emissions standards. For the most part, growers are expected to absorb the increased costs of regulation or face penalties for violations. The market structure of most

agricultural production at the farm level does not allow growers to pass on the increased costs of regulation up through the supply chain.

While it is difficult to establish a direct cause and effect, the lettuce industry has experienced a shift in production in California. Overall, the number of harvested acres has remained steady, even slightly increased since 2006. However, as shown in Table 2, that production has shifted both away from Monterey County, known as the "salad bowl of the world" and from head lettuce. A fully detailed explanation for this shift goes beyond the scope of the study; factors such as consumer preferences, competition for land with higher value crops such as berries are likely factors. But head lettuce is far more labor intensive than lettuce greens that comprise bagged salads – those crops are mechanically harvested – and the increased regulatory costs for labor, as well as an acute agricultural labor shortage, likely contribute part of the story of the changing production patterns.

Table 2. California and Monterey County Harvested Lettuce Acreage, 2006, 2016

Year	California (acres)		Monterey County (acres)	
	All Lettuce	**Head Lettuce**	**All Lettuce**	**Head Lettuce**
2006	207,000	125,000	169,000	66,007
2016/17	209,100	89,500	106,863	40,476

Source: CDFA and Monterey County Crop Reports, 2006 and 2017.

This case study indicates that California agricultural producers face increasingly intensifying regulatory pressure, and as noted in this study, further regulations are yet to be implemented that may have serious implications for two necessary resources that are already in short supply – groundwater and farm labor. While California agriculture has thus far shown resilience as regulations have escalated, the results of this study provide evidence that the regulatory burden has far surpassed production cost increases. Whether California agriculture continues to be a dominant force in the U.S. food system may at least in part depend on growers' abilities to withstand the increasingly expensive regulatory environment in the Golden State.

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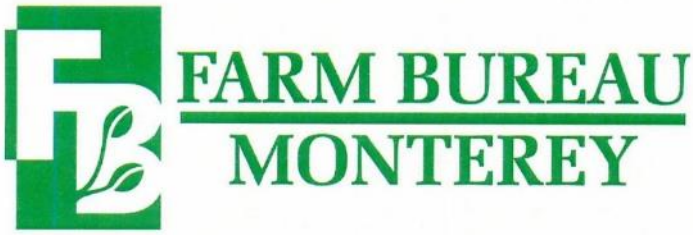
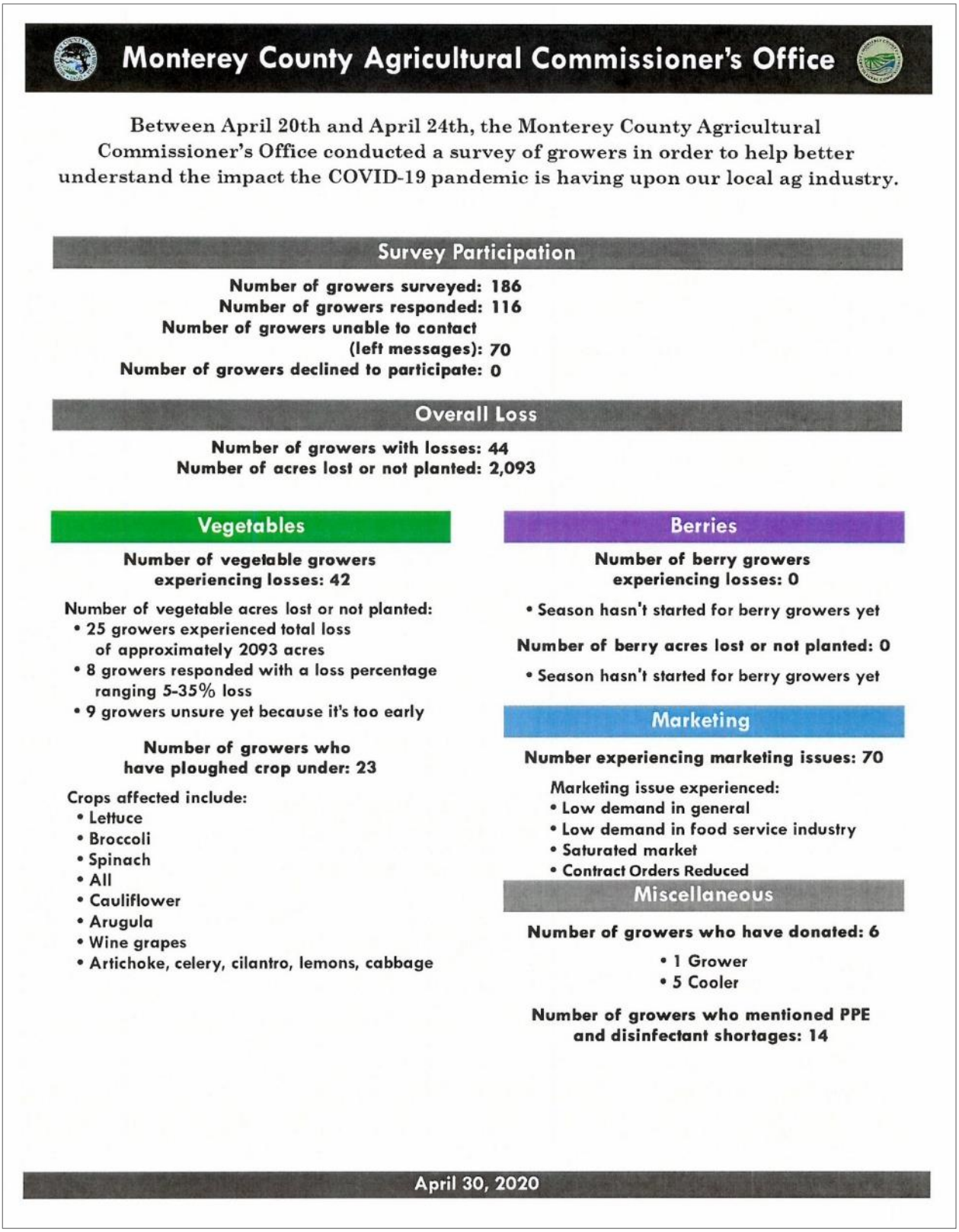


Irrigated Lands Regulatory Program

"Ag Order 4.0"

Comment Letter

ATTACHMENT B



Monterey County Agricultural Commissioner's Office

Between April 20th and April 24th, the Monterey County Agricultural Commissioner's Office conducted a survey of growers in order to help better understand the impact the COVID-19 pandemic is having upon our local ag industry.

Survey Participation

Number of growers surveyed: 186
Number of growers responded: 116
Number of growers unable to contact (left messages): 70
Number of growers declined to participate: 0

Overall Loss

Number of growers with losses: 44
Number of acres lost or not planted: 2,093

Vegetables

Number of vegetable growers experiencing losses: 42

Number of vegetable acres lost or not planted:
- 25 growers experienced total loss of approximately 2093 acres
- 8 growers responded with a loss percentage ranging 5-35% loss
- 9 growers unsure yet because it's too early

Number of growers who have ploughed crop under: 23

Crops affected include:
- Lettuce
- Broccoli
- Spinach
- All
- Cauliflower
- Arugula
- Wine grapes
- Artichoke, celery, cilantro, lemons, cabbage

Berries

Number of berry growers experiencing losses: 0

- Season hasn't started for berry growers yet

Number of berry acres lost or not planted: 0

- Season hasn't started for berry growers yet

Marketing

Number experiencing marketing issues: 70

Marketing issue experienced:
- Low demand in general
- Low demand in food service industry
- Saturated market
- Contract Orders Reduced

Miscellaneous

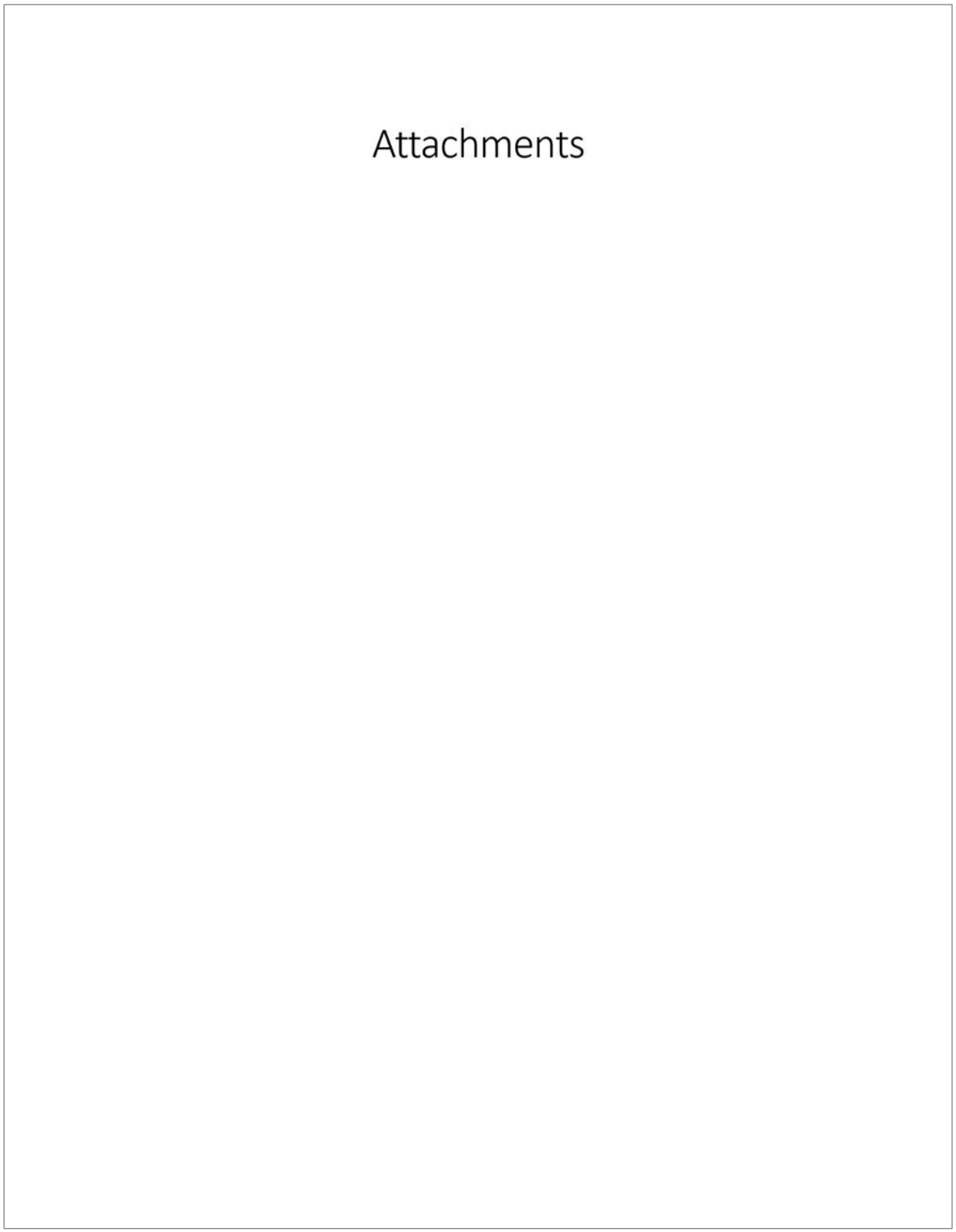
Number of growers who have donated: 6

- 1 Grower
- 5 Cooler

Number of growers who mentioned PPE and disinfectant shortages: 14

April 30, 2020

Attachments to Letter AU: Ramy Colfer and Michael E. Menes, True Organic Products (June 19, 2020)



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Attachment 1

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Journal of Environmental Quality

TECHNICAL REPORTS

Waste Management

Nitrogen mineralization from organic amendments is variable but predictable

Patricia Lazicki[1] | **Daniel Geisseler**[1] | **Margaret Lloyd**[2]

[1]Dep. of Land, Air and Water Resources, Univ. of California, Davis, One Shields Ave., Davis, CA 95616, USA

[2]Univ. of California Cooperative Extension, Capitol Corridor, 70 Cottonwood St., Woodland, CA 95695, USA

Correspondence
Patricia Lazicki, Dep. of Land, Air and Water Resources, Univ. of California, Davis, One Shields Ave., Davis, CA 95616, USA.
Email: palazicki@ucdavis.edu

Assigned to Associate Editor Mussie Habteselassie.

Abstract

To manage nitrogen (N) efficiently, organic growers must be able to predict the amount and timing of plant-available N from organic amendments. In this study, we measured N mineralization from a variety of organic amendments, including composted animal manures and plant material, pelleted and granular organic fertilizer formulations, slaughter waste products, and hydrolyzed liquid fertilizers. In a laboratory incubation, we measured net N mineralization from materials mixed with either organically or conventionally managed soil at 23°C and 60% water holding capacity after 0, 7, 21, 42, and 84 d. We found that net mineral N change in the amended soils after 84 d of incubation fell into four categories: immobilization to 5% of applied N for yard trimmings composts, 15–30% for poultry manure composts, 35–55% for granular fertilizers, and 60–90% for quick release products. However, across all amendments the amount of plant-available N after 84 d of incubation was well correlated with the carbon (C)/N ratio ($R^2 = 0.92$). Within amendment types, the C/N ratio predicted N mineralization for yard trimmings composts ($R^2 = 0.91$), manure composts ($R^2 = 0.81$), and specialty fertilizer and slaughter products ($R^2 = 0.88$) but not liquid products ($R^2 = 0.11$). Soil management history did not consistently affect net N mineralization but may have influenced timing.

1 | INTRODUCTION

Due to concerns about nitrate (NO_3) leaching into the groundwater, California growers are under increasing legislative pressure to match their N applications with crop demand. Among those are certified organic growers, who occupy over 400,000 ha of California farmland (USDA–NASS, 2017). Synchronizing timing of plant-available N with crop demand is especially challenging for organic growers, who use a wide variety of fertility sources from which N must be mineralized before it is plant available. These sources range from composted municipal yard trimmings to patented pelleted and liquid fertilizer formulations. Observing the "4Rs" of efficient nutrient management (right rate, right time, right type, and right placement) and managing irrigation practices appropriately for such a range of different materials requires good information about (i) how much of the amendment N is likely to become available to the current crop, (ii) the predicted timing of N mineralization, and (iii) how environmental and management factors affect amendment N mineralization dynamics. New formulations are continually developed; in particular, specialized pelleted and granular

Abbreviations: CONV, conventional; Food, unshaken food hydrolysate; FoodS, shaken food hydrolysate; GF, granular fertilizer; GF4%, granular fertilizer with 4% N; $N_{min}84$, plant-available N after 84 d of incubation; ORG, organic; PMC, poultry manure compost; SOC, soil organic carbon; WHC, water holding capacity; YTC, yard trimmings compost.

blends are increasingly popular. Little research has been done on these materials, in which many different types of organic materials are combined and processed according to proprietary recipes. In addition, compost properties vary depending on the composting process, which differs among facilities, and the feedstock quality and pile age, which may differ from batch to batch within a facility. Therefore, it would be useful to identify classes of materials that behave in similar ways or easily measurable characteristics that can predict an amendment's N mineralization behavior.

Results from prior studies show that N mineralization dynamics are complex and can be highly variable. A first-order kinetics model is often used to describe decomposition and N mineralization from composted amendments (Bernal, Navarro, Sánchez-Monedero, Roig, & Cegarra, 1998a; Hadas & Portnoy, 1994; Hadas, Kautsky, & Portnoy, 1996) or from both fresh and composted amendments (Agehara & Warncke, 2005; Gale et al., 2006). Other researchers have found that the decomposition of incompletely composted or heterogeneous amendments follows a two-pool model (e.g., linear mineralization during initial decomposition of the easily available material but first-order kinetics thereafter) (Bernal et al., 1998a). In addition, potentially mineralizable N from an amendment class can differ by an order of magnitude. For example, poultry manure compost studies from around the United States report that organic N mineralization plateaued at anywhere from 5% (Hartz, Mitchell, & Giannini, 2000; Preusch, Adler, Sikora, & Tworkoski, 2002) to over 40% of the applied N (Gale et al., 2006; Whitmore, 2007).

It is also uncertain whether the mineralization dynamics of an amendment applied to land transitioning to organic management will be the same as it would be applied to land under long-term organic management, where years of organic matter additions have built up a different microbial community (Fauci & Dick, 1994). Some studies found that net N mineralization from different amendments was unaffected by management history (Hadas et al., 1996; Sanchez, Willson, Kizilkaya, Parker, & Harwood, 2001) and concluded that N mineralization can be considered an intrinsic amendment property. Conversely, other studies have found that amendment N mineralization was significantly dampened where labile soil organic C (SOC) was high (Mallory & Griffin, 2007; Tyson & Cabrera, 1993). This dampening is attributed to immobilization by the larger and more active microbial community fostered by increased substrate in high-SOC soils (Mallory & Griffin, 2007). Several studies have examined whether simple biochemical properties can predict potential amendment N mineralization. The C/N ratio is one of the most commonly recommended properties, having been found by multiple studies to closely relate to N mineralization from a wide range of organic amendments (Delin, Stenberg, Nyberg, & Brohede, 2012; Gale et al., 2006). However, the quality of the C and the initial ammonium (NH_4) concentration can also be predictive, especially for noncomposted amendments, because a high concentration of labile C can stimulate microbial biomass growth and immobilization, and a high NH_4 concentration can indicate a less-decomposed material (Agehara & Warncke, 2005; Bernal, Paredes, Sánchez-Monedero, & Cegarra, 1998b; Burger & Venterea, 2008; Calderón, McCarty, & Reeves, 2005). Other measurements found to be correlated with potential N mineralization or immobilization include total N (Hartz et al., 2000) and short-term CO_2 release (Castellanos & Pratt, 1981).

Core Ideas

- N availability from organic amendments ranged from immobilization to 90%.
- N mineralization from amendments was similar between conventionally and organically managed soils.
- The amendment C/N ratio predicted potential plant-available N well.

The objectives of this study were (i) to determine potential net N mineralization amounts and timing for a wide range of amendments commonly used on California organic farms, (ii) to examine whether amount and timing of N mineralization differ between two soils with conventional and organic management histories, and (iii) to identify amendment biochemical characteristics that could be used to predict the behavior of amendments.

2 | MATERIALS AND METHODS

In 2017 and 2018, a set of controlled 84-d incubations were performed to determine the N mineralization potential of a range of organic amendments in two soils with different management histories. Both soils were mapped as Yolo silt loam (fine-silty, mixed, superactive, nonacid, thermic Mollic Xerofluvents). The CONV site (38°32′ N, 121°47′ W) was a conventionally managed research field near the University of California, Davis; the ORG site (38°53′ N, 122°14′ W) was a commercial field that had been organically managed for over 10 yr. Conventionally and organically managed soils were chosen to determine whether materials would behave similarly on newly transitioning land as on long-term organic land.

2.1 | Amendment analyses

A total of 22 amendments used by local organic vegetable growers were selected. All materials were approved for use in organic production by the Organic Materials Review

Institute. The amendments included yard trimmings–based and manure-based composts, a vermicompost, several commercial granular or pelleted products formulated with manures and slaughter wastes, slaughter products (blood and feather meal), a liquid fish emulsion designed for fertigation, and a hydrolyzed food waste liquid (Table 1). Because liquid organic fertilizers have components that settle out, the food-based liquid was incubated both with and without agitation to suspend particles immediately prior to decanting. Compost types included yard trimmings compost (YTC), poultry manure compost (PMC), and compost made from poultry and plant waste (PMC/YTC). The YTCs and PMCs were each obtained from manufacturers in different counties: Yolo and Solano for YTCs and Sutter and Merced for PMCs. From the Yolo YTC facility, samples from five batches were collected during 2017 and 2018 and incubated separately. From the Sutter PMC facility, samples collected from three batches were incubated separately. Fresh amendments were stored at 4°C in sealed bags until use.

Moisture content was determined by freeze-drying the liquid amendments and drying the solid amendments at 105°C until weights were stable. Total C and N were analyzed by dry combustion of finely ground samples on a Costech Elemental Analyzer (Costech Analytical) according to Nelson and Sommers (1996). To prevent N loss by ammonia (NH_3) volatilization, materials with a high initial NH_4 concentration were ground and analyzed at ambient moisture when possible or acidified with 3 M HCl and dried at 60°C (Derikx, Willers, & ten Have, 1994). Amendment C and N concentrations are hereafter reported on a dry-weight basis for all solid amendments and on a fresh-weight basis for liquids (Table 1).

2.2 | Soil collection and analyses

Amendments were incubated in three separate batches in spring and fall of 2017 and in fall of 2018. Shortly before each incubation, soils were obtained from the top 15 cm of the CONV and ORG sites. Spring samples were taken before planting but after cover crop incorporation in the ORG site and after spring tillage at the CONV site. Fall samples were taken just after the final hand harvest, while the tomato plants were still standing, in fall 2017 at both sites and in fall 2018 at the CONV site. In fall 2018 at the ORG site, soil was sampled after wheat grain had been harvested and the straw removed. Fresh soils were kept at 4°C until use, which was within 8 wk of collection. Although some mineralization occurred during storage, the inclusion of one test amendment (granular fertilizer [GF]4%) with every incubation ensured that different storage times did not affect the net mineralization from amendments.

Baseline soil properties were measured in spring 2017 on soils collected from the plow layer (top 30 cm) as part of a general site characterization at both the ORG and CONV sites (Table 2). Soils were analyzed for moisture by drying in an oven at 105°C for 24 h and for electrical conductivity and pH in a 2:1 deionized water–soil slurry (Smith & Doran, 1996).

Soil organic C, texture, and water holding capacity (WHC) were analyzed using dry combustion (Nelson & Sommers, 1996), the pipette method (Gee & Bauder, 1996), and the funnel method (Wade, Horwath, & Burger, 2016), respectively. To obtain initial mineral N concentrations of the soil and amendments, fresh ORG or CONV soil (sieved < 8 mm) equivalent to 100 g of oven-dry soil was mixed with the equivalent of 336 kg total N ha^{-1} (172 mg N kg^{-1} dry soil) of each amendment. This rate was chosen as the minimum at which all amendments could be uniformly mixed with the soil without pulverization. This is higher than a normal field application rate for most amendments, and at such a high rate some N may be lost by volatilization as NH_3 from the high N amendments. However, the loss is not likely to be substantial: Martin and Chapman (1951) found that 3% or less of the added N was volatilized from 500 mg N kg^{-1} as dried blood mixed with a Yolo sandy loam soil and incubated under similar moisture, temperature, and pH conditions. Additionally, Gale et al. (2006) observed a 1:1 correlation between mineralization potentials from amendments incorporated at rates up to 500 mg N kg^{-1} in a laboratory incubation and the same amendments incorporated at lower rates in the field.

Pieces of undecomposed plant matter in the composts weighing more than 10% of the total amount added were excluded. An unamended control was also included. Two 12-g subsamples were immediately extracted for NH_4–N and NO_3–N analysis as described by Geisseler, Horwath, and Doane (2009).

2.3 | Amendment incubations

Net amendment N mineralization was determined in three incubations, each of which was organized as a randomized complete block design with four replicates. One amendment, a granular fertilizer with 4% N (GF4%), was used in all incubations to ensure comparability. This amendment was reanalyzed immediately prior to each use to ensure no N loss had occurred during storage.

Fresh soil equivalent to 300 g of oven-dry ORG or CONV soil was sieved to 8 mm and thoroughly mixed with an equivalent of 336 kg N ha^{-1} of each amendment by shaking in a large polyethylene bag. Unamended controls were similarly shaken. Pelleted and granular amendments were lightly crushed if necessary for adequate mixing. Soils were transferred to 473-mL plastic cups and packed to a bulk density of 1.3 g cm^{-3}, and moisture was uniformly adjusted

TABLE 1 Properties of amendments incubated in spring 2017, fall 2017, and fall 2018

Category	Amendment description	ID[a]	Incubation date	Moisture	Total N†	C/N ratio	$N_{min}0^b$
				%	%		% of total N
Plant-based composts	yard trimmings compost, Yolo (batch 1; mixed with gypsum)	YTC-Y1	spring 2017	59.05	0.72	20.80	0.20
	yard trimmings compost, Yolo (batch 2)	YTC-Y2	spring 2017	69.29	1.35	18.42	0.45
	yard trimmings compost, Yolo (batch 3; larger chunks)	YTC-Y3	spring 2017	71.11	1.44	20.14	0.09
	yard trimmings compost, Yolo (batch 4)	YTC-Y4	spring 2017	57.88	0.89	19.61	0.61
	yard trimmings compost, Yolo (batch 5)	YTC-Y5	fall 2018	44.64	1.78	13.64	1.27
	yard trimmings compost, Solano	YTC-S	fall 2017	49.49	1.46	13.22	2.32
Manure-based composts	yard trimmings/poultry manure compost blend	YTC/PMC	fall 2018	60.07	2.64	12.05	9.91
	vermicompost (on cattle manure composted with rice hulls)	Verm	fall 2017	126.80	2.61	13.17	17.77
	poultry manure compost, Sutter (Apr. 2017 batch)	PMC-S1	spring 2017	46.24	5.27	7.87	15.90
	poultry manure compost, Sutter (Oct. 2017 batch)	PMC-S2	fall 2017	33.84	3.72	6.84	14.77
	poultry manure compost, Sutter (Apr. 2018 batch)	PMC-S3	fall 2018	41.11	4.69	7.52	16.24
	poultry manure compost, Merced	PMC-M	fall 2017	43.19	4.27	6.68	25.11
Pelleted/granular fertilizers	granular fertilizer, 2% N (poultry manure based)	GF2%	fall 2017	9.36	3.13	6.33	16.84
	granular fertilizer, 4% N (poultry manure and fish based)	GF4%	all	17.14	4.55	6.54	22.75
	pelleted fertilizer, 4% N (poultry manure, bone meal based)	PF4%	spring 2017	11.27	4.27	7.34	9.31
	pelleted fertilizer, 6% N (poultry manure, feather meal based)	PF6%	spring 2017	10.33	7.13	5.16	3.71
	pelleted seabird guano	guano	spring 2017	11.14	12.53	1.15	55.06
Slaughter products	blood meal	blood	fall 018	9.61	13.83	3.51	0.45
	feather meal	feather	fall 2017	7.75	15.64	3.83	0.79
Liquid products	food-based liquid fertilizer, poorly shaken	food	fall 2017	60.34	2.78	5.16	12.76
	food-based liquid fertilizer, well shaken	foods	fall 2018	60.34	3.13	4.58	11.64
	liquid fish emulsion	fish	fall 2017	68.69	2.03	5.19	14.49

[a]Amendment N concentration expressed on a dry weight basis for the solid amendments and on a fresh weight basis for liquid products.
[b]Proportion of the amendment total N initially present in mineral form.

TABLE 2 Initial properties of conventional (CONV) and organic (ORG) soils. Soils were collected from the top 30 cm prior to planting in spring of 2017

Properties [a]	CONV	ORG
Location	Davis, CA	Guinda, CA
Soil series	Yolo silt loam	Yolo silt loam
Rotation (summer 2016–2018)	barley/tomatoes/sweet corn; fallow over winter; conventional fertilizers	melons/tomatoes/wheat; oat-legume cover crop over winter; history of spring compost addition (withheld spring 2017)
Sand, %	21	53
Clay, %	32	19
EC (2:1 water slurry), mS m^{-1}	8.41 (0.29) [b]	18.66 (0.37)
pH (2:1 water slurry)	7.75 (0.02)	7.08 (0.01)
WHC, g g^{-1} dry soil	0.41 (0.006)	0.39 (0.005)
SOC, %	0.88 (0.006)	1.21 (0.035)
Total N, %	0.10 (0.01)	0.11 (0.002)
C/N ratio	8.94 (0.04)	10.86 (0.12)

[a]EC, electrical conductivity; SOC, soil organic carbon; WHC, water-holding capacity.
[b]Numbers in parentheses are SEM ($n = 3$).

to 60% WHC (0.23–0.25 g H_2O g oven-dry $soil^{-1}$) with deionized water using a syringe with a side-port needle. Soils receiving the liquid amendments were mixed and packed as described above and uniformly injected with the equivalent of 336 kg N ha^{-1} of amendment diluted in the water used to adjust the moisture. Cups were covered with perforated plastic film and kept in loosely covered bins at 23°C. The moisture content was chosen to provide optimum conditions for microbial activity, and the soil temperature is typical for summer-grown irrigated vegetable crops in Yolo County. Incubation studies performed at similar moisture and temperatures, although not necessarily representative of field conditions, have been generally found to be good proxies for mineral fertilizer equivalent in the field or greenhouse (Delin et al., 2012; Gale et al., 2006; Hartz et al., 2000; Spargo, Cavigelli, Mirsky, Meisinger, & Ackroyd, 2016).

Samples were periodically aerated by fanning, and moisture was maintained between 50 and 60% WHC. Cups were destructively harvested after 7, 21, 42, and 84 d of incubation, and subsamples were extracted for NH_4–N and NO_3–N analysis as described above.

2.4 | Modeling and statistical analysis

For each amendment, the following parameters were calculated. The proportion of the total added N (N_{tot}) initially in mineral form ($N_{min}0$) was calculated as

$$N_{min}0 = \frac{(NH_4\text{-N} + NO_3\text{-N})_{amended} - (NH_4\text{-N} + NO_3\text{-N})_{control}}{N_{tot}} \quad (1)$$

for amended and unamended control samples extracted directly after mixing. The proportion N_{tot} in mineral form at time t (in days) was calculated as

$$N_{min}t = \frac{(NH_4\text{-N} + NO_3\text{-N})_{amended} - (NH_4\text{-N} + NO_3\text{-N})_{control}}{N_{tot}} \quad (2)$$

The proportion of organic N ($N_{org}t$) mineralized with each amendment at time t was calculated as

$$N_{min}t - N_{min}0$$

The $N_{min}t$ values for each time t were compared using PROC MIXED in SAS (SAS Institute) such that each incubation date (spring 2017, fall 2017, and fall 2018) was analyzed as a separate randomized complete block design experiment with replicates as blocks. Means separation was performed with Tukey's test using an alpha of 0.05. Blocks were treated as random effects; treatment and soil type were fixed effects. One amendment, GF4%, was incubated at each date to ensure conditions were comparable. Incubation dates were compared by testing the GF4% date and date × soil interactions for the amount of plant-available N after 84 d of incubation ($N_{min}84$) using PROC MIXED in SAS.

Potential net N mineralization of the added organic N (N_0) and rate constant (k) were also calculated for each amendment as described in the Supplemental Materials.

3 | RESULTS AND DISCUSSION

None of the parameters tested for GF4% differed significantly ($p > 0.10$) among incubation dates for either soil type. Therefore, results were considered to be comparable for amendments incubated in different batches.

3.1 | Rate and timing of amendment nitrogen availability

The results demonstrate the wide range of N mineralization dynamics and potential crop availability from different amendment types used by California organic growers (Figure 1). Because overall mineralization patterns were very similar between the ORG and CONV soils, amendment curves in Figure 1 represent average values. Full data are given in Supplemental Table S1. The tested amendments fell generally into four classes: Class a, YTCs from which < 5% of N was in mineral form after 84 d of incubation; Class b, manure composts from which $N_{min}84$ = 15–30% of applied N; Class c, granular fertilizers from which $N_{min}84$ = 35–55%, most of which was already in mineral form within a few weeks of application; and Class d, quick-release liquids, slaughter products, and guano, from which $N_{min}84$ = 60–90%. The PMC/YTC compost and vermicompost fell intermediate of Class a and Class b.

Mineralization patterns followed three shapes (Figure 1). In the first pattern, which was observed for the vermicompost and most of the YTCs, mineral N remained fairly stable over 84 d (Figure 1a and 1b). The YTCs all started with low N concentrations and over the 84 d either immobilized N or mineralized < 5% of their total N. Similarly, Hartz et al. (2000) studied several California municipal yard waste composts and found that between −1.9 and 5.4% of the total N was available after 84 d of incubation at 25°C. The YTCs tested are therefore a negligible source of plant-available N during the growing season in which they are applied. At the measured N concentrations, a YTC application of 22 Mg ha^{-1} would add 100–200 kg N ha^{-1} to the soil. Even at the highest measured mineralization rate, only about 5–10 kg N ha^{-1} of that would be expected to be mineralized in warm and moist soil over a 3-mo period. However, over time their application may contribute to long-term soil fertility. In a 7-yr experiment with different green waste composts, Sullivan et al. (2003) found that in the first year after a large application (155 Mg ha^{-1}), composts either reduced or had no effect on grass yield compared with a no-compost control. Over the following 6 yr, however, grass yield, N uptake, and soil mineral N were increased in the amended plots.

Similar to the YTCs, vermicompost mineral N was relatively stable over the 84 d. However, unlike the YTCs, the vermicompost started with the relatively high $N_{min}0$ of 17.8%,

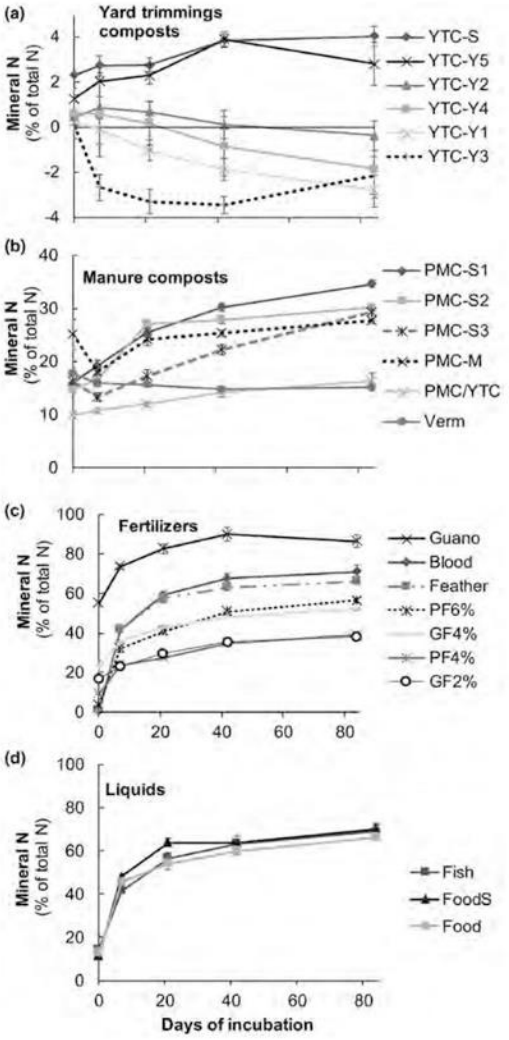

FIGURE 1 Changes in soil mineral N concentrations associated with organic amendments incubated at 23°C for 84 d, with reference to unamended control soils. Values are averages of amendments incubated in conventional (CONV) and organic (ORG) soils. (a) Yard trimmings compost. YTC-Y and YTC-S, yard trimmings compost from Yolo and Solano facilities, respectively. (b) Manure composts. PMC-S and PMC-M, poultry manure composts from Sutter and Merced facilities, respectively; PMC/YTC, blend of poultry and yard wastes; Verm, vermicompost. (c) Fertilizers. Blood and Feather, blood and feather meal, respectively; GF, granular fertilizer; PF, pelleted fertilizer. (d) Liquids. Fish, fish emulsion; FoodS and Food, shaken and unshaken food hydrolysate, respectively. Bars represent SEM ($n = 4$)

and, unlike all the other tested amendments, the majority of this was in the form of NO_3–N. A low ratio of NH_4–N to NO_3–N is generally considered an indicator of compost stability (Bernal et al., 1998b). The lack of further N mineralization during the incubation also suggests a very stable product. Flavel and Murphy (2006) also report vermicompost to be highly stable.

In the second pattern, which included PMC from the Merced facility (PMC-M), the third PMC batch from the Sutter facility (PMC-S3), and the third YTC batch from the Yolo facility (YTC-Y3), N was initially immobilized and then slowly increased (Figure 1a and 1b). The pattern of quick net immobilization followed by gradual net mineralization is characteristic of non- or incompletely composted complex organic substrates (Bernal et al., 1998a; CCQC, 2001). These materials still contain relatively undecomposed and labile C that stimulates soil microbes to immobilize N, which is then slowly re-mineralized as the microbial biomass turns over (Bernal et al., 1998a; Burger & Venterea, 2008; Calderón et al., 2005). For YTC-Y3, which had negligible $N_{min}0$, this immobilization caused mineral N to be well below the control ($N_{min}t < 0$) throughout the incubation (Figure 1a). Our results show that PMC from the Merced facility and PMC-S3 had the highest initial NH_4–N concentrations and NH_4/NO_3 ratios and were the only two PMCs to follow this pattern. They also had less additional N mineralization over 84 d compared with PMC-S1 and PMC-S2. Although microbial biomass was not measured, this result is in line with Calderón et al. (2005), who found that the initial NH_4 concentration in manure was positively correlated with microbial N immobilization. Another possible explanation for the decline is volatilization as NH_3, which can occur under high NH_4 concentrations at a high pH (Hadas, Bar-Yosef, Davidov, & Sofer, 1983). However, this is unlikely to have been the major cause because similar declines were observed for both the alkaline CONV soil and the neutral ORG soil (Supplemental Table S1).

In the third pattern, N mineralization followed first-order kinetics. This pattern was observed for pelleted/granular, slaughter, and liquid products as well as PMC-S1, PMC-S2, and to some extent PMC/YTC. In these amendments, N was rapidly mineralized during the first few weeks. Mineralization slowed between 21 and 42 d and tended to plateau thereafter. Within this broad pattern, the $N_{min}0$ and the proportion of N mineralized varied widely for different materials. Average $N_{min}84$ from amendments following first-order kinetics ranged from 38 to 87% of added N, with higher proportions mineralized from low C/N ratio amendments (see below). Average guano $N_{min}0$ was 55%. The guano $N_{min}0$ in this study was high compared with values observed by other studies, which range from 5 to about 20% (Hadas & Rosenberg, 1992; Hartz & Johnstone, 2006; Manojlović, Čabilovski, & Bavec, 2010); however, the potential plant-available N in those studies was similar to observed $N_{min}84$ values. In contrast, the slaughter products' $N_{min}0$ was <1%, but 40% of their N was mineralized within 7 d. The N in these products consists almost entirely of protein, which is hydrolyzed by proteases when incorporated into soil (Ciavatta, Govi, Sitti, & Gessa, 1997; Hadas & Kautsky, 1994; Jan, Roberts, Tonheim, & Jones, 2009). The potentially plant-available N observed from slaughter and liquid amendments was similar to that observed in other studies (Delin et al., 2012; Hadas & Kautsky, 1994; Hadas & Rosenberg, 1992; Hartz & Johnstone, 2006; Hartz, Smith, & Gaskell, 2010; Manojlović et al., 2010), which found that mineral N plateaued at 60 to 80% of added N. Most of this was mineralized within the first 2 wk. Curves for the pelleted and granular blends tended to resemble combinations of the amendments from which they were made, suggesting that processing did not notably change their release properties.

The N mineralization rates of unshaken food hydrolysate (Food) and shaken food hydrolysate (FoodS) were not compared statistically because they were incubated at different dates; however, mineralization from FoodS appeared to be slightly faster (Figure 1d), suggesting a greater lability of the components that had fallen out of suspension. The N_{tot} of FoodS was 12% higher than that of Food (Table 1). Similarly, Hartz et al. (2010) found that about 8–21% of N contained in liquid fertilizers resided in particulate materials, which may be lost during filtration. Although values for $N_{min}84$ were similar between FoodS and Food, FoodS had greater N_{tot}, indicating a higher absolute net mineral N concentration after 84 d of incubation.

Despite the different shapes of their mineralization curves, $N_{min}84$ values were similar among PMCs from different batches and facilities. However, comparison with other studies suggests the material is more variable. The composition of a PMC varies depending on type of poultry, composting method and duration, bedding material, and storage method (Bernal et al., 1998a; Gale et al., 2006; Leconte, Mazzarino, Satti, & Crego, 2011; Preusch et al., 2002; Tyson & Cabrera, 1993). Both facilities in this study used rice hulls as the bedding material, which is a common agricultural waste in California but not in most of the United States. The $N_{min}0$ values in these PMCs are greater than those reported by Hartz et al. (2000), who collected seven PMCs from around California and found initial inorganic N concentrations ranging from 0–8% of the amendment's total N, with an additional 3–15% of the organic N mineralized over 84 d of incubation at 25°C. Other studies with PMCs have found $N_{min}0$ values of < 5%, with additional mineralization potentials of < 10% (Leconte et al., 2011; Preusch et al., 2002; Tyson & Cabrera, 1993). In contrast, $N_{min}0$ from PMCs in the current study ranged from 15–25% of their total N content (Table 1), and N_0 plateaued at around 20% of organic N (Supplemental Table S2). The $N_{min}84$ values were similar to potentially plant-available N measured in uncomposted or incompletely composted poultry litters (Gale et al., 2006; Sims, 1986). As discussed above,

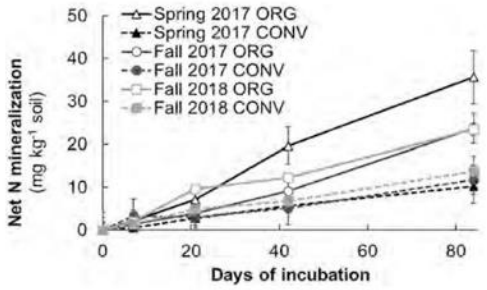

FIGURE 2 Nitrogen mineralized from organic (ORG) and conventional (CONV) control soils over 84 d of incubation at 23°C and 60% water holding capacity. Soils were collected from the same fields in spring and fall of 2017 and fall of 2018. Bars represent SEM ($n = 4$)

it is possible that the PMCs in our study had not completed the composting process.

The N mineralization amount and timing reported here are more accurate for warm and moist soils; mineralization may be slower in drier soils or under cool conditions. Where N release follows first-order kinetics, temperature affects the rate constant k more than the mineralization potential N_0 (De Neve, Pannier, & Hofman, 1996; Griffin & Honeycutt, 2000). For high-N materials, temperature differences would mainly be important during the first few days after incorporation, and therefore differences may not be on a scale relevant to growers. Hartz and Johnstone (2006) observed that, for four high-N amendments at 4 wk of incubation, a temperature decrease from 25 to 10°C decreased mineralization by 20% or less. A similar effect was observed for liquid amendments incubated at 15 and 25°C (Hartz et al., 2010). For low-N materials and those that do not follow first-order kinetics, the mineralization potential is more likely to be affected for a longer period (Agehara & Warncke, 2005).

3.2 | Soil effect on amendment nitrogen mineralization

Net N mineralization was higher in the unamended ORG soils than in the CONV soils at all dates (Figure 2). This is expected given the ORG site's long-term history of compost and cover crop addition; samples taken in spring from the plow layer of both sites show that SOC was 38% greater in the ORG soil than in the CONV soil (Table 2). For the CONV site, which received neither winter cover crop nor compost, N mineralization was similar from soils collected at all dates. Conversely, the ORG soils mineralized more N in spring than at either fall date, suggesting that the recently incorporated cover crop, which was the only amendment applied to the ORG soil in that year, contributed a large pool of labile organic matter relative to the fall soils. These were collected at the end of the season and had received no residue inputs (i.e., tomato plants were still standing in fall 2017 and fall 2018 CONV soil, and in fall 2018 ORG soil wheat straw had been removed).

Despite the soil differences, $N_{min}84$ did not differ significantly between the two soil types for any of the amendments (Table 3). A significant soil effect was observed during the first week of the spring incubation, where available N after 7 d of incubation in the CONV soils was significantly higher than in the ORG soils (Table 3; Supplemental Table S1). At that date, all ORG amendments had lower available N after 7 d of incubation than their CONV counterparts (Supplemental Table S1), suggesting that the significant soil effects were similar across all amendments. A significant main effect of soil and interaction with amendment was observed at 42 d of incubation in the Fall 2018 incubation (Table 3). Two amendments (the GF4% and YTC/PMC blend) had lower available N after 42 d of incubation in the CONV soil than in the ORG soil at this date. We do not have a plausible explanation for this temporary difference.

Our results are in line with many studies that observed that soil management history has only a transitory effect on net N mineralization from recently added amendments (Hadas et al., 1996; Nett, Ruppel, Ruehlmann, George, & Fink, 2012; Stark, Condron, O'Callaghan, Stewart, & Di, 2008). However, the difference in the first week of the spring incubation has implications for the shape of the mineralization curve. Modeling the rate constant and mineralization potential for amendments that followed first-order kinetics shows a higher mineralization rate constant but a lower mineralization potential for the CONV soil in spring—that is, in the spring CONV soil amendment N mineralized more quickly than in the ORG soil but plateaued at a lower value (Supplemental Table S2). The temporary dampening of net N mineralization from amendments incubated in the ORG soil in spring is consistent with the observation that, when a soil has a high concentration of readily available C, more of its N will be immobilized into the microbial biomass, from which it is later slowly mineralized (Burger & Venterea, 2008; Mallory & Griffin, 2007).

Although the two soils were mapped as the same series, the ORG soil had a sandier texture than the CONV soil, such that management and texture were confounded (Table 1). Several studies have observed greater net mineralization from coarse-textured soils than from fine-textured soils (Castellanos & Pratt, 1981; Gordillo & Cabrera, 1997; Sørenson & Jensen, 1995), an effect often attributed to increased microbial biomass due to a more protected habitat in higher-clay soils (Amato & Ladd, 1992). However, the fact that differences between ORG and CONV soils occurred in spring but not fall suggests they were related to management more than to texture. In this case it was the finer-textured CONV soil that had temporarily higher mineralization.

TABLE 3 Significance of the simple and interactive effects of amendment type and soil on available N after 7 ($N_{min}7$), 21 ($N_{min}21$), 42 ($N_{min}42$), and 84 ($N_{min}84$) days of incubation at 23°C and 60% water holding capacity. Comparisons were only made within an incubation date

Date	Effect	$N_{min}7$	$N_{min}21$	$N_{min}42$	$N_{min}84$
Spring 2017	amend	<0.0001	<0.0001	<0.0001	<0.0001
	soil	0.0007	0.4601	0.0765	0.5744
	amend × soil	0.4419	0.9936	0.1403	0.1746
Fall 2017	amend	<0.0001	<0.0001	<0.0001	<0.0001
	soil	0.4132	0.9625	0.7287	0.1207
	amend × soil	0.5909	0.5217	0.8427	0.7164
Fall 2018	amend	<0.0001	<0.0001	<0.0001	<0.0001
	soil	0.8224	0.8055	0.0137	0.0627
	amend × soil	0.0967	0.4264	0.0276	0.1131

3.3 | Amendment biochemical characteristics

The N concentrations in the incubated amendments ranged from 0.72 to 15.6% of their dry weight (Table 1). The C/N ratios ranged from a low of near 1:1 in the pelleted seabird guano to over 20:1 in some batches of YTC-Y. As expected, the manure composts as well as the pelleted, slaughter, and liquid amendments had higher N concentrations than the plant-based composts. Expressed as they are marketed (i.e., on a liquid basis), the 2–3% N concentrations for the liquid amendments were low compared with other fertilizers designed as sources of quickly available N to growing plants. When calculated on a dry-weight basis, the values were more comparable (6–8% N). The C/N ratios for the liquid amendments were similar to those of higher-N amendments (i.e., around 5:1).

Across the dataset, the C/N ratio was a good indicator of an amendment's $N_{min}84$ (Figure 3a). The $N_{min}84$ was also strongly related to the N concentration when the latter was expressed on a dry-weight basis for all amendments (Figure 3b). This relationship broke down if the fresh weight N concentration of the liquid amendments was used ($R^2 = 0.46$). Liquid amendment N concentrations are always guaranteed and are reported on a fresh-weight basis; therefore, the fact that the C/N ratio is independent of the amendment's moisture content makes it a more useful parameter for comparing liquid and solid amendments. The C/N ratio was a better predictor of $N_{min}84$ than N concentration for the fertilizers (pelleted and slaughter products; $R^2 = 0.88$ and 0.70, respectively) and YTCs ($R^2 = 0.90$ and 0.51, respectively). The N concentration, however, was a better predictor for the manure composts ($R^2 = 0.81$ and 0.92, respectively). Neither parameter was a good predictor of $N_{min}84$ within the liquid products ($R^2 = 0.11$ and 0.05, respectively).

The shape of the observed relationship between C/N ratio and mineralized N agreed well with those observed by Gale et al. (2006) and Delin et al. (2012). Both of these studies measured a wide range of composted, noncomposted, and

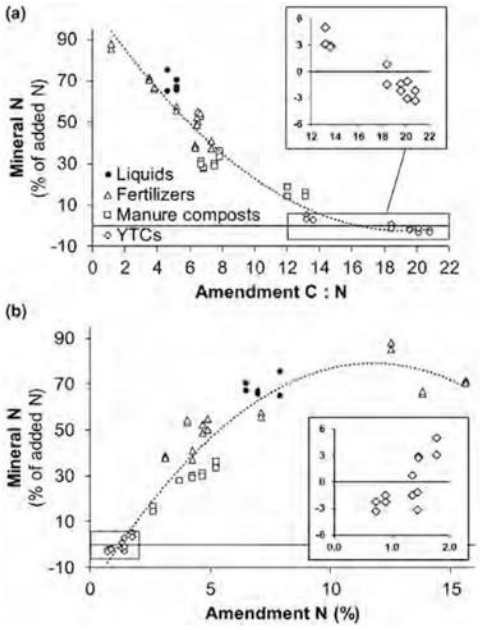

FIGURE 3 Relationship between the proportion of N in the mineral form after 84 d of incubation at 23°C in conventional (CONV) or organic (ORG) soil and (a) amendment C/N ratio and (b) amendment N concentration on a dry-weight basis. Insets represent the yard trimmings composts (YTCs). The R^2 value for the trendline in graph (a) is 0.927. The trendline in graph (b) has an R^2 value of 0.915

specialty amendments; however, the former study reports mineralization in terms of plant-available N from field-applied amendments, and the latter reports mineralization in terms of mineral fertilizer equivalent in a pot study. In both these studies, the predicted potential N release tended to be slightly (on average around 7%) higher than the $N_{min}84$ we measured at equivalent C/N ratios. This may be due to

a variety of factors, including the presence of living plants, differences in application method, rate, experiment duration, and conditions, and method of calculating N availability.

These overall relationships on N availability with C/N ratio or N concentration are more useful for obtaining a general estimate of an amendment's N mineralization potential than for predicting exact values within a group of similar amendments, because the R^2 value is partly a function of the range of C/N ratios or N concentrations under consideration (Hartz et al., 2000). For example, the good correlation for the manure composts is due to the inclusion of the vermicompost and the YTC/PMC blend, which had C/N ratios nearly double those of the PMCs. Within the PMCs, which occurred over a narrow range of C/N ratios, there was no relationship with $N_{min}84$.

The C/N ratio was a more reliable predictor than the N concentration of whether a compost would immobilize N. Several studies have reported organic amendment C/N ratio threshold values above which N is immobilized, including 15:1 (Gale et al., 2006), between 16:1 and 19:1 (Calderón et al., 2005), and 21:1 (van Kessel, Reeves, & Meisinger, 2000). In the present study, amendments with C/N ratios > 19:1 always immobilized N, whereas amendments with C/N ratios < 14:1 always mineralized N. All YTCs with a total N concentration < 1.3% (dry weight) immobilized N. However, some of the strongest immobilization occurred in YTC-Y3, which had a relatively high N concentration (1.4% dry weight) but was less decomposed.

No raw manures were included in this study because they are rarely applied to organic vegetables in California due to food safety concerns. With these materials, the initial quality of the C is extremely variable and is likely to have more of an effect on N mineralization potential than in composted amendments, and thus the C/N ratio may be a less reliable indicator (Calderón et al., 2005; Sims, 1986). Composting reduces some of this variability (Preusch et al., 2002).

3.4 | Implications for 4R management of organic fertilizers

The results of this study have implications for efficient rate, type, timing, and placement of organic fertilizers. The amount of N that will become available from a given fertilizer application rate can be broadly predicted by amendment type and C/N ratio, regardless of soil management. In addition, low rates of guano, liquids, and slaughter products are likely more efficient than high rates, especially on alkaline soils, because amendments that mineralize N quickly can increase salinity and NH_3 concentrations, reducing microbial activity and decreasing the total proportion of N mineralized (Cayuela, Sinicco, & Mondini, 2009; Hadas et al., 1983).

Because of compost's slow mineralization, the annual N applications may far exceed plant uptake, raising concerns about potential groundwater pollution if unused N, building up over time, is mineralized and leached when no crop is present. Although the experiment was not designed to assess this issue, long-term field research suggests that over time, the N mineralization rate from YTCs remains low enough (< 2.5% per year after initial application) that it is unlikely to be a serious risk, especially if cropped year-round (Horrocks, Curtin, Tregurtha, & Meenken, 2016; Sullivan et al., 2003). A greater proportion of manure-based compost N becomes plant available, and buildup from annual applications may result in leaching in the absence of winter crops (Evanylo et al., 2008).

Efficient timing for applying organic amendments depends on amendment type. Amendments varied in their degrees of maturity among compost batches and facilities, and immature composts may cause N or oxygen limitations for growing seedlings (Bernal, Alburquerque, & Moral, 2009). Individual batches therefore should be tested for maturity (CCQC, 2001), and incorporating immature composts less than a week before planting may be risky. For yard trimmings composts, for which N mineralization is likely slow enough that significant N leaching over winter is less of a risk, application during the previous fall for spring-planted crops may be safest. Conversely, the quick mineralization from almost all the fertilizer products suggests that, under warm and moist conditions, applications should be synchronized with plant demand to avoid leaching losses. Preliminary work by our laboratory and studies with similar amendments suggest that significant mineralization can occur within a few weeks even under cooler temperatures (< 5°C) (Agehara & Warncke, 2005; Hartz et al., 2010; Sims, 1986).

Initial NH_4 concentration and N mineralization rate have implications for amendment placement. A considerable amount of N may be lost through NH_3 volatilization when amendments with a high NH_4 concentration are surface applied. In manure-based composts, liquid fertilizers, and most granular and pelleted fertilizers, at least 10% of the total N was NH_4–N and would be susceptible to volatilization if not incorporated (Derikx et al., 1994; Hadas et al., 1983). Concentrated bands of fast-releasing materials such as the guano or slaughter products should be applied at a safe distance from the seedling because fast mineralization rates are associated with high NH_3 concentrations, which may inhibit germination or injure seedlings of sensitive species (Diaz-Perez, Jenkins, Pitchay, & Gunawan, 2017). The low concentrations applied through fertigation, typically 10–20 kg N ha^{-1} in an application, are less likely to be a risk.

4 | CONCLUSIONS

The results of this study can inform the 4Rs of efficient N management for organic fertilizers. The organic amendments tested have a wide range of potentially crop-available N ranging from immobilization by some yard trimmings composts to 80–90% of the N applied as seabird guano. However, across all materials the proportion of total N that was in the mineral form after 84 d of incubation was closely related to the C/N ratio. The timing of potential N mineralization may have been somewhat slowed by the high concentration of labile C present in the organically managed soil in spring, but otherwise N mineralization from all amendments was generally similar between two soils with different textures and management histories.

ACKNOWLEDGMENTS

We thank Alison Mann and Irfan Ainuddin for their excellent technical assistance; the compost facilities, fertilizer companies, and growers who generously donated amendment samples and topsoil; and Mussie Habteselassie and three anonymous reviewers for their insightful comments and suggestions.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ORCID

Patricia Lazicki https://orcid.org/0000-0002-2481-3116
Daniel Geisseler https://orcid.org/0000-0002-5483-9982

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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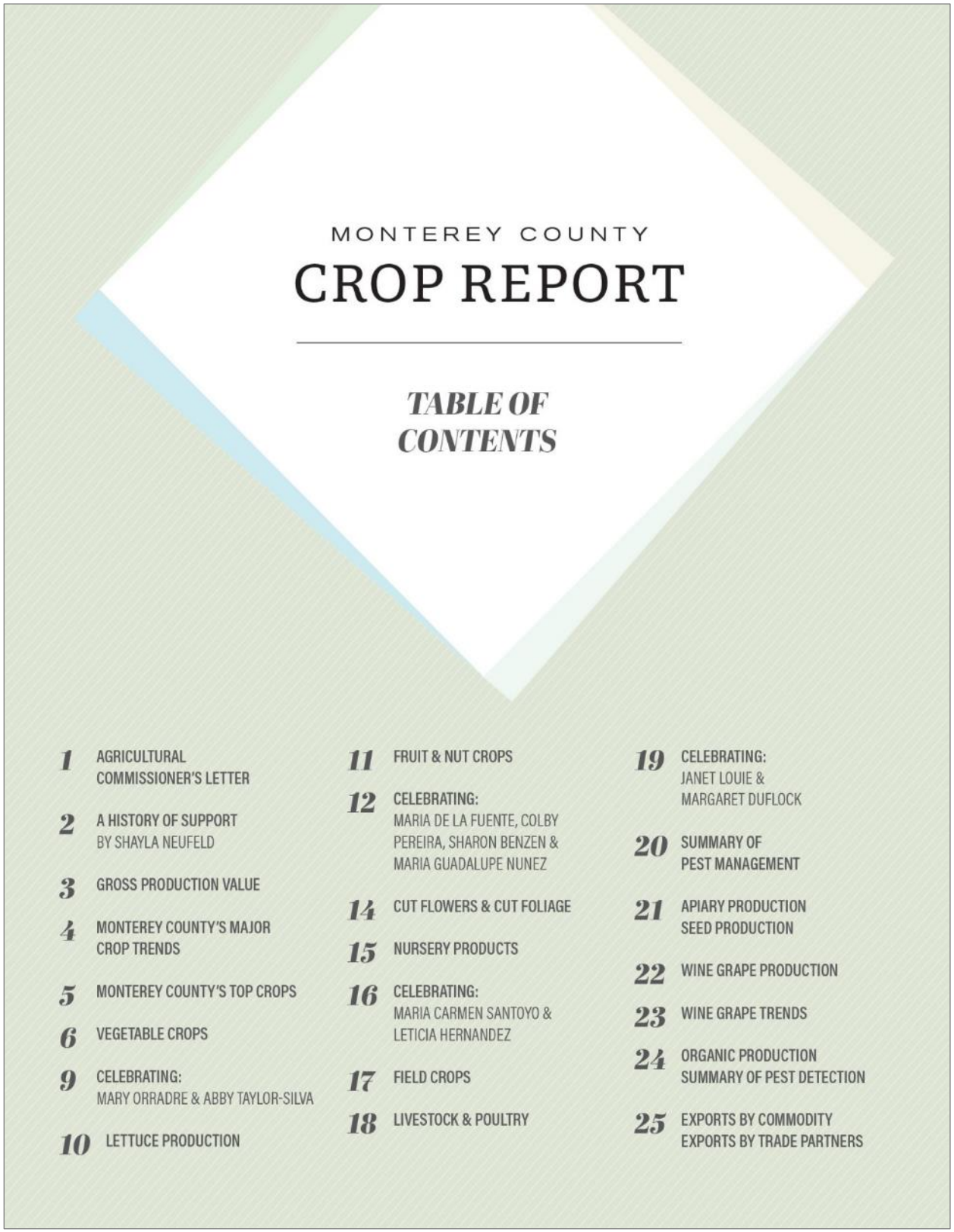
Attachment 2

MONTEREY COUNTY

CROP REPORT

2018



MONTEREY COUNTY

CROP REPORT

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In accordance with Sections 2272 and 2279 of the California Food and Agricultural Code, I am pleased to release the 2018 Annual Crop Report for the County of Monterey. This report reflects a production value of $4,258,629,000 which is a decrease of 3.7% from 2017. It is important to note that the values represented in this report reflect gross value of agricultural commodities grown in Monterey County and not the costs associated with labor, field preparation, planting, irrigating, harvesting, distribution, and other production activities. As is always the case, we saw some crops increase in value while others decreased in value. The following are the major increases and decreases.

Leaf lettuce is our top crop with a value of $733,171,000. This represents an 11.6% decrease from 2017 and is largely attributed to a reduction in Romaine lettuce production. Outbreaks of *E. Coli* infections resulting in Food Safety Alerts from the Centers for Disease Control and Prevention negatively impacted Romaine lettuce production. Strawberries came in as the 2nd most valuable crop at $698,510,000 with an increase of 1.9% or $12,752,000. The increase mostly resulted from improved pricing for strawberries slated for processing. Head lettuce was again the 3rd most valuable crop at $459,452,000, a decrease of 8.6%. The decrease in head lettuce production was due to decreases in production and pricing. Broccoli repeated its 4th place ranking with a 5.2% decrease to $388,946,000.

The Vegetable Crops category saw a decrease in value of $135,758,000 to $2,871,099,000. Fruits and Nuts category saw an increase of $9,784,000 to $1,043,856,000. Nursery Crops suffered a decrease of 21.2% or $52,000,000 due to decreases in acreage, production, and prices. Wine Grapes saw an increase of 3.7% or $8,866,000 to reach a total for red and white varietals of $247,758,000.

The above average rains contributed to increased production in several crops such as livestock, alfalfa, and pastureland. Field Crops increased in value by $2,073,000 to $23,748,000. Livestock and Poultry increased $9,184,000 to $110,598,000.

This report would not be possible without the voluntary contribution of the agricultural industry in providing us with their data. This year, in addition to presenting our crop values, we are Celebrating Women in Agriculture and are featuring a collection of vignettes about some of the women that make Monterey County agriculture thrive. Credit for the successful creation of this report goes to our staff, specifically Shayla Neufeld who authored the article *Women in Monterey County Agriculture: A History of Support, A Future of Growth,* Yvonne Perez who worked with Shayla on the interviews for the vignettes and much more, Graham Hunting for his supervision of the crop report staff, and Rich Ordonez for his overall management of the project.

Respectfully submitted,

Henry S. Gonzales
Agricultural Commissioner

COUNTY OF MONTEREY AGRICULTURAL COMMISSIONER
1428 Abbott Street, Salinas, California 93901
tel (831) 759-7325 · fax (831) 759-2268 · ag.co.monterey.ca.us

WOMEN IN MONTEREY COUNTY AGRICULTURE

A HISTORY OF SUPPORT, A FUTURE OF GROWTH

BY SHAYLA NEUFELD

Monterey County, the growers and shippers to ranchers and executives, is full of forward-thinking, innovative and supportive people. The community continues to passionately and wholeheartedly devote its time, energy and experience to making Monterey County agriculture a community of excellence.

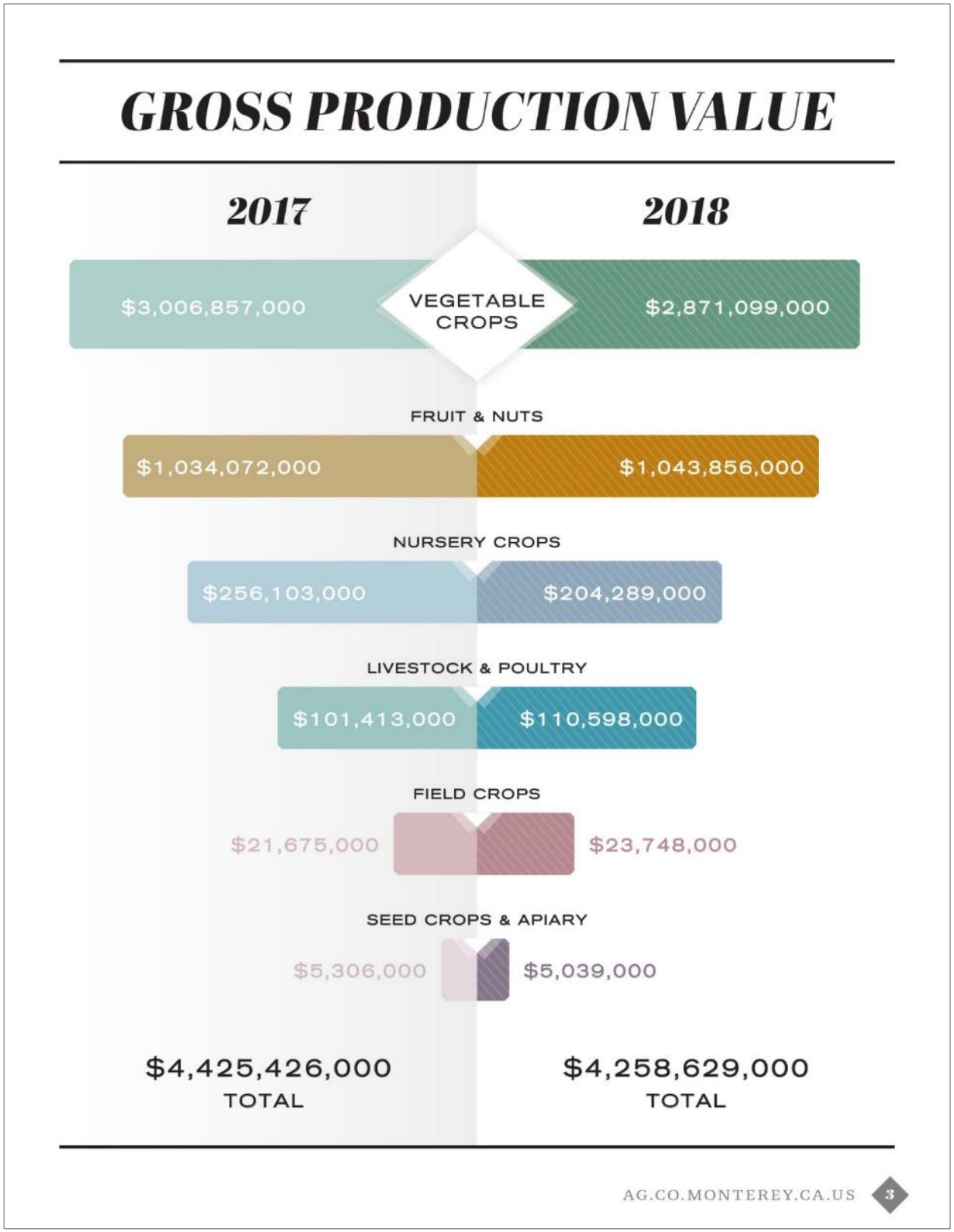
The crop report this year celebrates the strides made by women, and for women, in Monterey County. We celebrate by sharing the stories of women in agriculture across all key sectors that are essential for this county's success.

I had the pleasure of speaking to a number of local women in a variety of positions and sectors of agriculture. One of the stories we're excited to share is about Maria Guadalupe Nunez, who views her fellow fieldworkers as family. The success stories don't stop with women in the field. One such person who we profile is Colby Pereira, a descendant of a farming family, who is now Manager of Food Safety Program and Regulatory Compliance for Costa Farms.

As I spoke to each of these women, a common thread wove their stories together. The women are passionate about the role they play in the greater process of developing fruitful, life-giving resources for their community.

Each of these inspiring women also shared examples of the support and encouragement they have received throughout their careers in agriculture. Some had the luck of good role models early in their career, while others forged their own paths. Many have raised families without compromising their quality of work, or the success of their companies and farms.

The foundation of support throughout Monterey County agriculture has encouraged them to reinvest that same support in the next generation of women in agriculture. No woman should feel overlooked, and through mentorships, sponsorships, educational opportunities, women in Monterey County agriculture are ready to reinvest time, energy and support for the next generation of agriculture professionals.


GROSS PRODUCTION VALUE
2017
2018
VEGETABLE CROPS
$3,006,857,000
$2,871,099,000
FRUIT & NUTS
$1,034,072,000
$1,043,856,000
NURSERY CROPS
$256,103,000
$204,289,000
LIVESTOCK & POULTRY
$101,413,000
$110,598,000
FIELD CROPS
$21,675,000
$23,748,000
SEED CROPS & APIARY
$5,306,000
$5,039,000
$4,425,426,000
TOTAL
$4,258,629,000
TOTAL
AG.CO.MONTEREY.CA.US
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MONTEREY COUNTY'S

MAJOR CROP TRENDS

CROP		1998	2008	2018
Artichoke	Acre	6,451	5,993	4,469
	Value	$38,801,000	$66,642,000	$53,156,000
	CPI Adjusted*	$59,511,000	$77,401,000	-
Broccoli	Acre	53,953	52,516	52,442
	Value	$246,364,000	$276,110,000	$388,946,000
	CPI Adjusted	$377,859,000	$320,685,000	-
Cauliflower	Acre	18,701	16,723	19,636
	Value	$104,637,000	$101,467,000	$209,292,000
	CPI Adjusted	$160,486,000	$117,848,000	-
Celery	Acre	8,720	10,405	10,088
	Value	$78,082,000	$121,343,000	$145,400,000
	CPI Adjusted	$119,758,000	$140,933,000	-
Grapes (Wine)	Acre	39,901	40,144	44,924
	Value	$178,610,000	$238,366,000	$247,758,000
	CPI Adjusted	$273942,00	$276,848,000	-
Head Lettuce	Acre	57,738	54,919	38,172
	Value	$359,644,000	$460,605,000	$459,452,000
	CPI Adjusted	$551,601,000	$534,965,000	-
Leaf Lettuce	Acre	32,835	95,327	57,357
	Value	$209,624,000	$651,503,000	$733,171,000
	CPI Adjusted	$321,509,000	$756,682,000	-
Mushroom	Pounds	47,032,000	44,084,000	46,020,000
	Value	$55,968,000	$71,857,000	$95,261,000
	CPI Adjusted	$85,840,000	$83,458,000	-
Nursery	Acre	2,739	1,866	998
	Value	$154,297,000	$326,105,000	$204,289,000
	CPI Adjusted	$236,652,000	$378,751,000	-
Spinach	Acre	12,270	13,495	16,200
	Value	$60,903,000	$131,004,000	$143,376,000
	CPI Adjusted	$93,410,000	$152,153,000	-
Strawberry	Acre	6,540	10,449	9,839
	Value	$198,415,000	$619,267,000	$698,510,000
	CPI Adjusted	$304,317,000	$719,242,000	-
TOTAL OF MAJOR CROPS ABOVE	**Acre**	**239,848**	**301,837**	**254,125**
	Value	**$1,685,345,000**	**$3,064,269,000**	**$3,378,611,000**
	CPI Adjusted	**$2,584,885,000**	**$3,558,966,000**	**-**

* Consumer Price Index Conversion http://liberalarts.oregonstate.edu/sites/liberalarts.oregonstate.edu/files/polisci/faculty-research/sahr/inflation-conversion/pdf/cv2018.pdf

2018 MONTEREY COUNTY CROP REPORT

CROP	2018 CROP VALUE	2018 CROP RANKING	2017 CROP RANKING
Leaf Lettuce	**$733,171,000**	**1**	**1**
Strawberry	**$698,510,000**	**2**	**2**
Head Lettuce	**$459,452,000**	**3**	**3**
Broccoli	**$388,946,000**	**4**	**4**
Wine Grape	**$247,758,000**	**5**	**6**
Cauliflower	**$209,292,000**	**6**	**7**
Misc. Vegetables	**$205,285,000**	**7**	**8**
Nursery	**$204,289,000**	**8**	**5**
Celery	**$145,400,000**	**9**	**9**
Spinach	**$143,376,000**	**10**	**10**
Livestock & Poultry	$110,598,000	11	12
Mushroom	$95,261,000	12	11
Brussels Sprout	$78,300,000	13	13
Peas	$61,387,000	14	16
Artichoke	$53,156,000	15	15
Kale	$48,151,000	16	17
Lemon	$41,612,000	17	20
Onion, Dry	$38,250,000	18	21
Cabbage	$37,924,000	19	19
Spring Mix	$37,414,000	20	18
Raspberry	$35,367,000	21	14
Carrot	$30,248,000	22	22
Rangeland	$19,151,000	23	23
Garlic	$16,380,000	24	-
Chard	$15,198,000	25	25
Blackberry	$14,651,000	26	26

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VEGETABLE CROPS

CROP[1]	YEAR	ACREAGE	PRODUCTION PER ACRE	TOTAL	UNIT	VALUE PER UNIT	TOTAL[2]
Anise / Fennel	2018	848	18.93	16,100	ton	$903.00	$14,538,000
	2017	797	19.69	15,700	ton	$1,140.00	$17,898,000
Artichoke	2018	4,469	6.13	27,400	ton	$1,940.00	$53,156,000
	2017	4,822	5.85	28,200	ton	$1,750.00	$49,350,000
Asparagus	2018	1,297	4.24	5,500	ton	$2,620.00	$14,410,000
	2017	1,460	4.02	5,870	ton	$1,980.00	$11,623,000
Bok Choy	2018	387	11.49	4,450	ton	$818.00	$3,640,000
	2017	377	15.99	6,030	ton	$770.00	$4,643,000
Broccoli, Bulk[3]	2018	—	—	94,900	ton	$795.00	$75,446,000
	2017	—	—	88,400	ton	$948.00	$83,803,000
Broccoli, Fresh	2018	39,332	7.24	285,000	ton	$1,100.00	$313,500,000
	2017	37,330	7.62	284,000	ton	$1,150.00	$326,600,000
Broccoli, Total	2018	52,442	—	—	—	—	$388,946,000
	2017	48,916	—	—	—	—	$410,403,000
Brussels Sprout	2018	4,187	10.39	43,500	ton	$1,800.00	$78,300,000
	2017	3,356	10.15	34,100	ton	$2,240.00	$76,384,000
Cabbage, Bulk	2018	—	—	49,200	ton	$238.00	$11,710,000
	2017	—	—	51,500	ton	$250.00	$12,875,000
Cabbage, Fresh	2018	2,516	20.36	51,200	ton	$512.00	$26,214,000
	2017	2,320	21.70	50,300	ton	$569.00	$28,621,000
Cabbage, Total	2018	4,934	—	—	—	—	$37,924,000
	2017	4,695	—	—	—	—	$41,496,000

1 Organic production included.
2 Totals may not calculate due to rounding.
3 Bulk may include one or more of the following: food service, processing and/or value added.

VEGETABLE CROPS (CONTINUED)

CROP	YEAR	ACREAGE	PRODUCTION PER ACRE	TOTAL	UNIT	VALUE PER UNIT	TOTAL
Carrot, Bulk	2018	—	—	37,700	ton	$407.00	$15,344,000
	2017	—	—	42,800	ton	$370.00	$15,836,000
Carrot, Fresh	2018	1,160	19.82	23,000	ton	$648.00	$14,904,000
	2017	1,340	20.37	27,300	ton	$594.00	$16,216,000
Carrot, Total	2018	2,417	—	—	—	—	$30,248,000
	2017	2,770	—	—	—	—	$32,052,000
Cauliflower, Bulk	2018	—	—	31,500	ton	$848.00	$26,712,000
	2017	—	—	28,100	ton	$840.00	$23,604,000
Cauliflower, Fresh	2018	16,691	10.71	179,000	ton	$1,020.00	$182,580,000
	2017	15,975	9.58	153,000	ton	$1,180.00	$180,540,000
Cauliflower, Total	2018	19,636	—	—	—	—	$209,292,000
	2017	18,905	—	—	—	—	$204,144,000
Celery, Bulk	2018	—	—	23,800	ton	$400.00	$9,520,000
	2017	—	—	30,300	ton	$431.00	$13,059,000
Celery, Fresh	2018	9,382	33.68	316,000	ton	$430.00	$135,880,000
	2017	10,670	32.73	349,000	ton	$460.00	$160,540,000
Celery, Total	2018	10,088	—	—	—	—	$145,400,000
	2017	11,597	—	—	—	—	$173,599,000
Chard	2018	1,237	8.25	10,200	ton	$1,490.00	$15,198,000
	2017	1,108	9.38	10,400	ton	$1,560.00	$16,224,000
Cilantro	2018	1,268	7.01	8,890	ton	$1,610.00	$14,313,000
	2017	1,139	7.64	8,700	ton	$1,120.00	$9,744,000
Garlic*	2018	886	10.56	9,360	ton	$1,750.00	$16,380,000
	2017	-	-	-	ton	-	-
Kale	2018	2,611	10.30	26,900	ton	$1,790.00	$48,151,000
	2017	2,931	10.30	30,200	ton	$1,530.00	$46,206,000
Leek	2018	589	13.30	7,830	ton	$1,390.00	$10,884,000
	2017	475	12.53	5,950	ton	$1,440.00	$8,568,000

* Previously included in Misc. Vegetables

"FIND WHAT SPEAKS TO YOUR HEART AND SOMETHING YOU HAVE A GENUINE INTEREST IN BECAUSE THE POSSIBILITIES ARE ENDLESS WITH AGRICULTURE."

Colby Pereira

VEGETABLE CROPS (CONTINUED)

CROP	YEAR	ACREAGE	PRODUCTION PER ACRE	TOTAL	UNIT	VALUE PER UNIT	TOTAL
Lettuce, Total[4]	2018	95,529	—	—	—	—	$1,192,623,000
	2017	106,863	—	—	—	—	$1,332,258,000
Misc. Vegetables, Bulk	2018	—	—	179,000	ton	$735.00	$131,565,000
	2017	—	—	173,000	ton	$713.00	$123,349,000
Misc. Vegetables, Fresh	2018	11,424	6.65	76,000	ton	$970.00	$73,720,000
	2017	11,923	6.17	73,600	ton	$899.00	$66,166,000
Misc. Vegetables, Total[5]	2018	40,602	—	—	—	—	$205,285,000
	2017	39,961	—	—	—	—	$189,515,000
Mushroom	2018	145	—	46,020,000	lbs	$2.07	$95,261,000
	2017	153	—	48,412,000	lbs	$2.18	$105,538,000
Napa Cabbage	2018	336	14.11	4,740	ton	$864.00	$4,095,000
	2017	310	15.67	4,860	ton	$1,080.00	$5,249,000
Onion, Dry	2018	1,919	39.86	76,500	ton	$500.00	$38,250,000
	2017	2,170	32.58	70,700	ton	$460.00	$32,522,000
Parsley	2018	261	11.49	2,990	ton	$1,400.00	$4,186,000
	2017	290	9.82	2,850	ton	$1,420.00	$4,047,000
Peas[6]	2018	5,338	—	—	—	—	$61,387,000
	2017	4,892	—	—	—	—	$48,920,000
Peppers[7]	2018	518	24.71	12,800	ton	$390.00	$4,992,000
	2017	546	17.16	9,370	ton	$392.00	$3,673,000
Radish	2018	193	12.64	2,440	ton	$1,090.00	$2,660,000
	2017	184	11.85	2,180	ton	$1,110.00	$2,420,000
Spinach, Bulk	2018	—	—	122,000	ton	$984.00	$120,048,000
	2017	—	—	112,000	ton	$1,000.00	$112,000,000
Spinach, Fresh	2018	1,900	8.50	16,200	ton	$1,440.00	$23,328,000
	2017	1,793	8.50	15,200	ton	$1,520.00	$23,104,000
Spinach, Total	2018	16,200	—	—	—	—	$143,376,000
	2017	14,993	—	—	—	—	$135,104,000
Spring Mix	2018	4,618	8.25	38,100	ton	$982.00	$37,414,000
	2017	6,597	7.22	47,600	ton	$935.00	$44,506,000
Squash	2018	116	11.72	1,360	ton	$581.00	$790,000
	2017	152	10.46	1,590	ton	$485.00	$771,000
VEGETABLE CROPS TOTAL	**2018**	**273,071**					**$2,871,099,000**
	2017	**290,987**					**$3,006,857,000**

4 See Lettuce Production, page 10
5 Includes: Arugula, Beet, Broccolini, Cactus Pear, Collard Green, Cucumber, Fava Bean, Frisee, Green Onions, Herbs, Kohlrabi, Mache, Mustard, Pumpkin, Radicchio, Rappini, Salad Products, Tomato and Turnip.
6 Includes: Bulk
7 Includes: Bell Pepper, Chili Pepper and Pimento.

CELEBRATING

Mary Orradre

Mary grew up a city girl but always understood the importance of farming and ranching. She was introduced to the agricultural life when she married her husband and quickly learned the family cattle business. Today, Mary considers herself an advisor to Orradre Ranch by discussing current trends, regulations, business events, daily operations and overall support. She has been honored numerous times by the agriculture community, including Agriculture Woman of the Year in 2005. Mary's favorite part of agriculture is the seasonality of crops; the growing of green grazing grass, calving and the renewability of each life cycle. She hopes the laws and regulations will allow the next generation to continue with respect to the land and sustainability practices. Mary believes all people should be aware of all the good things agriculture does for them and open their eyes to the agriculture that surrounds them in Monterey County.

"MY FAVORITE PART OF AGRICULTURE IS THE SEASONALITY OF CROPS; THE GROWING OF GREEN GRAZING GRASS, CALVING AND THE RENEWABILITY OF EACH LIFE CYCLE."

CELEBRATING

Abby Taylor-Silva

Abby was born a farmer's daughter and she knew agriculture would be a part of her future. Paul Harvey's poem "So God Made a Farmer" speaks to her on many levels. Farmers are our caretakers, school board members, parents and active members in their community. People are her favorite part of agriculture and she finds fulfillment connecting people and building a networking community. An average day as Vice President of Policy and Communications for Grower-Shipper Association of Central California involves public meetings, interacting with farmers, talking to County Supervisors, Assembly members, regulators, preparing documents and reading technical papers. Abby's commitment to the Salinas Valley is only surpassed by her commitment to being a mom and raising her kids. Throughout her career, she has been family focused but still recognizes the value of saying yes to every opportunity possible. Abby advises women early in their careers to "find the people who are in your corner and say yes to as much as you can until you stop learning from that in which you originally said yes to; then say yes to the next thing." She adds, "When we build each other up, we lift the industry as a whole."

LETTUCE PRODUCTION

CROP	YEAR	ACREAGE	PRODUCTION PER ACRE	TOTAL	UNIT	VALUE PER UNIT	TOTAL
HEAD LETTUCE							
Naked	2018	—	—	5,457,000	ctn[8]	$12.50	$68,213,000
	2017	—	—	5,413,000	ctn	$13.00	$70,369,000
Wrapped	2018	—	—	20,735,000	ctn	$13.70	$284,070,000
	2017	—	—	21,370,000	ctn	$14.10	$301,317,000
Bulk	2018	—	—	257,000	ton	$417.00	$107,169,000
	2017	—	—	298,000	ton	$439.00	$130,822,000
HEAD LETTUCE, TOTAL	**2018**	**38,172**	**1,000**	**38,172,000**	**ctn**	—	**$459,452,000**
	2017	**40,476**	**1,000**	**40,476,000**	**ctn**	—	**$502,508,000**
LEAF LETTUCE							
Butter Leaf	2018	1,161	950	1,103,000	ctn	$9.22	$10,170,000
	2017	941	950	894,000	ctn	$11.70	$10,460,000
Endive	2018	287	1,100	316,000	ctn	$9.28	$2,932,000
	2017	300	1,100	330,000	ctn	$12.50	$4,125,000
Escarole	2018	154	1,100	169,000	ctn	$11.40	$1,927,000
	2017	162	1,100	178,000	ctn	$14.50	$2,581,000
Green Leaf	2018	8,278	950	7,864,000	ctn	$9.97	$78,404,000
	2017	8,971	950	8,522,000	ctn	$12.10	$103,116,000
Red Leaf	2018	3,546	950	3,369,000	ctn	$10.10	$34,027,000
	2017	3,464	950	3,291,000	ctn	$11.60	$38,176,000
Romaine, Bulk	2018	—	—	226,000	ton	$702.00	$158,652,000
	2017	—	—	234,000	ton	$395.00	$92,430,000
Romaine, Fresh[9]	2018	32,030	1,000	32,030,000	ctn	$13.30	$425,999,000
	2017	40,233	1,000	40,233,000	ctn	$14.00	$563,262,000
Leaf Lettuce, Bulk	2018	—	—	35,100	ton	$600.00	$21,060,000
	2017	—	—	26,000	ton	$600.00	$15,600,000
LEAF LETTUCE, TOTAL	**2018**	**57,357**	—	**57,242,000**	**ctn**	—	**$733,171,000**
	2017	**66,387**	—	**66,254,000**	**ctn**	—	**$829,750,000**
LETTUCE CROPS **TOTAL**	**2018**	**95,529**					**$1,192,623,000**
	2017	**106,863**					**$1,332,258,000**

8 Carton
9 Includes Romaine Hearts

"FOLLOW YOUR PASSION, TEACH WHAT YOU KNOW AND ALWAYS BE WILLING TO LEARN."

Maria de la Fuente

FRUIT & NUT CROPS

CROP	YEAR	ACREAGE	PRODUCTION PER ACRE	TOTAL	UNIT	VALUE PER UNIT	TOTAL
Avocado	2018	256	4.52	1,160	ton	$2,250.00	$2,610,000
	2017	383	3.08	1,180	ton	$3,240.00	$3,823,000
Blackberry	2018	303	8.10	2,450	ton	$5,980.00	$14,651,000
	2017	273	7.25	1,980	ton	$6,110.00	$12,098,000
Grapes (Wine)[10]	2018	44,924	4.00	180,000	ton	—	$247,758,000
	2017	44,299	3.86	171,000	ton	—	$239,027,000
Lemon	2018	1,269	32.47	41,200	ton	$1,010.00	$41,612,000
	2017	1,205	28.14	33,900	ton	$1,140.00	$38,646,000
Misc. Fruit[11]	2018	413	3.27	1,350	ton	$2,480.00	$3,348,000
	2017	510	3.30	1,680	ton	$2,700.00	$4,536,000
Raspberry	2018	602	7.90	4,760	ton	$7,430.00	$35,367,000
	2017	783	9.20	7,200	ton	$6,970.00	$50,184,000
Strawberry, Fresh	2018	9,839	50.72	499,000	ton	$1,380.00	$688,620,000
	2017	10,178	43.23	440,000	ton	$1,540.00	$677,600,000
Strawberry, Processing	2018	—	—	21,500	ton	$460.00	$9,890,000
	2017	—	—	21,300	ton	$383.00	$8,158,000
Strawberry, Total	2018	9,839	—	521,000	ton	—	$698,510,000
	2017	10,178	—	461,000	ton	—	$685,758,000
FRUIT & NUT CROPS **TOTAL**	**2018**	**57,606**					**$1,043,856,000**
	2017	**57,631**					**$1,034,072,000**

10 Represents Bearing Acres only; see Wine Grape Production, pages 22-23.
11 Includes: Apple, Blueberry, Kiwi, Loganberry, Olallieberry, Olive and Walnut.

CELEBRATING

Maria de la Fuente

Maria was inspired to work in agriculture because food gives sustenance to the body, education to the mind and spirituality to the soul. She is the Monterey County Director for University of California Cooperative Extension and enjoys feeding minds with university work and feeding the body with agriculture. Maria helps with outreach, partnerships with government agencies and all the various educational sectors within the university she oversees. One of the UC programs, California 4-H Youth Development, engages youth to become the citizens of tomorrow with the help of adult volunteers; all our volunteers are agents of the UC and help us share knowledge of agriculture and natural resources. "Follow your passion, teach what you know and always be willing to learn," she says. Education has always been a priority for Maria and she credits completion of her college and graduate schooling to her strong female role model -her mother- while growing up in Mexico. Advice she loves to share is that women can contribute in numerous ways to agriculture and society by voicing their opinions and being assertive. Maria believes if women know their rights and responsibilities, they can act accordingly in any situation.

THEY ARE ALL PASSIONATE ABOUT THE R

OF DEVELOPING FRUITFUL, LIFE-GIVIN

CELEBRATING

Colby Pereira

Colby has early childhood memories of growing up in a farming family, riding around in the pickup truck with her grandfather and attending meetings with him. Her grandmother, a role model to Colby, helped start the farm and was very involved in the business activities. As a third-generation member of Costa Farms, her family's farming operation, Colby manages the food safety program and regulatory compliance. She enjoys the variety that each day brings. "Every day is different and what I love about agriculture," Colby explains. She has always been deeply rooted in the community and Monterey County by volunteering to serve on numerous boards and committees. Being a forward thinker, she believes the global food system we are part of is constantly evolving and we must continuously evaluate opportunities to remain a stable force. Colby's advice to women: "Find what speaks to your heart and something you have a genuine interest in because the possibilities are endless with agriculture."

CELEBRATING

Sharon Benzen

As an Agronomist for USDA-Agricultural Research Service, Sharon manages the research farm and experiments. She coordinates farm crew and equipment, assigns land projects and oversees daily farming operations. In college she took a crop science class and was instantly hooked on agriculture. Sharon was drawn to Monterey County because of the climate and vastness of agriculture. She relishes in the opportunity to work outdoors, watch plants grow in the field and help solve complex research problems associated with specialty vegetable crop production. Sharon is excited for the role women will continue to play in the future as more women get involved and accept leadership positions. "Agriculture options are wide open because there are so many avenues women can get involved in," she said.

DLE THEY PLAY IN THE GREATER PROCESS
G RESOURCES FOR THEIR COMMUNITY.

CELEBRATING

Maria Guadalupe Nunez

Maria Guadalupe Nunez has been working in the fields of Monterey County since 1997. She came to the United States from Mexico to take care of children because her brothers were protective of her and initially didn't want her in the fields. A friend was able to help her get a job working in the vineyard, and then garlic and tomato fields. She was offered the responsibility of forewoman. It's hard work and she would sacrifice spending extra time with her daughter. In addition to weeding, fixing irrigation tape, and harvesting lettuce and grapes, she would oversee and shuttle the other workers. Maria's advice for other women in agriculture is to have a love for the job, which for her means working out in the open air because it's peaceful and reduces stress. She concludes, "Agriculture is a part of my life. My family lives far away, but my other family is my coworkers." In fact, 20 years ago, when Maria didn't know how to weed, the foreman for her crew taught her. She continues, "it doesn't matter how hard the work is, as long as my children are well. It is a blessing for me to work to provide for my family."

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CUT FLOWERS & CUT FOLIAGE

CROP	YEAR	ACREAGE	PRODUCTION QUANTITY SOLD	UNIT	VALUE PER UNIT	TOTAL
Chrysanthemum	2018	12.0	933,000	per bloom	$1.96	$1,829,000
	2017	14.8	1,734,000	per bloom	$1.27	$2,202,000
Eucalyptus	2018	72.8	213,000	per bunch	$1.76	$375,000
	2017	71.4	195,000	per bunch	$1.91	$372,000
Gerbera	2018	4.7	2,056,000	per bloom	$0.58	$1,192,000
	2017	6.3	2,441,000	per bloom	$0.59	$1,440,000
Misc. Cut Flowers & Cut Foliage[12]	2018	133.3	1,708,000	various	$2.84	$4,851,000
	2017*	139.0	1,608,000	various	$2.35	$3,780,000
Roses	2018	9.4	2,427,000	per bloom	$1.26	$3,058,000
	2017	9.9	2,639,000	per bloom	$1.26	$3,325,000
CUT FLOWERS & CUT FOLIAGE TOTAL	**2018**	**232**				**$11,305,000**
	2017	**241**				**$11,119,000**

12 Includes: Acacia, Alstroemeria, Asiatic Lily, Banksia, Belladonna, Boronia, Bulperum, Calla Lily, Carnations, Cornflower, Curly Willow, Dahlias, Delphinium, Euphorbia, Grevillea, Hydrangea, Iris, Kale, Lavender, Leather Leaf, Leucadendron, Lily, Limonium, Marigold, Oriental Lily, Protea, Ranunculus, Rosemary, Snapdragon, Statice, Sunflower, Tulips, Viburnum and Zinnia.
* Adjusted figure to include Alstroemeria and Tulips

"PEOPLE ARE MY FAVORITE PART OF AGRICULTURE. I FIND FULLFILLMENT IN CONNECTING PEOPLE AND BUILDING A NETWORKING COMMUNITY."

Abby Taylor-Silva

NURSERY PRODUCTS

CROP	YEAR	ACREAGE	PRODUCTION QUANTITY SOLD	UNIT	VALUE PER UNIT	TOTAL
Bedding Plants	2018	64.2	6,972,000	per plant	$3.21	$22,380,000
	2017	84.3	11,365,000	per plant	$3.28	$37,277,000
Misc. Nursery Products[13]	2018	330.5	19,768,000	various	$1.43	$28,268,000
	2017*	312.3	25,970,000	various	$1.11	$29,071,000
Orchids	2018	89.4	9,387,000	per plant	$7.85	$73,688,000
	2017	89.3	10,910,000	per plant	$8.09	$88,262,000
Poinsettia	2018	46.0	864,000	per plant	$4.10	$3,542,000
	2017	51.6	962,000	per plant	$4.09	$3,935,000
Potted Plants	2018	156.9	4,613,000	per plant	$5.51	$25,418,000
	2017	226.6	7,189,000	per plant	$5.16	$37,095,000
Vegetable Transplants	2018	78.7	992,205,000	per plant	$0.04	$39,688,000
	2017	157.1	2,467,207,000	per plant	$0.02	$49,344,000
NURSERY PRODUCTS **TOTAL**	**2018**	**766**				**$192,984,000**
	2017	**921**				**$244,984,000**
OVERALL NURSERY **TOTAL**[14]	**2018**	**998**				**$204,289,000**
	2017	**1,162**				**$256,103,000**

13 Includes: Annuals, Begonia, Bulbs, Christmas Trees, Corms, Cypress, Dusty Miller, Fruit & Nut Trees, Hakea, Herbs, Jasmine, Money Tree, Myrtle, Native Plants, Propagative Materials, Rhizomes, Tubers, Turf and Woody Ornamentals.
14 Totals from Cut Flower & Cut Foliage and Nursery Products.
* Adjusted figure to include Propagative Materials and Woody Ornamentals

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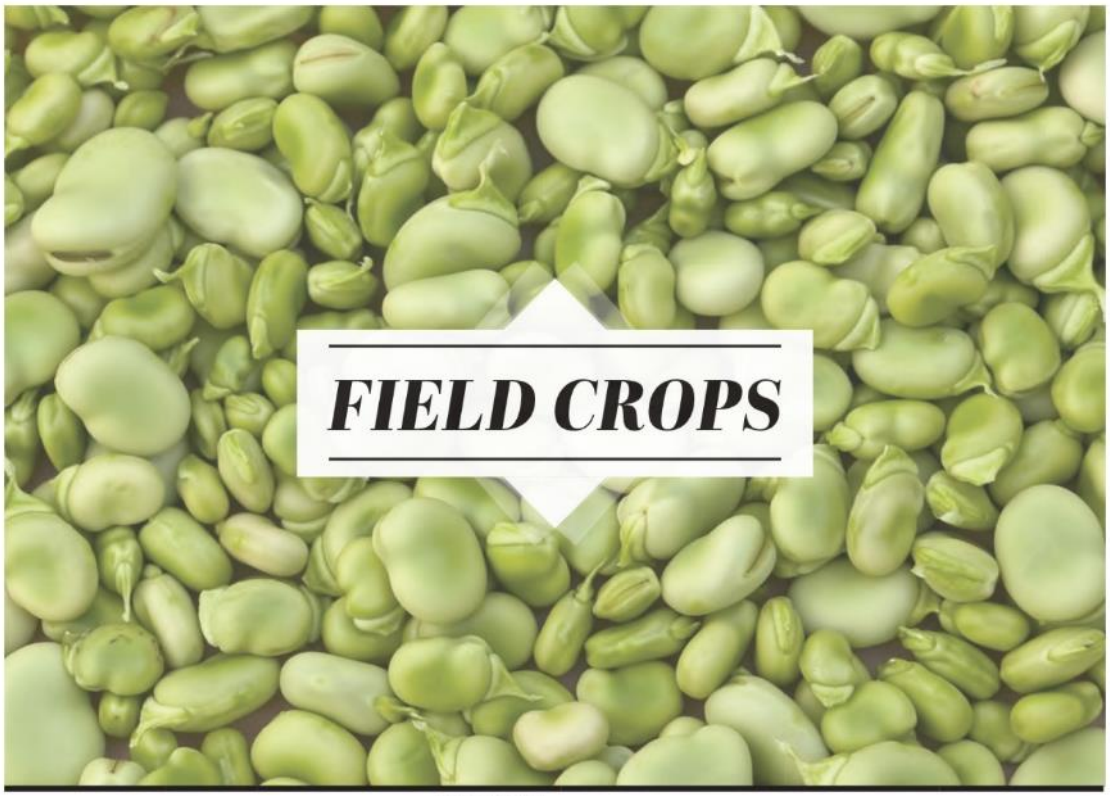
CELEBRATING *Maria Carmen Santoyo*

Maria Carmen Santoyo has been involved in Monterey County agriculture for approximately 25 years. In her first job as a fieldworker in the strawberry fields, she harvested strawberries and conducted quality checks. The job enabled her to also spend quality time with her children when they were younger. Maria says, "pushing my kids ahead in life has been my biggest influence," but balancing her job and family also comes with challenges and sacrifices. Now she works in the cauliflower fields bagging the cauliflower heads and packing them in boxes and continues to love working outdoors. During the season, she works six days a week, but that varies depending on packing request of the company that day. She encourages other women starting their career in agriculture to learn the English language, as she did. Maria sees learning English as a path to greater opportunities in agriculture for field workers and their families.

CELEBRATING *Leticia Hernandez*

Six years ago, Leticia Hernandez was a stay at home mom who developed a knack for gardening as a way to pass the time while her kids napped. She had no formal training, degrees or certifications in agriculture, but that didn't stop her from organizing volunteers to build a community garden. Perseverance led her to taking on the role of FARMS Leadership Program Coordinator. Leticia's typical day involves outreach to partners in the industry, planning field days for high school students and creating the agendas to provoke intelligent conversations. "I try to inspire, educate and cultivate future generations of farmers, agriculture leaders and natural resource stewards," she says. Leticia recommends women building a career find a mentor and dress for the job you want. "I am a native Monterey County resident and I didn't choose agriculture it chose me. I am very blessed to do something I love in a place that I love," she says.

"I AM A NATIVE MONTEREY COUNTY RESIDENT AND I DIDN'T CHOOSE AGRICULTURE IT CHOSE ME. I AM VERY BLESSED TO DO SOMETHING I LOVE IN A PLACE THAT I LOVE."



FIELD CROPS

CROP	YEAR	ACREAGE	PRODUCTION PER ACRE	TOTAL	UNIT	VALUE PER UNIT	TOTAL
Barley, Grain	2018	4,482	0.96	4,300	ton	$143.00	$615,000
	2017	3,792	0.94	3,560	ton	$145.00	$516,000
Bean[15]	2018	822	1.52	1,250	ton	$2,100.00	$2,625,000
	2017	425	1.70	723	ton	$1,880.00	$1,359,000
Hay, Alfalfa	2018	1,284	4.75	6,100	ton	$110.00	$671,000
	2017	277	5.23	1,450	ton	$196.00	$284,000
Misc. Field Crops[16]	2018	2,110	—	—		—	$507,000
	2017	812	—	—		—	$196,000
Oat[17]	2018	465	1.75	814	ton	$110.00	$89,500
	2017	451	1.86	839	ton	$120.00	$101,000
Rangeland	2018	1,063,918	—	—	acre	$18.00	$19,151,000
	2017	1,062,686	—	—	acre	$18.00	$19,128,000
Wheat, Grain	2018	420	1.12	470	ton	$190.00	$89,300
	2017	840	0.83	697	ton	$130.00	$90,600
FIELD CROPS TOTAL	**2018**	**1,073,501**					**$23,748,000**
	2017	**1,069,283**					**$21,675,000**

15 Includes: Peruano, Pintos, Pink, Pinquito and Lima Beans
16 Includes: Pastureland and Safflower
17 Includes: Hay Oats and Misc. Oats.

LIVESTOCK & POULTRY

CROP	YEAR	HEAD	PRODUCTION	UNIT	VALUE PER UNIT	TOTAL
Cattle & Calves	2018	25,100	177,000	cwt*	$136.00	$24,072,000
	2017	25,500	179,000	cwt	$125.00	$22,375,000
Stocker	2018	60,500	427,000	cwt	$137.00	$58,499,000
	2017	56,300	398,000	cwt	$134.00	$53,332,000
Sheep & Lambs	2018	1,210	1,500	cwt	$166.00	$249,000
	2017	1,100	1,500	cwt	$131.00	$197,000
Hogs	2018	1,650	446,000	lbs	$0.65	$290,000
	2017	1,600	432,000	lbs	$0.70	$303,000
Misc. Livestock[18] & Poultry[19] Products	2018	—	—	—	—	$27,488,000
	2017	—	—	—	—	$25,207,000
LIVESTOCK & POULTRY TOTAL	**2018**					**$110,598,000**
	2017					**$101,414,000**

18 Includes: Bulls, Cull Cows, Dairy Cows, Milk Manufacturing and Market Milk.
19 Includes: Eggs, Hatcheries and Poultry.
*Hundredweight (100 pounds)

CELEBRATING

Janet Louie

Spending days after school grading, bunching and tending to the flowers is a huge part of Janet's childhood. Her strong Japanese upbringing has instilled dedication to family, a hard work ethic and determination. After teaching English in Japan for two years after college, she moved back to Monterey County to assist her parents with the family flower farm, Green Valley Floral. Janet and her husband, Curtis, now run the family business. She manages sales and human resources for one of only a few cut flower greenhouses specializing in cut roses left in the United States. "Agriculture always involves risk but if you work hard, you get results", Janet says of the decisions made to innovate and improve technology within their business. Agriculture is unique and involves hard work but can be rewarding if you enjoy what you do. Visiting the greenhouses and checking on the quality and color of the blooms gives her the opportunity to stop and smell the roses.

> ***"AGRICULTURE ALWAYS INVOLVES RISK BUT IF YOU WORK HARD, YOU GET RESULTS."***

CELEBRATING

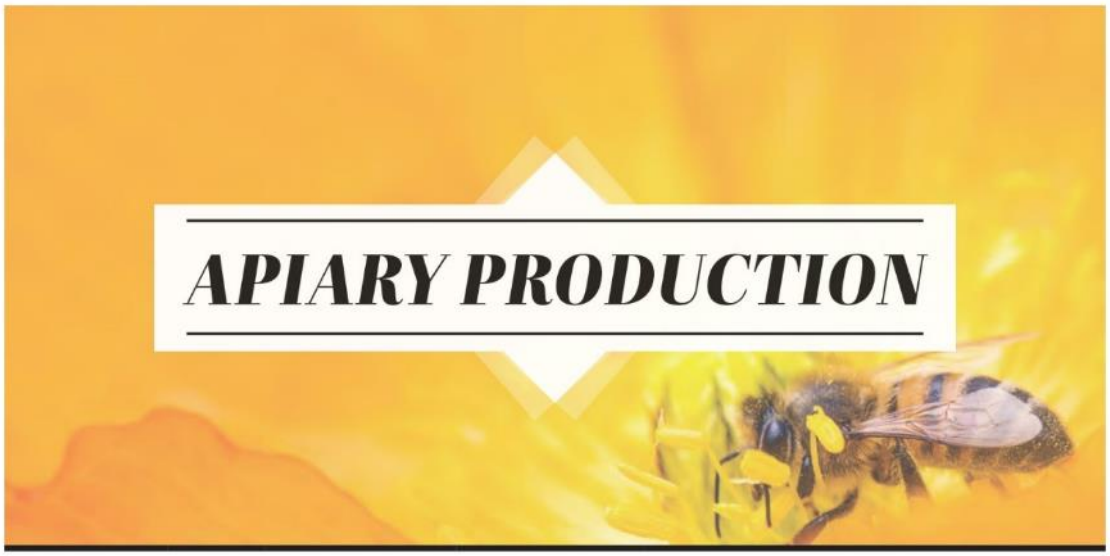
Margaret Duflock

Margaret's favorite thing about agriculture is that people are authentic, genuine and supportive. She would know well because she is carrying on a legacy in the cattle business started by her great grandfather in 1871. Margaret grew up on San Bernardo Rancho with a strong role model of strength—her mother—who balanced involvement in the ranch with an ability to maintain a loving family. Through the years Margaret has sat on numerous boards and has been involved in the agriculture community, including as the first woman president of the Monterey County Cattlemen's Association. She sees the opportunity for more women to get involved with agricultural policy and preserve farming and grazing land of Monterey County by educating people on where their food comes from. Margaret advises women thinking about getting involved with agriculture or currently involved, "stay strong and stand firm on what you believe in."

SUMMARY OF PEST MANAGEMENT

Pest Management and Eradication is the concerted effort to abate incipient and established infestations of biologically or economically important pests. 2,407 gross acres were surveyed for Fertile Capeweed and mapped. A community effort to reduce French Broom was aided with complementary manual removal on adjacent rights of way. 881 gross acres of Yellow Star Thistle infested rights of way were managed in South Monterey County. 1,094 gross acres were surveyed for Scotch Thistle. The Monterey County Weed Management Area had one group meeting, visited the Capitol to advocate for invasive species awareness and funding, and organized a plenary session for the California Invasive Plant Council's annual symposium.

ACTIVITY	CONTROL MECHANISM	SCOPE OF PROGRAM
COUNTY BIOLOGICAL CONTROL		
Yellow Starthistle, *Centaurea solstitialis*	Seedhead Weevils/Fly, *Bangasternus orientalis, Eustenopus villosus, Urophora sirunaseva, Larinus curtus*	47 sites
Italian Thistle, *Carduus spp.*	Seedhead weevil, *Rhinocyllus conicus*	General Distribution
Russian Thistle, *Salsola australis*	Leaf & stem mining moths, *Coleophora spp.*	General Distribution
Puncture Vine, *Tribulus terrestris*	Stem & Seed weevils, and *Microlarinus spp.*	General and Local Distribution
Ash Whitefly, *Siphoninus phillyreae*	Parasitic wasp, *Encarsia inaron*	General Distribution
PEST ERADICATION		
Scotch Thistle, *Onopordum acanthium*	Mechanical/Chemical	One Infestation
Skeletonweed, *Chrondrilla junceae*	Mechanical/Chemical	One Infestation
Puna Grass, *Achnatherum brachychaetum*	Mechanical/Chemical	Nine Infestations
Hydrilla, *Hydrilla verticillata*	Mechanical/Chemical	Eradicated
Biddy-biddy, *Acaena novae-zelandiae*	Mechanical/Chemical	Eradicated
PEST MANAGEMENT		
Portuguese Broom, French Broom	Manual	One Site, Two Sites
Roadside, Targeted Noxious Weeds	Chemical	County right-of-ways, spot treatment
Lettuce Mosaic Virus	Virus-Free Seed	Indexing of all county-planted seed
Lettuce Mosaic Virus	Host-Free Period	No lettuce above ground during Dec. 7-21
Celery Mosaic Virus	Host-Free Period	No celery above ground in January
Lettuce Root Aphid	Host-Free District	Lombardy poplar prohibition



APIARY PRODUCTION

CROP	YEAR	COLONIES	PRODUCTION	UNIT	VALUE PER UNIT	TOTAL
Honey	2018	—	8,500	lbs	$2.12	$18,000
	2017	—	7,800	lbs	$2.09	$16,300
Pollination[20]	2018	3,370	—	colony	$69.60	$235,000
	2017	2,490	—	colony	$65.00	$162,000
Wax	2018	—	350	lbs	$4.50	$1,580
	2017	—	330	lbs	$4.50	$1,490
APIARY PRODUCTION **TOTAL**	**2018**					**$255,000**
	2017					**$180,000**

SEED PRODUCTION

CROP	YEAR	ACREAGE	PRODUCTION PER ACRE	TOTAL	UNIT	VALUE PER UNIT	TOTAL
Bean Seed	2018	509	1.17	596	ton	$3,240.00	$1,931,000
	2017	660	1.01	667	ton	$3,280.00	$2,188,000
Misc. Seed[21]	2018	984	0.98	964	ton	$2,960.00	$2,853,000
	2017	1,080	1.00	1,080	ton	$2,720.00	$2,938,000
SEED PRODUCTION **TOTAL**	**2018**	**1,493**					**$4,784,000**
	2017	**1,740**					**$5,126,000**

20 Seed Crops Pollination Services
21 Includes: Barley, Broccoli, Cauliflower, Corn, Cucumber, Pea and Sunflower Seeds

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WINE GRAPE PRODUCTION

WHITE GRAPE VARIETIES	HARVESTED ACRES	AVERAGE PRICE PER TON	TOTAL TONS	TOTAL VALUE
Chardonnay	17,006	$1,290	64,700	$81,522,000
Pinot Gris	1,263	$1,210	5,870	$6,994,000
Sauvignon Blanc	1,028	$1,200	5,360	$6,432,000
Gewurztraminer	887	$673	6,940	$4,368,000
Riesling	1,523	$863	4,670	$4,030,000
Muscat Blanc	159	$1,190	611	$727,000
Pinot Blanc	101	$1,260	544	$685,000
Malvasia Bianca	116	$1,130	487	$550,000
Albarino	34	$1,440	280	$403,000
Gruner Veltliner	104	$1,230	267	$328,000
Chenin Blanc	127	$1,280	158	$202,000
Viognier	112	$1,710	56	$95,800
Other Whites[22]	98	$1,430	178	$255,000
SUBTOTAL WHITE GRAPE	**22,558**		**90,100**	**$108,945,000**

RED GRAPE VARIETIES	HARVESTED ACRES	AVERAGE PRICE PER TON	TOTAL TONS	TOTAL VALUE
Pinot Noir	10,118	$1,880	47,200	$88,736,000
Cabernet Sauvignon	4,813	$1,310	17,900	$23,449,000
Merlot	4,423	$894	11,900	$10,639,000
Syrah	1,233	$1,270	3,930	$4,991,000
Grenache	314	$1,290	2,740	$3,535,000
Malbec	296	$1,220	2,030	$2,477,000
Petite Sirah	339	$1,350	1,390	$1,877,000
Petit Verdot	199	$1,390	468	$651,000
Zinfandel	148	$1,020	451	$460,000
Gamay Valdiguie	38	$1,020	401	$409,000
Cabernet Franc	116	$1,270	301	$382,000
Tannat	35	$1,280	226	$289,000
Other Reds[23]	294	$1,370	670	$918,000
SUBTOTAL RED GRAPE	**22,366**		**89,600**	**$138,813,000**

22 Grenache Blanc, Marsanne, Roussanne, Sauvignon Musque, Semillon, and Vermentino.
23 Barbera, Carignane, Cinsaut, Dolcetto, Dornfelder, Mouvedre, Primitivo, Sangiovese, Souzao, and Tempranillo.

WINE GRAPE TRENDS

YEAR	NONBEARING ACRES	BEARING ACRES	TOTAL TONS	VALUE
2018	1,137	44,924	180,000	$247,758,000
2017	896	44,299	171,000	$239,027,000
2016	1,496	44,771	172,000	$238,892,000
2015	2,549	44,296	140,300	$185,925,000
2014	2,512	45,993	200,000	$247,357,000
2013	1,531	42,986	185,000	$226,982,000
2012	1,936	45,130	172,000	$214,306,000
2011	2,006	43,034	124,000	$140,976,000
2010	2,572	43,321	177,000	$172,916,000
2009	3,975	40,792	204,000	$238,082,000
2008	4,006	40,144	201,000	$238,366,000

"I SEE THE OPPORTUNITY FOR MORE WOMEN TO GET INVOLVED WITH AGRICULTURAL POLICY AND PRESERVE FARMING AND GRAZING LAND OF MONTEREY COUNTY BY EDUCATING PEOPLE ON WHERE THEIR FOOD COMES FROM."

Margaret Duflock

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ORGANIC PRODUCTION

YEAR	PRODUCERS	ACRES	GROSS SALES
2018	185	68,868	$412,347,000
2017	222	40,859	$390,295,000
2016	179	32,947	$365,199,000
2015	178	30,413	$335,090,000
2014	158	28,270	$277,294,000
2013	131	33,381	$214,437,000
2012	131	22,288	$182,657,000

SUMMARY OF PEST DETECTION & EXCLUSION ACTIVITIES

Pest Detection is the systematic search for detrimental pests throughout the county by means of trapping, luring and surveying. The goal is to detect novel pests before they become established so that eradication is biologically and economically feasible. Detection trapping is performed primarily by the County Agricultural Commissioner's offices. Targeted pests include Asian Citrus Psyllid, Glassy Winged Sharp Shooter, Gypsy Moth, and Japanese Beetle.

Pest Exclusion is the process of monitoring the channels of trade through routine inspections and commodity certification to prevent the transport and introduction of economically important pests and pathogens. Phytosanitary field inspections for seed diseases accounted for 1,274 hours, with a total of 378 inspections being completed on 1,446 acres. Special surveys were made for Phytophthora ramorum (Sudden Oak Death) in nurseries. A total of 423 pest exclusion inspections at parcel terminals for incoming plant shipments occurred in 2018, with one rejection issued. Another 528 inspections of incoming plant material were performed for in state and out of state shipments. 1,523 inspections were completed under the Glassy Winged Sharp Shooter Program on incoming nursery stock shipments originating from regulated areas and no viable life stages were detected.

PEST TRAPPING

TARGET PEST	INSECT HOSTS	TRAPS PLACED	SERVICINGS
Medfly	Fruit Trees	238	3,212
Melon Fruit Fly	Vegetable Gardens	87	810
Mexican Fruit Fly	Fruit Trees	114	2,487
Oriental Fruit Fly	Fruit Trees	238	3,212
Misc. Fruit Fly	Fruits and Vegetables	87	808
Gypsy Moth	Shade Trees	208	921
Japanese Beetle	Turf, Rose	225	1,117
Trogoderma Beetle	High Hazard Commodities	20	240
Light Brown Apple Moth	Ornamental/Commercial Crops	323	2,418
European Grapevine Moth	Grapes	2,646	26,102
Asian Citrus Psyllid - Urban/Commercial	Citrus	462	7,229
Glassy Winged Sharpshooters	Nurseries/Urban Areas	594	7,128
TOTAL TRAPPING PROGRAM ACTIVITIES		**5,242**	**55,684**

EXPORTS BY COMMODITY

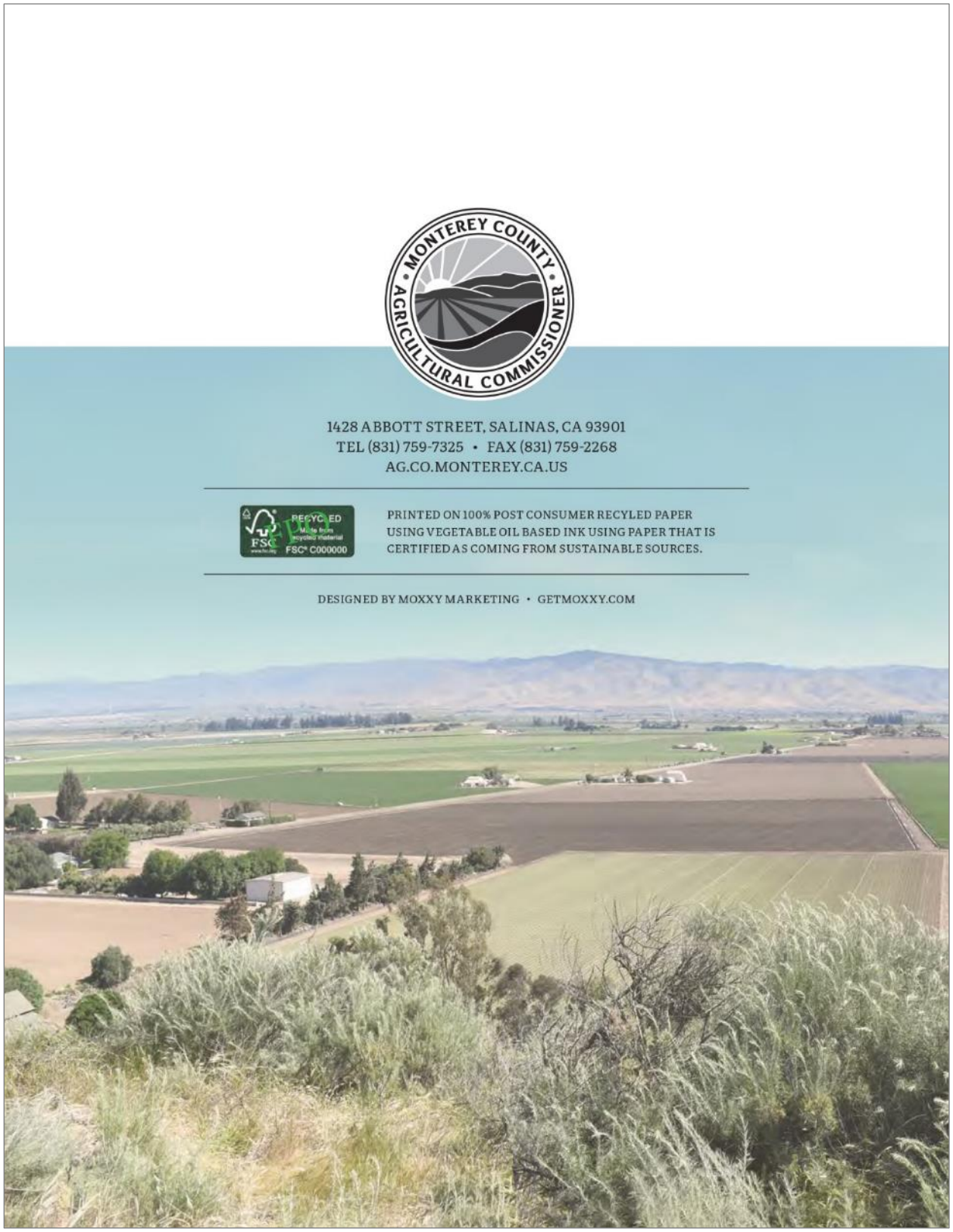
COMMODITY	2018 TOTAL POUNDS
Lettuce	128,261,000
Strawberry	121,542,000
Celery	45,599,000
Broccoli	40,738,000
Cauliflower	27,648,000
Raspberry	5,595,000
Carrot	5,648,000
Radicchio	3,262,000
Spinach	3,012,000
Blackberry	2,865,000
Cabbage	2,438,000
Brussels Sprout	1,882,000
Other	10,495,000
TOTAL	**398,985,000**

COMMODITY	2017 TOTAL POUNDS
Lettuce	172,661,000
Strawberry	88,461,000
Broccoli	41,558,000
Cauliflower	28,014,000
Celery	27,504,000
Raspberry	16,180,000
Blackberry	8,887,000
Broccoli Rabe	7,719,000
Fennel	6,685,000
Radicchio	4,159,000
Carrot	3,140,000
Spinach	2,650,000
Other	16,442,000
TOTAL	**424,060,000**

EXPORTS BY TRADE PARTNERS

COUNTRY	2018 TOTAL POUNDS
Canada	169,958,000
Taiwan	78,856,000
Mexico	73,637,000
Japan	37,866,000
Hong Kong	16,320,000
Saudi Arabia	6,106,000
Singapore	4,057,000
European Union	3,282,000
United Arab Emirates	3,088,000
Panama	1,281,000
Puerto Rico	1,209,000
Kuwait	1,075,000
Qatar	594,000

COUNTRY	2017 TOTAL POUNDS
Canada	222,177,000
Taiwan	90,719,000
Mexico	50,845,000
Japan	34,255,000
Puerto Rico	15,809,000
Saudi Arabia	7,195,000
Korea, Republic of	4,197,000
United Arab Emirates	3,362,000
Singapore	2,607,000
European Union	2,228,000
Hong Kong	1,327,000
Kuwait	1,274,000
Panama	813,000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AGRICULTURAL COMMISSIONER
1428 ABBOTT STREET, SALINAS, CA 93901
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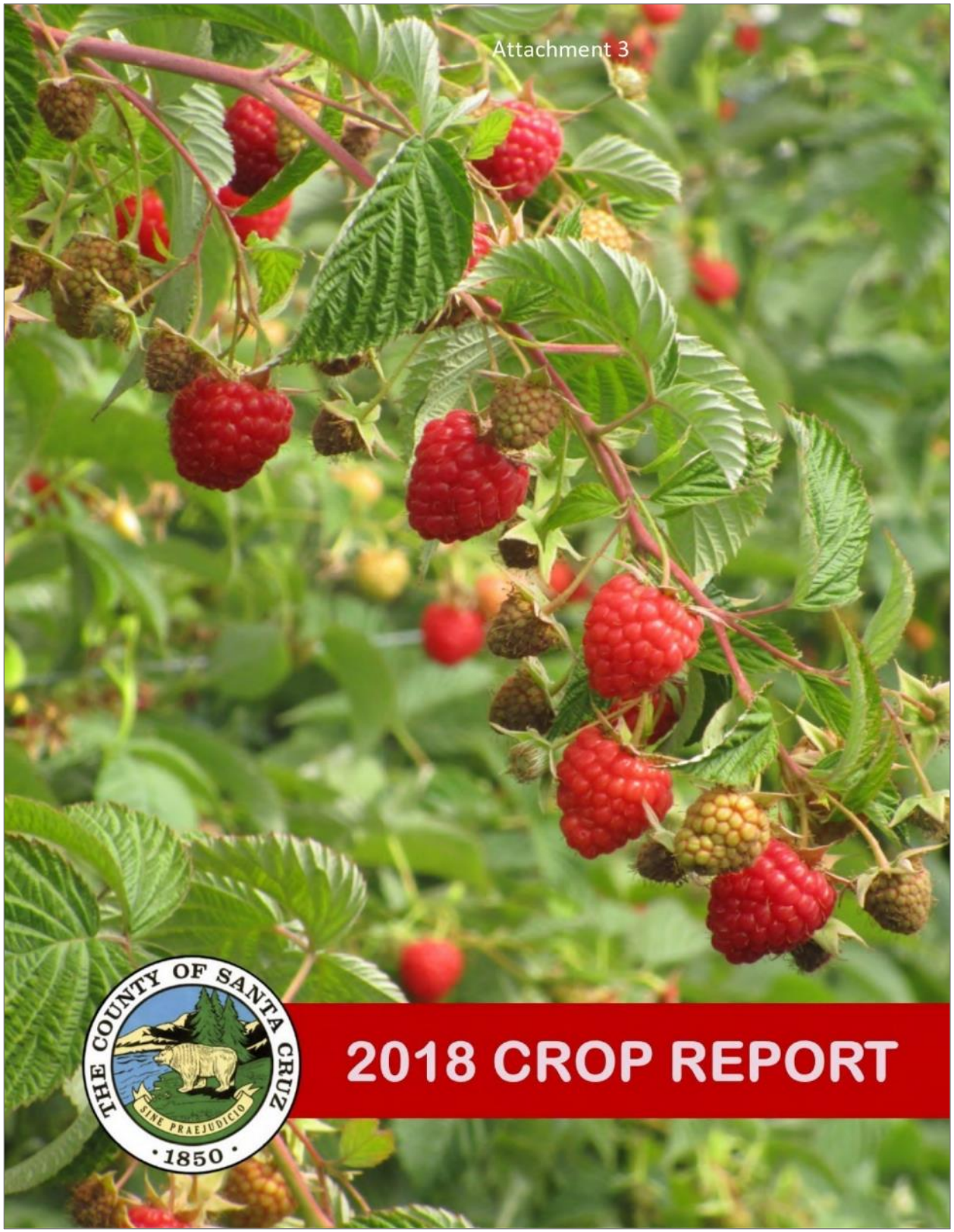
Attachment 3
THE COUNTY OF SANTA CRUZ
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1850
2018 CROP REPORT

COUNTY OF SANTA CRUZ

OFFICE OF THE AGRICULTURAL COMMISSIONER

JUAN HIDALGO
AGRICULTURAL COMMISSIONER
SEALER OF WEIGHTS AND MEASURES
DIRECTOR, MOSQUITO AND VECTOR CONTROL

Karen Ross, Secretary, California Department of Food and Agriculture
And
The Honorable Board of Supervisors of the County of Santa Cruz

Ryan Coonerty,	3rd District
John Leopold,	1st District
Zach Friend,	2nd District
Greg Caput,	4th District
Bruce McPherson,	5th District

In accordance with the provisions of Section 2279 of the California Food and Agricultural Code, I am pleased to present the 2018 Crop Report for Santa Cruz County. The report represents estimated acreage, yield and gross values of agricultural products produced in Santa Cruz County.

The total gross production value of Santa Cruz County agricultural commodities for 2018 is $683,012,000. This represents an increase of 17 percent, or $101,812,000 above the 2017 production value of $581,200,000. Gross production yield and value is influenced by factors such as weather, labor and the marketplace.

It is important to emphasize that figures presented in this report are gross values and do not include costs incurred by growers that include but are not limited to labor, land preparation, irrigation, pest management, transportation, cooling, marketing, equipment, assessments, regulatory costs or loss experienced by individual operations. Also, the figures do not reflect the total contribution of agriculture to the economy of Santa Cruz County. Farm employment and other farm-related services add significant value and benefits to the local economy.

Strawberries remain the number one crop in Santa Cruz County with an estimated value of $220,653,000 on approximately 2,578 planted acres. It is important to note that although the total gross value for strawberries increased from the previous year due to high production yields, 2018 proved to be one of the most challenging years for our growers due to historically low prices that persisted throughout the growing season. Raspberries remain the number two crop with an estimated value of $168,465,000, the highest value yet reported in our County for this very popular fruit. Berries (strawberries, raspberries and blackberries) saw an overall increase in gross value of 17 percent, or $63,380,000 compared to 2017 for a total value of $434,331,000.

Vegetable production remained strong in Santa Cruz County with an overall value of $92,458,000, a slight increase over the 2017 production value of $91,511,000. Nursery crops had an overall strong year with a total value of $109,819,000. This is an increase of 30% over the 2017 production value of $84,375,000. Nursery stock, a category of nursery crops, saw an increase in production acres, and thanks to customer interest and demand for new plant varieties this resulted in a production value of $83,204,000 for 2018. Cut flowers and cut greens saw a decrease in value of 32%, or $12,904,000 from the previous year for a total of $26,615,000 for 2018. Much of the decrease in value can be attributed to competition from abroad and diversification to other commodities.

I would like to express my sincere appreciation to all the farmers, ranchers, boards, commissions, packinghouses and agencies who contributed vital data without which this report would not be possible, and many thanks to my staff for their dedication to compiling and producing the 2018 Santa Cruz County Crop Report.

Respectfully submitted,

Juan Hidalgo
Agricultural Commissioner

175 WESTRIDGE DRIVE, WATSONVILLE, CALIFORNIA 95076 TELEPHONE (831) 763-8080 FAX (831) 763-8255

SANTA CRUZ COUNTY
AGRICULTURAL COMMISSIONER
SEALER OF WEIGHTS AND MEASURES
DIRECTOR OF MOSQUITO and VECTOR CONTROL

STAFF

Agricultural Commissioner, Sealer of Weights and Measures
Director of Mosquito and Vector Control
Juan Hidalgo

Deputy Agricultural Commissioners
Pamela Cassar David Sanford

Assistant Vector Control Manager
Paul Binding

Agricultural / Weights and Measures Inspectors
Gabriel Chan Walter Mayeda
Benito Mendoza II Andrew Kimura
Shane DeVine Peter Parker
David George Renee Inlow
Alberto Vinuela Teresa Sullivan

Agricultural Biologist Aide
Raymond Schmidt Martina Axner
Gabriel Alvarado Samuel Estrada
Kristian Flores Rudy Ruelas
Douglas Guthrie Kevin Neimeyer
Jose Rojas Marvin Henderson

Vector Ecologist
Amanda Poulsen

Vector Control Specialists
Melanie Benedetti Nader Sidhom
Steve Driscoll Ray Travers
Stephen Bowling

Administrative Support Staff
Mark Huett, Sr. Accounting Technician
Rafaela Hoessel, Sr. Account Clerk
Rosemary Velez, Receptionist

Photo Cover by A.Vinuela

This year's Crop Report is dedicated to Melanie Benedetti (1974-2019)

On July 26, 2019, our department lost a dear friend and colleague. After graduating from UC Santa Barbara, Melanie started her career with the County in 1998, working in the commodity inspection and pest detection programs in the Agricultural Commissioner's Office. In 2006, she was promoted to the Mosquito and Vector Control Division (MVC) as Vector Control Specialist, applying her skills and knowledge of science to the effort of protecting County residents from vectors capable of transmitting disease. She contributed significantly to the success of MVC over the years, working in mosquito abatement, yellowjacket control, tick monitoring, rodent inspections and public education and outreach. Melanie loved living and working in Santa Cruz County, and her dedication and cheerfulness endeared her to her co-workers and the public alike. Her commitment to our department and to the County will always be appreciated, and she is greatly missed by all who knew her.

SANTA CRUZ COUNTY

FRUIT CROPS

CROP	YEAR	ACRES	PRODUCTION (TONS PER ACRE)	TOTAL PRODUCTION (TONS)	PRICE (PER TON)	TOTAL VALUE
STRAWBERRIES	**2018**	**2,578**	**50.33**	**129,761**	**$1,700**	**$220,653,000**
	2017	2,602	41.16	107,098	$1,972	$211,196,000
RASPBERRIES	**2018**	**2,314**	**9.78**	**22,631**	**$7,444**	**$168,465,000**
	2017	2,235	7.74	17,299	$6,424	$111,128,000
BLACKBERRIES	**2018**	**790**	**9.51**	**7,513**	**$6,018**	**$45,213,000**
	2017	898	8.92	8,008	$6,072	$48,627,000
TOTAL BERRIES	**2018**	**5,682**				**$434,331,000**
	2017	5,735				$370,951,000

APPLES, FRESH AND PROCESSED	**2018**	**2,027**	**32.31**	**65,492**	**$362**	**$23,705,000**
	2017	2,027	19.72	39,972	$341	$13,631,000
WINE GRAPES	**2018**	**630**	**2.27**	**1,432**	**$2,930**	**$4,197,000**
	2017	638	2.35	1,500	$3,226	$4,840,000
TOTAL APPLE, WINE AND MISC. FRUIT*	**2018**	**2,926**				**$28,058,000**
	2017	2,921				$19,147,000

*The total acres and value figures include the categories miscellaneous berries, tree and vine fruit, which were reported in a separate category in previous reports. Miscellaneous berries, tree and vine fruit includes boysenberries, blueberries, olallieberries, apricots, avocados, figs, kiwifruit, lemons, olives, peaches, pears, plums, persimmons, pomegranates, prunes and walnuts.

SANTA CRUZ COUNTY

VEGETABLE CROPS

CROP	YEAR	ACRES	PRODUCTION (TONS PER ACRE)	TOTAL PRODUCTION (TONS)	PRICE (PER TON)	TOTAL VALUE
BRUSSELS SPROUTS	**2018**	**990**	**11.22**	**11,108**	**$1,103**	**$12,252,000**
	2017	1,167	11.75	13,712	$1,416	$19,417,000
LETTUCE, HEAD	**2018**	**1,701**	**21.15**	**35,982**	**$453**	**$16,300,000**
	2017	1,447	22.95	33,193	$367	$12,182,000
LETTUCE, LEAF	**2018**	**1,718**	**16.36**	**28,100**	**$489**	**$13,747,000**
	2017	1,636	13.57	22,195	$517	$11,485,000
MISC. VEGETABLES**	**2018**	**3,218**				**$50,159,000**
	2017	2,811				$48,427,000
TOTAL VEGETABLES	**2018**	**7,627**				**$92,458,000**
	2017	7,061				$91,511,000

**Miscellaneous Vegetables includes artichokes, beans, beets, broccoli, cabbage, cauliflower, celery, chicory, collards, cucumbers, herbs, kale, leeks, mushrooms, mustard, peas, pumpkins, radicchio, spinach, squash, vegetable seed, and other vegetables.

SANTA CRUZ COUNTY

NURSERY CROPS

CROP	YEAR	ACRES	TOTAL VALUE
CUT FLOWERS & CUT GREENS*	**2018**	**320**	**$26,615,000**
	2017	313	$39,519,000
NURSERY STOCK**	**2018**	**475**	**$83,204,000**
	2017	426	$44,856,000

*Cut flowers and cut greens includes field and greenhouse production.

**Nursery stock includes the categories: Indoor Potted Plants, Landscape Plants and Other Plants. (Other plants include farm stock and Christmas trees.)

TOTAL NURSERY	**2018**	**795**	**$109,819,000**
	2017	739	$84,375,000

SANTA CRUZ COUNTY

LIVESTOCK AND ANIMAL PRODUCTS

CROP	YEAR	TOTAL VALUE
TOTAL LIVESTOCK AND PRODUCTS*	**2018**	**$8,151,000**
	2017	$8,139,000

*livestock, honey, and eggs.

Image by T. Sullivan

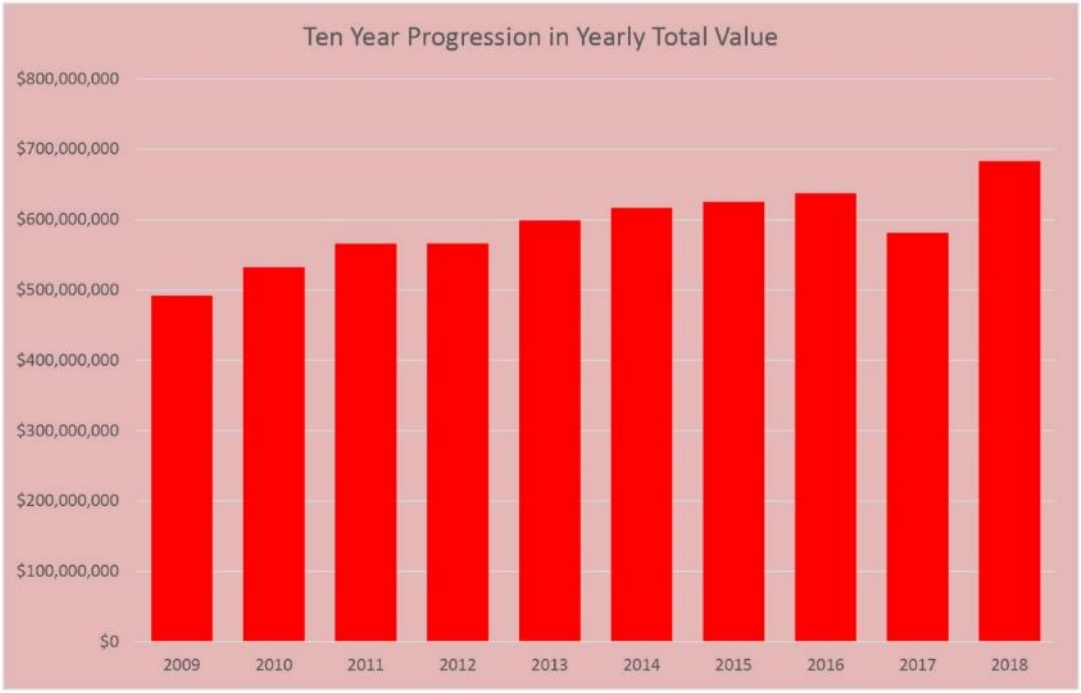
TIMBER

CROP	YEAR	PRODUCTION (MILLION BOARD FEET)	TOTAL VALUE
TIMBER	**2018**	**11,128**	**$10,195,000**
	2017	10,096	$7,077,000

SANTA CRUZ COUNTY

SUMMARY OF CROP REPORT VALUES

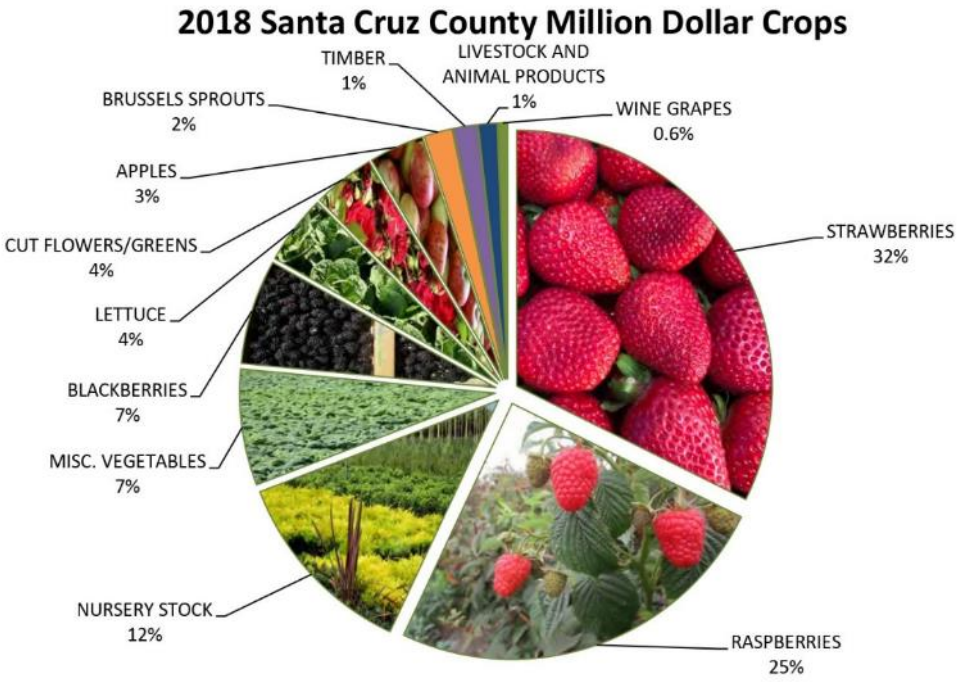
CROP	2017	2018
STRAWBERRIES, RASPBERRIES AND BLACKBERRIES	$370,951,000	**$434,331,000**
NURSERY CROPS	$84,375,000	**$109,819,000**
VEGETABLES	$91,511,000	**$92,458,000**
APPLES, WINE GRAPES AND MISC. FRUIT	$19,147,000	**$28,058,000**
TIMBER	$7,077,000	**$10,195,000**
LIVESTOCK AND ANIMAL PRODUCTS	$8,139,000	**$8,151,000**
TOTAL VALUE	$581,200,000	**$683,012,000**



SANTA CRUZ COUNTY

CROP VALUE OVERVIEW

STRAWBERRIES	$220,653,000
RASPBERRIES	$168,465,000
NURSERY STOCK	$83,204,000
MISC. VEGETABLES	$50,159,000
BLACKBERRIES	$45,213,000
LETTUCE, HEAD & LEAF	$30,047,000
CUT FLOWERS & CUT GREENS	$26,615,000
APPLES	$23,705,000
BRUSSELS SPROUTS	$12,252,000
TIMBER	$10,195,000
LIVESTOCK AND ANIMAL PRODUCTS	$8,151,000
WINE GRAPES	$4,197,000



SANTA CRUZ COUNTY

ORGANIC FARMING

There are approximately 140 registered organic growers in Santa Cruz County growing on over 4,000 acres.
The figures below represent approximate acres and values registered with the State Organic Program.

YEAR	ACRES	VALUE
2018	6,940*	$126,376,000
2017	6,702*	$109,058,000
2016	6,859*	$115,528,000
2015	6,621*	$113,585,000
2014	4,058	$118,872,000

*Includes organic pasture.

SANTA CRUZ COUNTY

EXPORT COMMODITIES OF SANTA CRUZ COUNTY

Assorted Cut Flowers
Assorted Cut Greens
Assorted Nursery Plants
Artichoke
Arugula
Basil
Bean
Beet
Bell pepper
Blackberry
Blueberry
Bok Choy
Broccoli
Brussels Sprouts
Cabbage
Carrot
Cauliflower
Celery
Chard
Cilantro
Collards
Cucumber
Dandelion
Dill
Eggplant
Endive
Escarole
Fennel
Kale
Kohlrabi
Leek
Lettuce
Mustard
Parsley
Radicchio
Radish
Raspberry
Rhubarb
Spinach
Squash
Strawberry
Tomato

EXPORT TRADE PARTNERS OF SANTA CRUZ COUNTY

Australia
Bahamas
Canada
Chile
Germany
Guatemala
Haiti
Jamaica
Japan
Mexico
Morocco
Netherlands
New Zealand
Peru
Philippines
Portugal
South Africa
Thailand
Ukraine
United Kingdom
Zambia

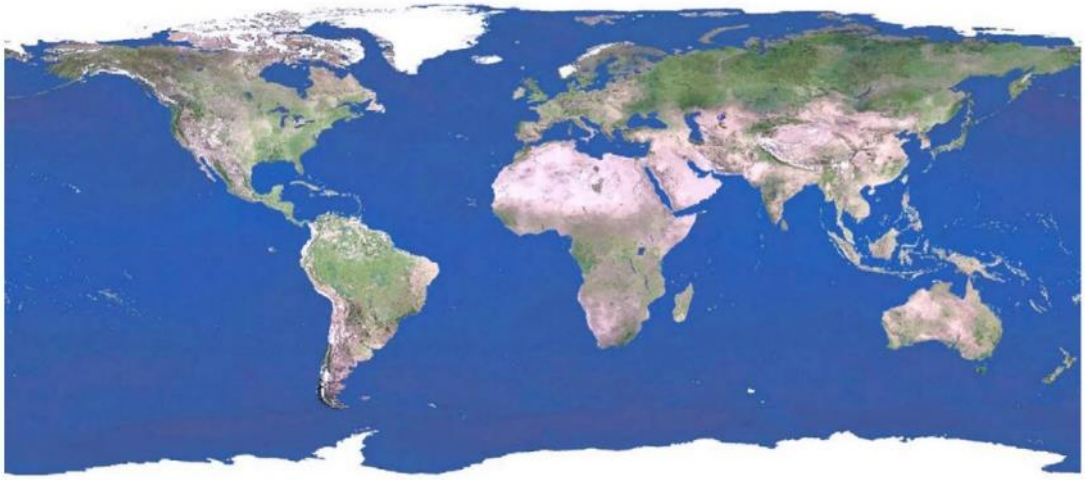
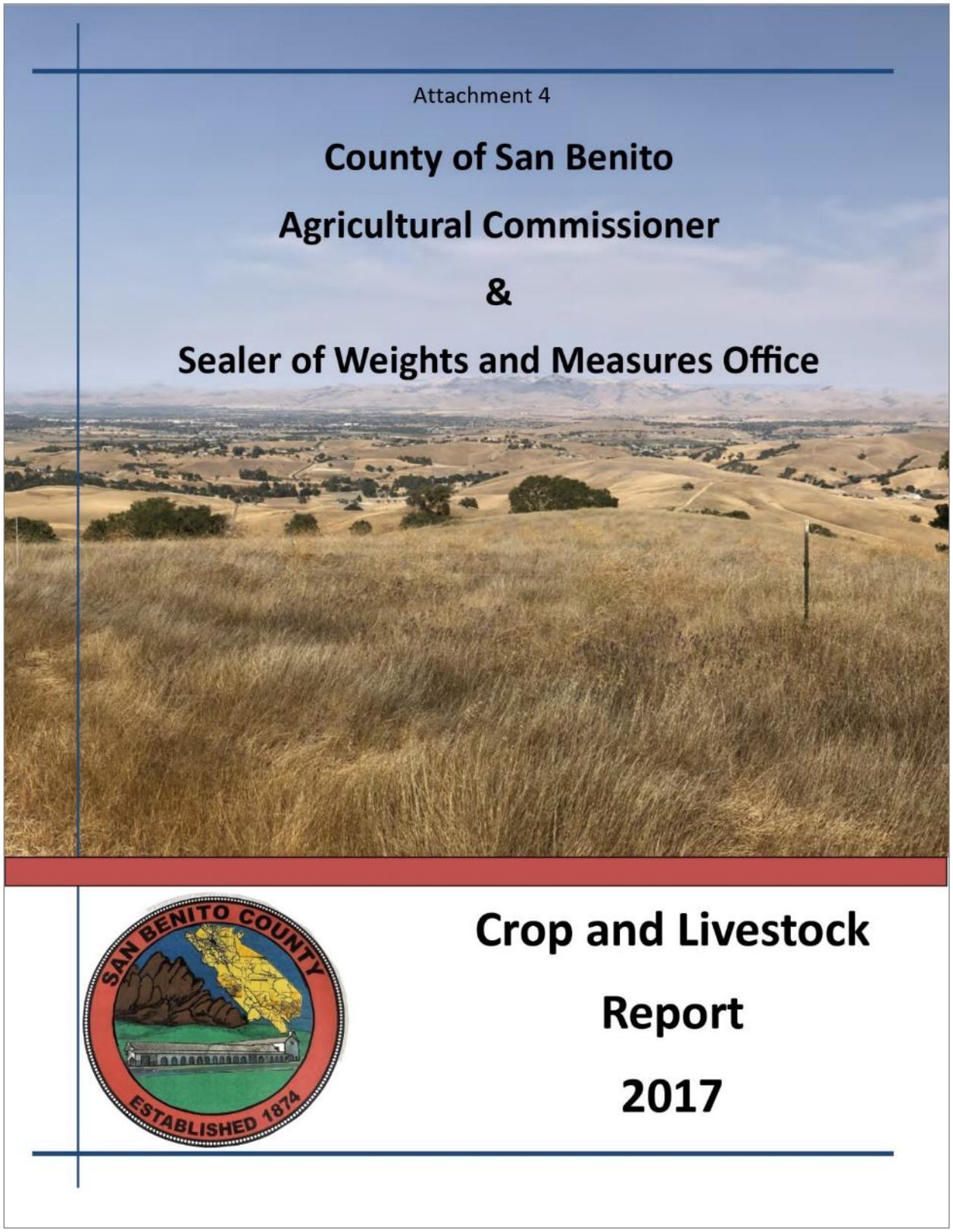
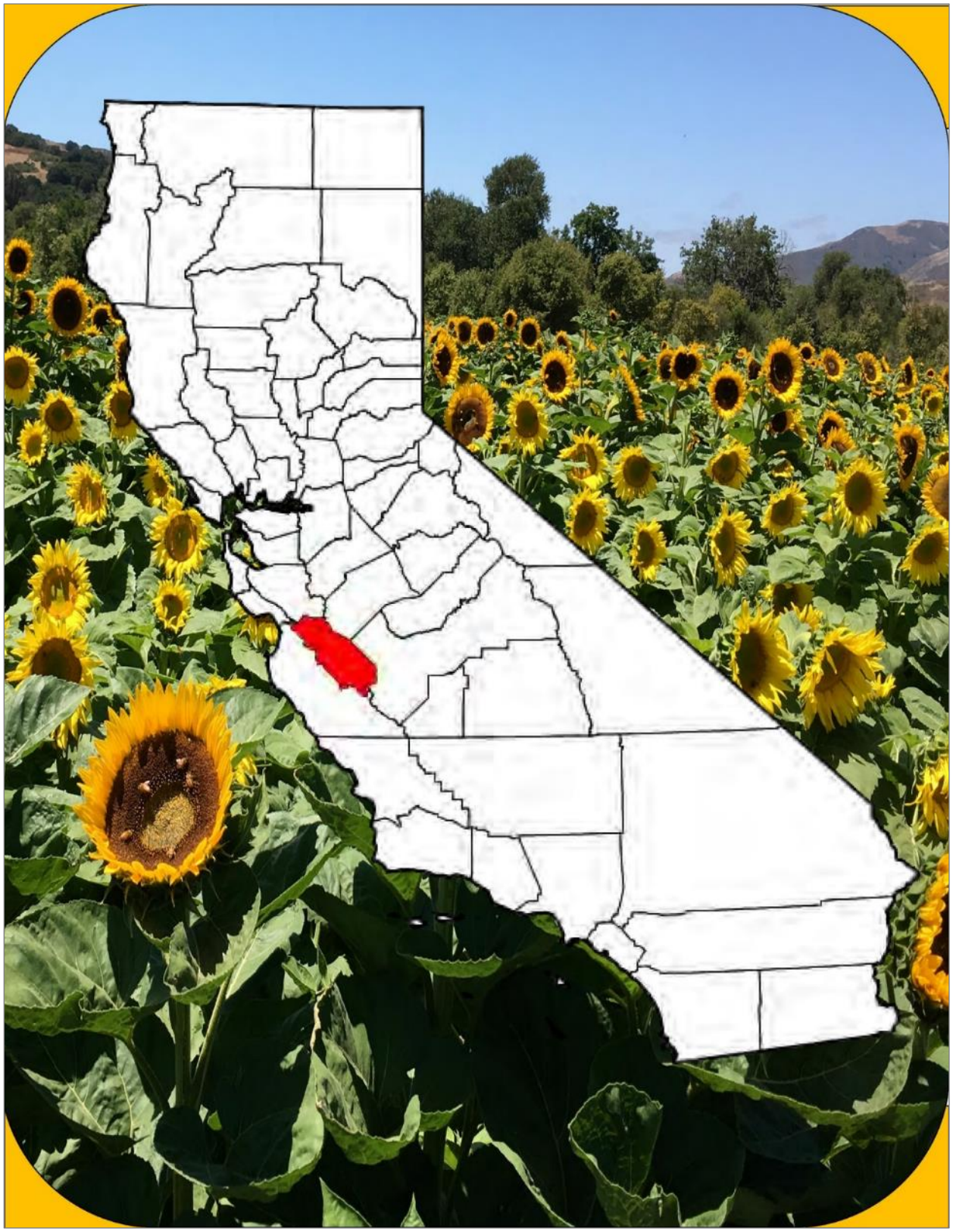


Image by NASA


Attachment 4
County of San Benito
Agricultural Commissioner
&
Sealer of Weights and Measures Office
SAN BENITO COUNTY
ESTABLISHED 1874
Crop and Livestock
Report
2017



COUNTY OF SAN BENITO

KAREN OVERSTREET AGRICULTURAL COMMISSIONER and SEALER OF WEIGHTS & MEASURES
3224 Southside Road, Hollister, CA 95023 Telephone (831) 637-5344, FAX (831) 637-9015

Karen Ross, Secretary

California Department of Food and Agriculture, and

The Honorable Board of Supervisors, and

Ray Espinosa, County Administrative Officer

In accordance with the requirements of Section 2272 and 2279 of the California Food and Agricultural Code, I hereby submit the 2017 annual crop report for San Benito County.

San Benito County continues to be one of the top five producing counties in California of specialty vegetable crops, spinach, lettuces and salad mix products. The economic impact of production agriculture to our local economy is much greater than the gross production value detailed in this report. It is a fundamental, and an often unidentified fact that agriculture provides additional value well beyond the $351 million dollars in gross product sales to San Benito County's economy.

Our agricultural industry produces a variety of commodities. Numerous specialty vegetable crops, fruits, nuts, choice beef and quality wine grapes come from this county. In 2017, the overall value of the county's agricultural decreased by 4% from 2016. 2017 saw average yields in most commodities. Spinach moved to number two in overall production value and broccoli/broccolette made the list at number seven. Both increases were primarily due to an increase in acreage. More and more ground is being committed to leafy greens and miscellaneous baby greens available to consumers in bags at the market. A lower return in many cases was seen in the boxed commodity market. Cattle prices maintained all year and were up slightly compared to 2016. Producers held onto to an average number of replacements to rebuild their herds.

2017 was a good year for tree crops as yields were up. Cherries had a good crop after enduring consecutive poor years due to weather. In general, fruit bearing trees had a great yielding year with superb size and quality. Walnut yields were consistent and the quality was slightly better yet still a little below normal. Walnut prices dropped significantly again for the third year in a row. Wine Grape yields were off slightly and prices were pretty much even. This year growers experienced a great amount pressure from the production standpoint. Labor, logistics and traffic are beginning to hinder the industry. We will learn more about these effects over the next few years to come.

These figures do not represent net profit to the producers. The figures are also periodically averaged and or rounded in the process to achieve the end value.

I wish to thank the many farmers, ranchers and businesses that have cooperated in providing the information required for the compilation of this report.

Sincerely,

Karen Overstreet

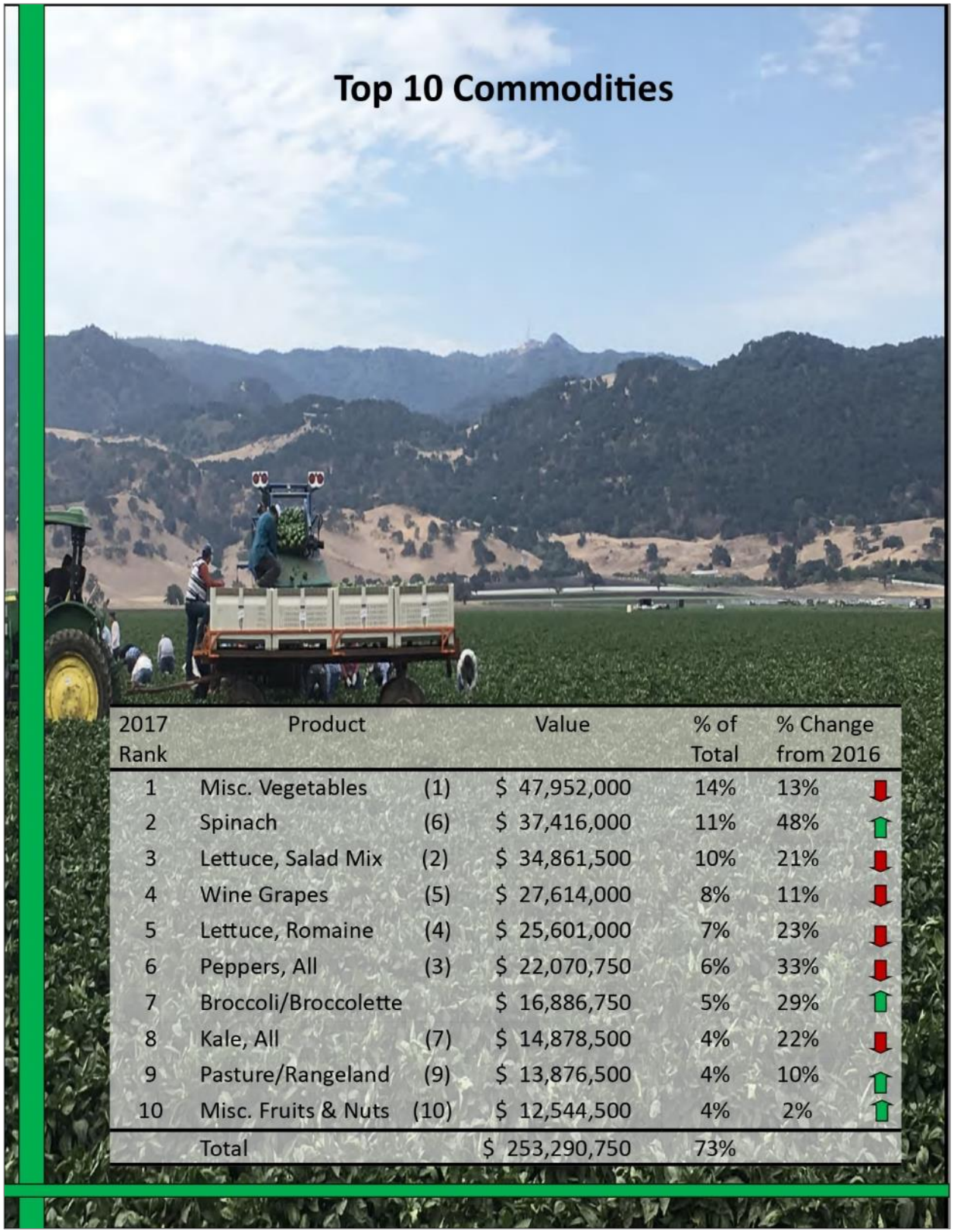
Table of Contents


County of San Benito
Agricultural Commissioner/
Sealer of Weights and Measures
County Board of Supervisors
Mark Medina, District 1
Anthony Botelho,
Chairman, District 2
Robert Rivas, District 3
Jerry Muenzer,
Vice-Chair, District 4
Jaime De La Cruz, District 5
Agricultural Commissioner/Sealer of Weights & Measures
Karen Overstreet
Deputy Ag Commissioner/Deputy Sealer of Weights & Measures
Gordon McClelland
County Administrative Officer
Ray Espinosa
Agricultural Technicians
Gabby Jimenez
Rick Perez
Elyssa Soria
Lorie Tilley
Tony Wilson
Agricultural Biologist/Inspectors
Victor Ayala
Donna Carbonaro
Ken Griffin
Rafael Martinez
Michael Silverman
Administrative Support Staff
Billie Jimenez, Secretary II

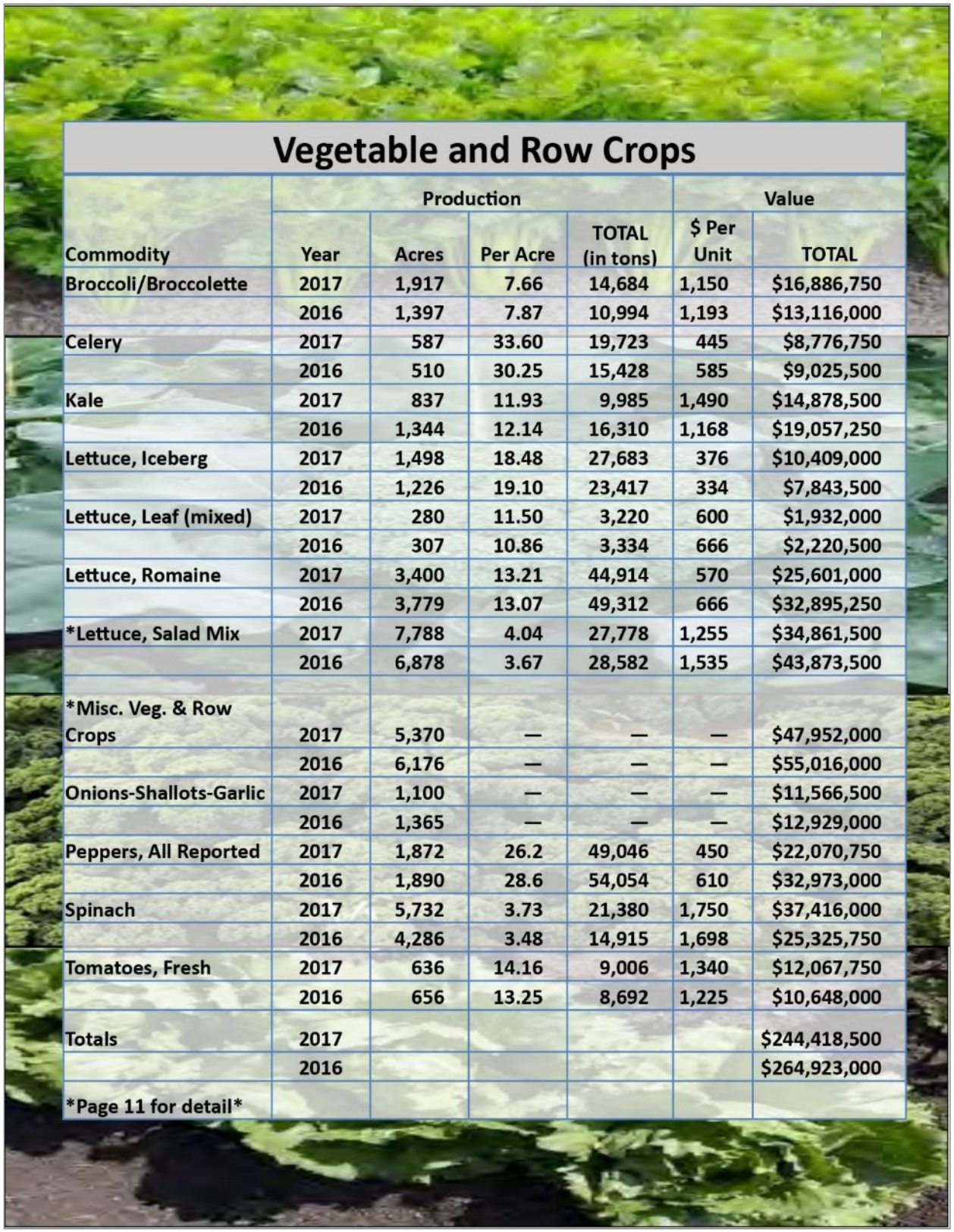
Commodity Summary

Agricultural value from San Bento County decreased by 4 percent, 13.8 million dollars in gross sales for 2017. The biggest decrease was found to have been in the vegetable and row crops production. Total commodity values for 2017 and 2016 are compared below.

	2017		2016	
Field Crops	$31,044,250	9%	$28,627,500	8%
Fruit and Nut Crops	$53,305,250	15%	$49,316,750	13%
Vegetable and Row Crop	$244,418,500	70%	$264,923,000	73%
Cattle	$21,577,750	6%	$19,670,250	5%
Other Livestock & Poultry	$995,000	—-	$2,610,000	1%
Totals	$351,340,750	100%	$365,147,500	100%

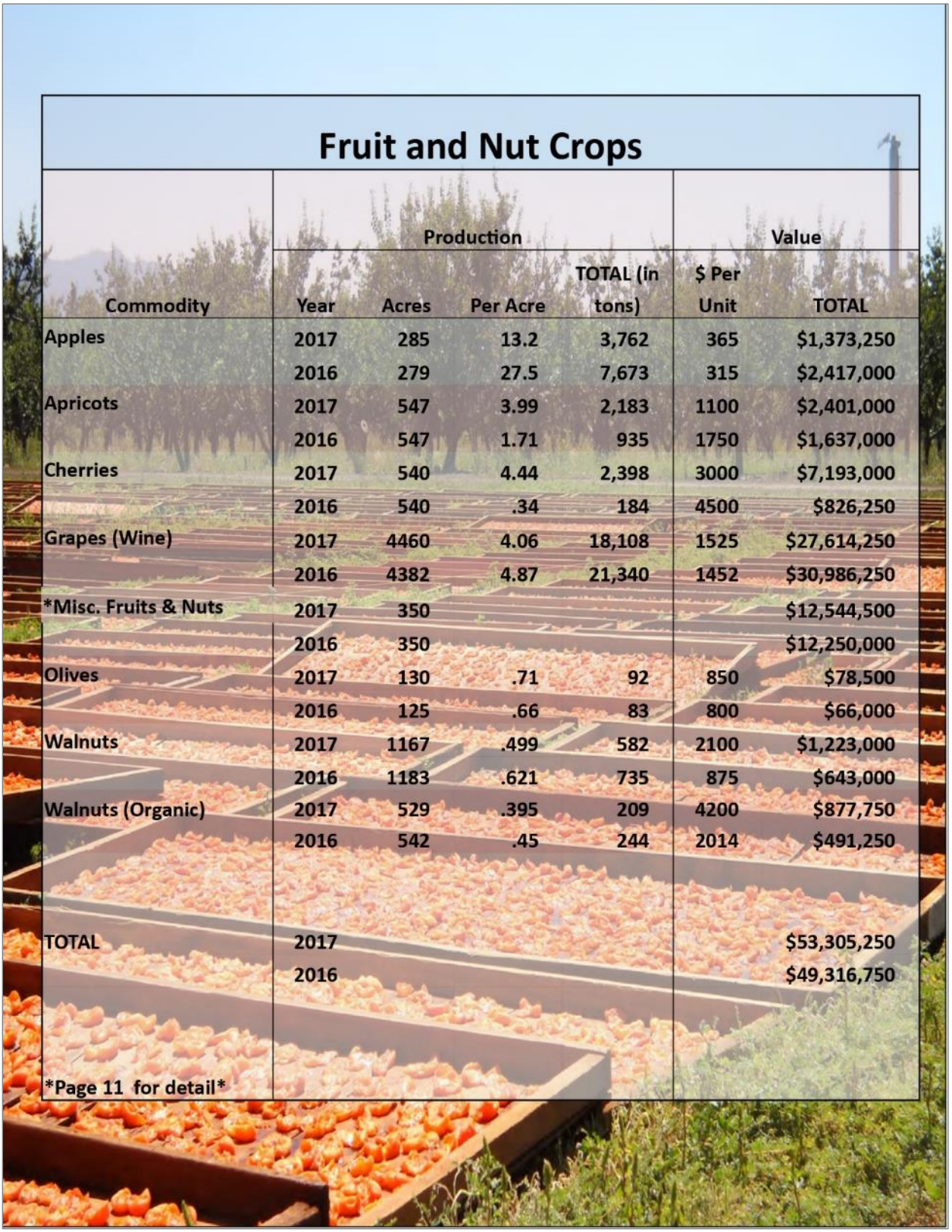


2017 Rank	Product		Value	% of Total	% Change from 2016
1	Misc. Vegetables	(1)	$ 47,952,000	14%	13% ↓
2	Spinach	(6)	$ 37,416,000	11%	48% ↑
3	Lettuce, Salad Mix	(2)	$ 34,861,500	10%	21% ↓
4	Wine Grapes	(5)	$ 27,614,000	8%	11% ↓
5	Lettuce, Romaine	(4)	$ 25,601,000	7%	23% ↓
6	Peppers, All	(3)	$ 22,070,750	6%	33% ↓
7	Broccoli/Broccolette		$ 16,886,750	5%	29% ↑
8	Kale, All	(7)	$ 14,878,500	4%	22% ↓
9	Pasture/Rangeland	(9)	$ 13,876,500	4%	10% ↑
10	Misc. Fruits & Nuts	(10)	$ 12,544,500	4%	2% ↑
	Total		$ 253,290,750	73%	



Vegetable and Row Crops

Commodity	Production				Value	
	Year	Acres	Per Acre	TOTAL (in tons)	$ Per Unit	TOTAL
Broccoli/Broccolette	2017	1,917	7.66	14,684	1,150	$16,886,750
	2016	1,397	7.87	10,994	1,193	$13,116,000
Celery	2017	587	33.60	19,723	445	$8,776,750
	2016	510	30.25	15,428	585	$9,025,500
Kale	2017	837	11.93	9,985	1,490	$14,878,500
	2016	1,344	12.14	16,310	1,168	$19,057,250
Lettuce, Iceberg	2017	1,498	18.48	27,683	376	$10,409,000
	2016	1,226	19.10	23,417	334	$7,843,500
Lettuce, Leaf (mixed)	2017	280	11.50	3,220	600	$1,932,000
	2016	307	10.86	3,334	666	$2,220,500
Lettuce, Romaine	2017	3,400	13.21	44,914	570	$25,601,000
	2016	3,779	13.07	49,312	666	$32,895,250
*Lettuce, Salad Mix	2017	7,788	4.04	27,778	1,255	$34,861,500
	2016	6,878	3.67	28,582	1,535	$43,873,500
*Misc. Veg. & Row Crops	2017	5,370	—	—	—	$47,952,000
	2016	6,176	—	—	—	$55,016,000
Onions-Shallots-Garlic	2017	1,100	—	—	—	$11,566,500
	2016	1,365	—	—	—	$12,929,000
Peppers, All Reported	2017	1,872	26.2	49,046	450	$22,070,750
	2016	1,890	28.6	54,054	610	$32,973,000
Spinach	2017	5,732	3.73	21,380	1,750	$37,416,000
	2016	4,286	3.48	14,915	1,698	$25,325,750
Tomatoes, Fresh	2017	636	14.16	9,006	1,340	$12,067,750
	2016	656	13.25	8,692	1,225	$10,648,000
Totals	2017					$244,418,500
	2016					$264,923,000
Page 11 for detail						

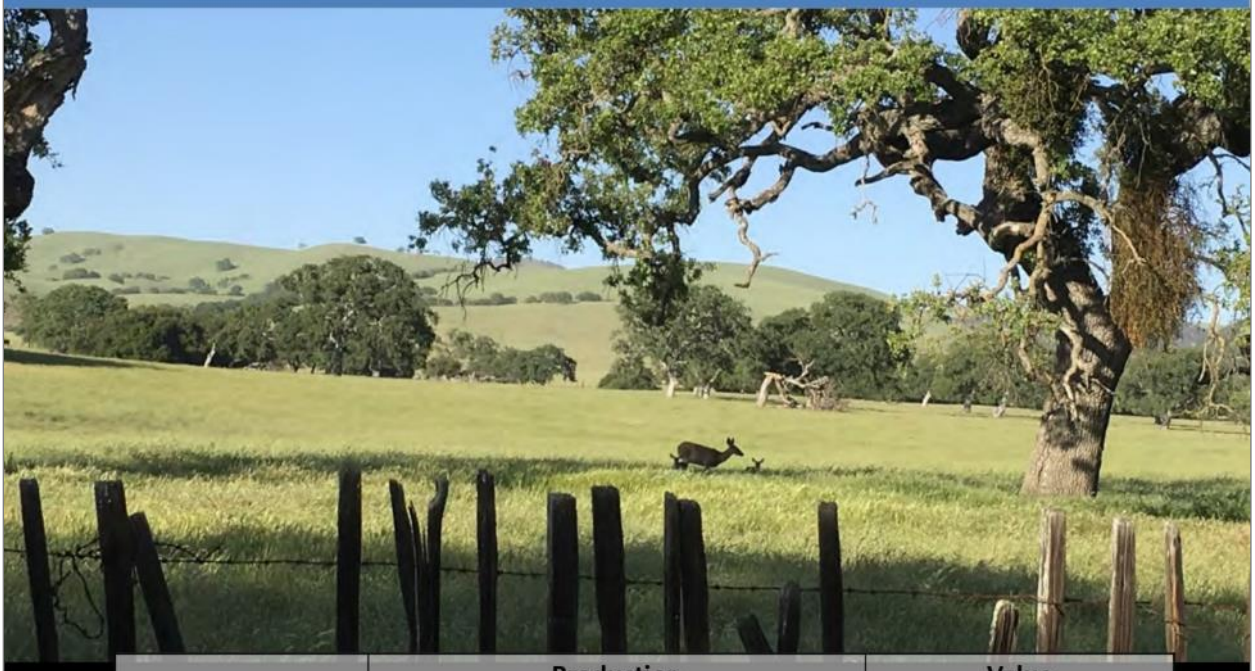


Fruit and Nut Crops

Commodity	Year	Production: Acres	Production: Per Acre	Production: TOTAL (in tons)	Value: $ Per Unit	Value: TOTAL
Apples	2017	285	13.2	3,762	365	$1,373,250
	2016	279	27.5	7,673	315	$2,417,000
Apricots	2017	547	3.99	2,183	1100	$2,401,000
	2016	547	1.71	935	1750	$1,637,000
Cherries	2017	540	4.44	2,398	3000	$7,193,000
	2016	540	.34	184	4500	$826,250
Grapes (Wine)	2017	4460	4.06	18,108	1525	$27,614,250
	2016	4382	4.87	21,340	1452	$30,986,250
*Misc. Fruits & Nuts	2017	350				$12,544,500
	2016	350				$12,250,000
Olives	2017	130	.71	92	850	$78,500
	2016	125	.66	83	800	$66,000
Walnuts	2017	1167	.499	582	2100	$1,223,000
	2016	1183	.621	735	875	$643,000
Walnuts (Organic)	2017	529	.395	209	4200	$877,750
	2016	542	.45	244	2014	$491,250
TOTAL	2017					$53,305,250
	2016					$49,316,750

Page 11 for detail

Field Crops



	Production				Value	
Commodity	Year	Acres	Per Acre	TOTAL (in tons)	$ Per Unit	TOTAL
Misc. Field Crops	2017	275				$687,500
	2016	240				$534,000
Grain Hay	2017	11,500	3.20	36,800	156.3	$5,750,000
	2016	11,750	3.16	37,130	150	$5,569,500
Nursery Stock	2017	130				$7,787,000
	2016	130				$7,686,000
Pasture/Rangeland	2017	504,600			27.5	$13,876,500
	2016	505,950			25	$12,649,000
Permanent Pasture	2017	290			325	$94,250
	2016	340			275	$93,500
Seed Crops	2017	385			7,400	$2,849,000
	2016	381			5,500	$2,095,500
TOTAL	2017					$31,044,250
	2016					$28,627,500

Cattle Country

	Production			Value	
	Year	# of Head	TOTAL Cwt	$ Per Cwt	TOTAL
All Cattle	2017	46,737			
	2016	47,875			
Calves	2017	12,340	78,400	163.60	$12,826,250
	2016	12,800	79,360	151.10	$11,991,500
Pasture and Stockers	2017	31,510	103,352	48.50	$5,012,750
	2016	32,860	103,509	48.00	$4,968,500
Cows	2017	2,775	38,850	91.00	$3,535,500
	2016	2,050	28,700	84.00	$2,411,000
Bulls	2017	112	2,162	94.00	$203,250
	2016	165	3,053	98.00	$299,250
TOTAL	2017				$21,577,750
	2016				$19,670,250

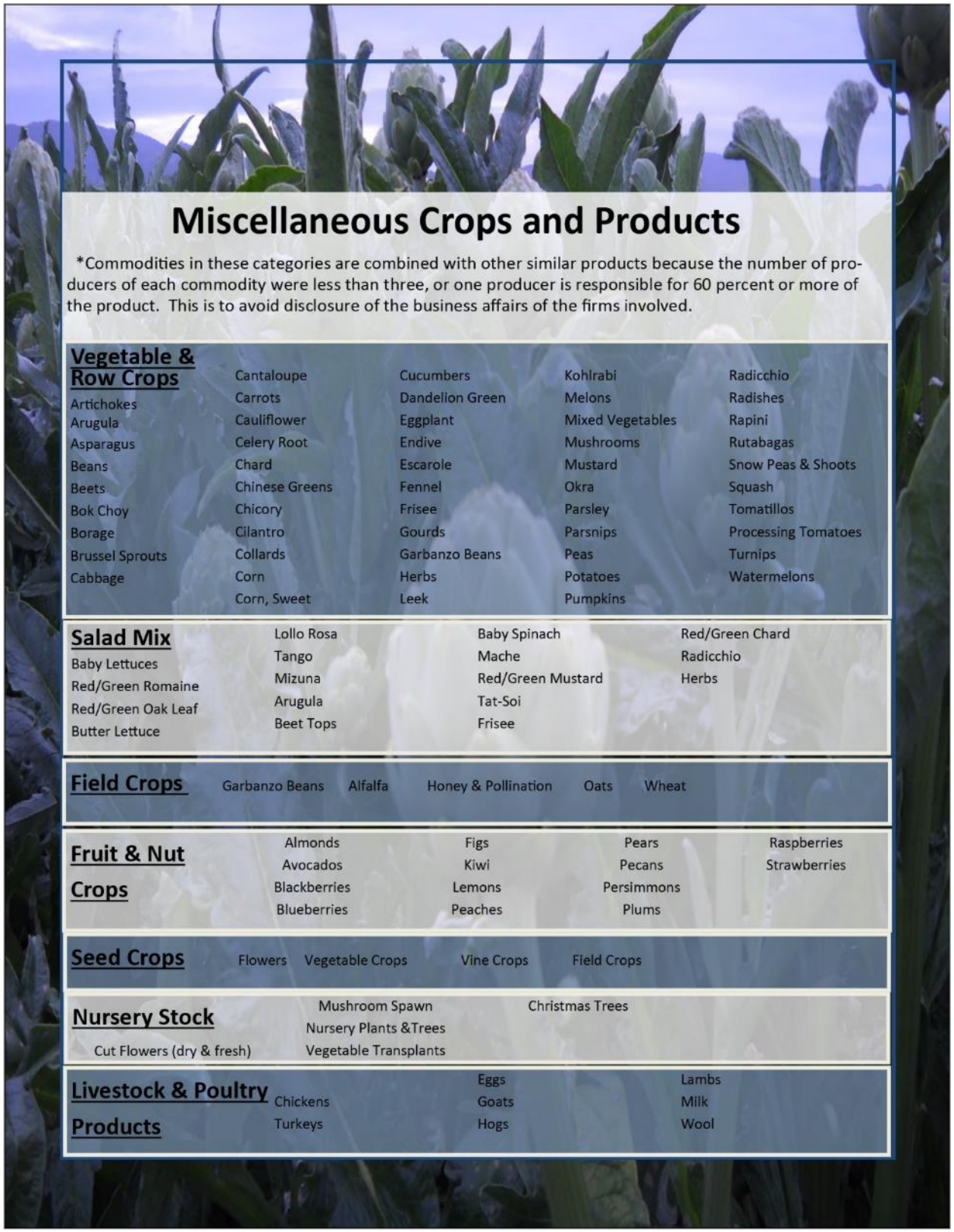
CATTLE HERD INVENTORY

	YEAR ROUND	*8-10 MONTHS*	*2-6 MONTHS*	*TOTAL HEAD*
2017	22,020	13,650	33,440	69,110
2016	21,620	13,000	33,260	68,680

Other Livestock & Poultry Products

Totals: 2017—$995,000 2016– $2,610,000

**Miscellaneous livestock and Poultry products listed on page 12*


Miscellaneous Crops and Products
*Commodities in these categories are combined with other similar products because the number of producers of each commodity were less than three, or one producer is responsible for 60 percent or more of the product. This is to avoid disclosure of the business affairs of the firms involved.
Vegetable & Row Crops
Artichokes
Arugula
Asparagus
Beans
Beets
Bok Choy
Borage
Brussel Sprouts
Cabbage
Cantaloupe
Carrots
Cauliflower
Celery Root
Chard
Chinese Greens
Chicory
Cilantro
Collards
Corn
Corn, Sweet
Cucumbers
Dandelion Green
Eggplant
Endive
Escarole
Fennel
Frisee
Gourds
Garbanzo Beans
Herbs
Leek
Kohlrabi
Melons
Mixed Vegetables
Mushrooms
Mustard
Okra
Parsley
Parsnips
Peas
Potatoes
Pumpkins
Radicchio
Radishes
Rapini
Rutabagas
Snow Peas & Shoots
Squash
Tomatillos
Processing Tomatoes
Turnips
Watermelons
Salad Mix
Baby Lettuces
Red/Green Romaine
Red/Green Oak Leaf
Butter Lettuce
Lollo Rosa
Tango
Mizuna
Arugula
Beet Tops
Baby Spinach
Mache
Red/Green Mustard
Tat-Soi
Frisee
Red/Green Chard
Radicchio
Herbs
Field Crops
Garbanzo Beans
Alfalfa
Honey & Pollination
Oats
Wheat
Fruit & Nut Crops
Almonds
Avocados
Blackberries
Blueberries
Figs
Kiwi
Lemons
Peaches
Pears
Pecans
Persimmons
Plums
Raspberries
Strawberries
Seed Crops
Flowers
Vegetable Crops
Vine Crops
Field Crops
Nursery Stock
Cut Flowers (dry & fresh)
Mushroom Spawn
Nursery Plants &Trees
Vegetable Transplants
Christmas Trees
Livestock & Poultry Products
Chickens
Turkeys
Eggs
Goats
Hogs
Lambs
Milk
Wool

Export Shipments Around The World

San Benito County Biologists facilitated world trade with 2,646 certified shipments all across the globe. Our top partners were Canada, Mexico, Japan, and Netherlands.

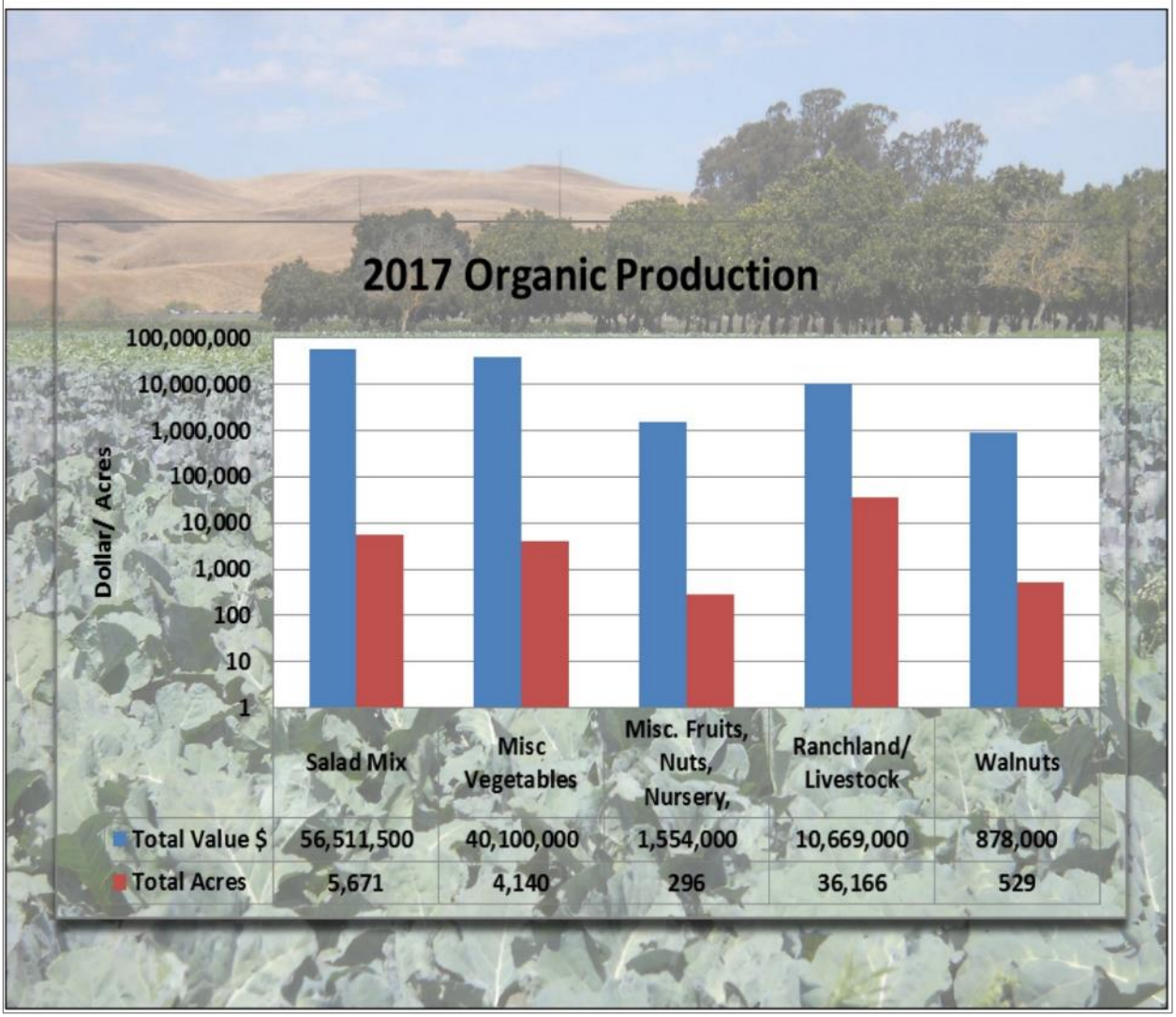
COUNTRY	SHIPMENTS
ALGERIA	20
ARGENTINA	20
AUSTRALIA	37
BOLIVIA	-
BRAZIL	26
CANADA	1,060
CHILE	21
CHINA	20
COLUMBIA	5
COSTA RICA	-
DOMINICAN REPUBLIC	13
ECUADOR	4
EGYPT	11
EL SALVADOR	2
FRANCE	27
GERMANY	1
GREECE	6
GUATEMALA	5
HONDURAS	5
HONG KONG	1
INDIA	35
INDONESIA	-

COUNTRY	SHIPMENTS
IRAN	6
IRAQ	20
ISRAEL	14
ITALY	55
JAPAN	135
JORDAN	18
KENYA	2
KOREA, REPUBLIC OF	11
KUWAIT	1
LEBANON	21
LIBYA	3
MEXICO	730
MOROCCO	13
NETHERLANDS	101
NEW ZEALAND	5
OMAN	8
PAKISTAN	4
PALESTINIAN TERRITORY	-
PANAMA	-
PARAGUAY	1
PERU	20

COUNTRY	SHIPMENTS
PHILIPPINES	10
POLAND	1
PORTUGAL	1
QATAR	1
RUSSIA	1
SAUDI ARABIA	20
SOUTH AFRICA	20
SPAIN	17
SUDAN	5
SWEDEN	1
SYRIAN ARAB REPUBLIC	14
TAIWAN	15
THAILAND	5
TRINIDAD and TOBAGO	1
TURKEY	13
UNITED ARAB EMIRATES	6
UNITED KINGDOM	3
UZBEKISTAN	4
VENEZUELA	-
VIETNAM	7
YEMEN	11

Organic Farming

Organic farming is an important part of the agricultural economy in San Benito County. San Benito County continues to see an increase in the numbers of producers and acres farmed each year. San Benito County had 87, CDFA registered growers, in 2017 which is a slight increase from 78 in 2016. Our growers produce a wide variety of crops including fruit, nut, vegetable, seed, nursery stock, field and livestock. The most popular and highest grossing commodities included salad mix varieties, spinach, and cole crops.



AG PROGRAMS

Agricultural Statistics

As required by the California Food and Agricultural Code, the County Agricultural Commissioner compiles an annual report of the County's agricultural production. With it's unique climate along with fertile soils and water supplies, agriculture is the County's largest industry. Yearly agricultural statistics have been compiled and reported by the San Benito Agricultural Commissioner's office since 1941 and can be viewed on the department's website: http://www.cosb.us/county-departments/agriculture/crop-report/.

Certified Farmers' Markets

The Hollister Farmer's Market was established to provide raw agricultural products directly to the consumers in San Benito County. This office inspects certified growing sites and markets to preserve the integrity of the direct marketing program.

Vegetable Standardization

This program ensures compliance with California's minimum standards regarding quality and marketing of all produce commercially grown and/or marketed in the state. Direct Marketing regulation and Organic law enforcement are part of a program that provides for local protection to growers, marketers and consumers.

Nursery & Seed Inspection

Through this program, the Commissioner inspects the growing, propagation, production and sale of nursery stock to assure cleanliness from pests, true variety and vigorous-healthy plants for sale to the consumer. Inspections are also performed at the retail and wholesale establishments that sell seeds. Samples are drawn for germination and purity testing. Labeling is inspected for compliance with state requirements. Through this program, certification services are also performed for growers and processors, in cooperation with the California Crop Improvement Association.

Pesticide Use Enforcement

California has the most comprehensive pesticide regulatory system in the nation. The Agricultural Commissioner is responsible for the implementation of the statewide program at the County level. This program regulates the proper, safe, and effective use of pesticides that are essential for production of food and for protection of the public health and safety. Structural and landscape use of pesticides are also regulated by the Commissioner. It also protects the environment from potentially harmful pesticides by prohibiting, regulating or ensuring proper stewardship of pesticides. Other components of the program include pesticide use reporting, incident investigations, outreach activities, inspection of users/distributors of pesticides and monitoring applications in the field.

Pest Detection

At the peak season, our office deployed 1205 insect detection traps throughout the county. These traps are designed to intercept new exotic and non-native insect species before they become established. Some of the insects we monitor for include:

Asian Citrus Psyllid
European Pine Shoot Moth
Japanese Beetle
Melon Fruit Fly
Mexican Fruit Fly
European Corn Borer
Glassy-winged Sharpshooter
Khapra Beetle
Mediterranean Fruit Fly
European Grapevine Moth
Gypsy Moth
Oriental Fruit Fly
Light Brown Apple Moth

* 12,761 servicing's completed in over 4200 hours. *

Pest Eradication

Invasive plant pests are eradicated throughout the year using a combination of chemical, mechanical, and biological control methods. Yellow & Purple Star-thistle, Scotch & Artichoke Thistle have been the targeted species.

Weights & Measures

"Promoting an equitable market"

Weights and Measures inspectors certify that the devices used in commerce, to weigh, measure, or count a product are correct. Some devices are large and used to weigh hundreds if not thousands of pounds. Pictured to the left is the county's weight truck that holds 16,000 pounds of 1,000 lb blocks. The on-board crane makes quick work of loading and unloading the blocks. When loaded the truck weighs 38,000 pounds.

The structure to the left is used to weigh cattle. It can hold multiple head of cattle and quickly have thousands of pounds on the platform.

To the right is a Torsion Balance that has a maximum weight capacity of 15.5 Grains, or about 1 gram.

Weights & Measures

Inspectors do a yearly inspection of all gasoline stations in the county to Insure the correct amount is dispensed to the customer.

To insure consumer protection the department will carry out price verification inspections. This corroborates the lowest advertised price with the price you are charged at the cash register.

Device Inspection Statistics

Measuring Device Inspections	Weighing Device Inspections
387 gas & diesel pumps	134 retail store scales
25 retail water meters	40 platform scales
11 fuel delivery truck meters	5 prescription/jewelers scales
3 fabric/cord/wire meters	1 railway scale
20 LPG meters	39 truck scales
378 Electric sub meters	63 cattle scales
238 Vapor Sub meters	120 Farmers market scales

Mosquito Abatement Program

Mosquito Control

In response to the introduction of West Nile Virus to California, the Agricultural Commissioner has responsibility for mosquito abatement. Our program utilizes surveillance and control methods following Integrated Pest Management practices incorporating public education, biological control, source reduction and least toxic pesticides that have minimal impact on people, wildlife, and the environment.

Monitoring

Adult mosquito monitoring is conducted each year during mosquito season from April-November. Standardized traps emitting carbon dioxide are used to determine mosquito populations, location, and species. Visual site evaluations for larvae detection are also completed in certain problem areas.

Chemical Control

Larvicide tablets and granular formulations are used to treat infested water features like neglected pools and fountains as well as stagnant, standing water on lawns, agricultural land, and parks. Larvicide is also applied to city storm drains each year as a preventative measure. Fogging sprays from ground rigs can also be used to reduce the adult population in problem areas, protecting communities from bites and the potential for the spreading of disease.

Biological Control

Biological control is employed through the use of

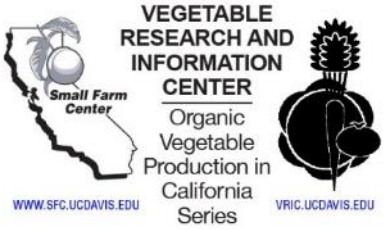
mosquito fish. Mosquito fish are a natural predator of mosquito larvae and have been shown to be effective at reducing or eliminating the production of mosquitos from target sources. Mosquito fish are a hardy species and survive well in a wide range of conditions, making them an efficient and cost effective method of control. The agricultural commissioner's office supplies mosquito fish at no cost to the public.

Public Outreach

Community Outreach involves education about proper pool maintenance, irrigation practices, and the overall reduction of stagnant water on one's property. The county holds outreach and educational demonstrations at schools, farmers markets and community events. For more information on

Attachment 5

SOIL FERTILITY MANAGEMENT FOR ORGANIC CROPS



MARK GASKELL, *UC Cooperative Extension Farm Advisor, Santa Barbara and San Luis Obispo Counties;* **RICHARD SMITH**, *UCCE Farm Advisor, Monterey and Santa Cruz Counties;* **JEFF MITCHELL**, *UCCE Vegetable Crops Specialist, Kearney Agricultural Center, Parlier;* **STEVEN T. KOIKE**, *UCCE Farm Advisor, Monterey and Santa Cruz Counties;* **CALVIN FOUCHE**, *UCCE Farm Advisor, San Joaquin County;* **TIM HARTZ**, *UCCE Vegetable Crops Specialist, UC Davis;* **WILLIAM HORWATH**, *Professor of Soils and Biogeochemistry, UC Davis; and* **LOUISE JACKSON**, *UCCE Vegetable Crops Specialist, UC Davis.*

Specific information on organic vegetable production practices in California is scarce, and growers need sound information to guide their management decisions. The Organic Vegetable Production in California Series is made up of publications written by Farm Advisors and Specialists from the University of California's Division of Agriculture and Natural Resources. Each publication addresses a key aspect of organic production practices applicable to all vegetable crops.

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Organic soil fertility management is guided by the philosophy of "feed the soil to feed the plant." This basic precept is implemented through a series of practices designed to increase soil organic matter, biological activity, and nutrient availability. For the current list of approved practices for organic certification, see the USDA National Organic Program (NOP) Web site at http://www.ams.usda.gov/nop/indexIE.htm. Adding organic materials such as cover crops, crop residues, and composts to cultivated soils over time builds soil organic matter and improves the ability of the soil to supply nutrients. The ultimate goal is a healthy, fertile, biologically active soil with improved structure and enhanced nutrient availability. Organic management practices strive to optimize diverse biological processes in the soil to create a complex environment that ensures adequate nutrition to the crop. For a discussion of related soil management practices, see *Soil Management and Soil Quality for Organic Crops* (UC ANR Publication 7248, http://anrcatalog.ucdavis.edu/pdf/7248.pdf).

ROLE OF ORGANIC MATTER AND HUMUS

Increasing soil organic matter is a key aspect of an organic production system. The formation and decomposition of soil organic matter are fundamental life-promoting processes that store and release energy derived from photosynthesis. Soil organic matter is mainly the product of microbial and faunal decomposition of plant residues. The decomposition of plant residue leads to the formation of humic substances, which constitute 70 to 80 percent of the organic matter in most soils. The remaining soil organic matter is termed "light fraction" or "particulate organic matter" and is composed of a continuum of material ranging from recently deposited litter to highly decomposed unrecognizable plant residues. Soils with higher clay contents in temperate climates generally have the most soil organic matter. In California, organic matter typically makes up 1 to 3 percent of the dry weight of cultivated agricultural soils and 4 to 6 percent of untilled pasture soils. Studies have shown that it is normally not possible to increase soil organic matter by more than 1 percent, but even an increase of this much can dramatically improve soil fertility.

During the formation of soil organic matter, nutrients such as nitrogen (N), phosphorus (P), and sulfur (S) are incorporated into the soil structure, allowing the soil to act as a reservoir of these and other nutrients. The decomposition of soil organic matter releases nutrients, at which point they become available for plant uptake. Generally, 2 to 5 percent of soil organic matter decomposes annually. Soil organic matter

UNIVERSITY OF CALIFORNIA
Division of Agriculture and Natural Resources
http://anrcatalog.ucdavis.edu
Publication 7249

contains a number of fractions that vary in composition and activity. Humus is the most resistant and mature fraction of soil organic matter. It is very slow to decompose and may last for hundreds of years. Plant residues that are high in carbon (C) and low in nitrogen, such as straw or cornstalks, decompose slowly but are efficient producers of humus. Residues that contain high levels of nitrogen, such as young cereals and legumes, decompose quickly, producing less humus. Although the process of organic matter formation is not well understood, it is clear that increasing the amount of soil humus improves soil properties and crop growth.

The decomposition of organic matter in soils can provide significant quantities of several important nutrients. A portion of the nitrogen from organic matter is converted into plant-available mineral forms such as ammonium (NH_4^+) and nitrate (NO_3^-) through the process of mineralization. However, the timing and amount of mineralization often do not coincide with crop need, making in-season fertilization necessary. This lack of synchrony between nitrogen mineralized from organic matter and crop nitrogen uptake is a major challenge for fertility management in organic systems. Organic matter is a good source of phosphorus; as phosphorus is mineralized from organic matter it becomes available for plant growth or becomes bound to soil minerals. Organic matter is also a significant source of micronutrients such as iron (FE), copper (Cu) and zinc (Zn).

In addition to supplying nutrients, soil organic matter improves soil fertility by imparting favorable chemical and physical attributes to soil. Soil organic matter can bind nutrients through the process of cation exchange. Ammonium (NH_4^+), calcium (Ca), magnesium (Mg), and potassium (K) are nutrient cations that are held on cation exchange sites on organic matter. The cation exchange capacity of soil organic matter can contribute from 20 to 70 percent of the total cation exchange capacity of soil. Soil structure is influenced by the association of soil organic matter with minerals to form aggregates. Aggregate formation improves soil structure and water infiltration and increases water-holding water capacity. These changes improve root growth and provide habitat for a diversity of soil organisms. Soil organic matter enhances nutrient cycling, provides habitat for a diversity of soil organisms, and creates a favorable environment for plant growth.

HOW TO DETERMINE NUTRIENT NEEDS

Crop nutrient requirements and the nutrient-supplying capacity of the soil dictate the management practices necessary for successful crop production. Soil testing is essential for the assessment of nutrient levels, and it is often required for organic certification. Management of nutrients such as phosphorus, potassium, calcium, magnesium, and sulfur should be directed toward raising these nutrients to optimal levels in the soil as determined by soil testing. Phosphorus availability in soils with pH greater than 6.0 is assessed by the Olsen bicarbonate test; for soils with pH less than 6.0 the Bray test is used. In most vegetable production areas in California soil pH is greater than 6.0, so this discussion will focus on the Olsen bicarbonate soil test. Natural levels of phosphorus in most California soils were formerly less than 30 ppm. Over years of fertilization for commercial vegetable production, fields now routinely have soil phosphorus greater than 60 ppm along the coast, and somewhat less in the interior valleys. Phosphorus availability is reduced at low soil temperatures (i.e., < 60°F, or 15.6°C) and, as a result, crops grown in the cooler part of the year need higher levels of available soil phosphorus for good growth. Approximate soil adequacy values from the bicarbonate phosphorus test for warm- and cool-season vegetables are given in table 1.

Table 1. Adequate soil phosphorus levels (bicarbonate phosphorus test)

Crop	Adequate soil P level (ppm)
warm-season vegetables	20–25
cool-season vegetables	50–60

Compost and certain organic fertilizers are good sources of phosphorus. It is important to monitor soil phosphorus levels on a yearly basis, as soil phosphorus can rapidly build up high to levels when composts and other organic amendments are used. Excessive soil phosphorus can result in high phosphorus concentration in field runoff, which can impair the quality of surface waters such as rivers, creeks, and lakes.

Soil potassium level is best determined by an ammonium acetate extraction test. In general, if soil potassium is greater than 200 ppm, no increase in yield is likely to be obtained with additional potassium fertilization. However, maintenance applications of potassium may be helpful in replacing soil potassium that is removed in the crop. For soils at less than 150 ppm potassium, fertilization is warranted. Composts and some organic fertilizers are good sources of potassium.

Calcium, magnesium, and sulfur are usually present in the soil and in irrigation water in sufficient quantities to adequately supply a crop. In very sandy soils with low levels of organic matter, sulfur availability may be limited, but normal organic practices (application of compost, use of sulfur as a fungicide) typically maintain adequate levels of soil sulfur. While neither calcium nor magnesium availability is

often limiting for crop nutrition, in some fields relatively low soil calcium and/or high magnesium content can result in poor soil structure and slow water infiltration. In these circumstances application of gypsum (naturally occurring calcium sulfate) is the most appropriate remedy.

In organic systems, appropriate nitrogen management cannot be directly inferred from a simple soil test. Unlike conventional production, in which nitrogen management is based on the use of soluble, readily available nitrogen fertilizers, in organic systems nitrogen management is based on manipulating organic sources of nitrogen; organic nitrogen must be mineralized through the action of soil microbes before it is available for plant uptake. Although this process can supply a significant quantity of nitrogen, estimating the amount and timing of nitrogen mineralization is complicated because a number of factors affect the process. The most important of these factors are as follows.

- Soil temperature: Mineralization is insignificant below 50°F (10°C), but above that temperature, mineralization increases as soil temperature increases.
- Soil moisture: Mineralization proceeds rapidly in moist soils, but is inhibited by either excessively wet or dry conditions.
- Tillage practices: Soil tillage stimulates a temporary burst of microbial activity, which declines over the course of days or weeks.

Despite the complex interactions of these factors, a rough estimate of mineralization from soil organic matter can be made based on the amount of organic nitrogen present in the soil and the percentage of that nitrogen likely to mineralize over a given period of time. The following procedure describes a method for estimating the amount of nitrogen likely to be mineralized from soil organic matter.

The first step is to estimate the amount of organic nitrogen in the soil. This can be done directly by a specialized laboratory test, or it can be inferred from the soil organic matter content. In most agricultural soils, organic nitrogen constitutes approximately 7 percent of soil organic matter. The vast majority of nitrogen mineralization takes place in the top 1 foot (30 cm) of soil. A standard estimate of soil weight is 4,000,000 pounds of dry soil per acre-foot (about 1,816,000 kg /100 cubic meters). The organic nitrogen content of a soil with 1 percent organic matter would be

> 4,000,000 lb soil × 0.01 (percent organic matter) × 0.07 (percent N in organic matter) = 2,800 lb organic N/acre (3,136 kg/ha)

The second step is to estimate the percentage of soil organic nitrogen likely to mineralize during the crop cycle. Laboratory incubation studies of dozens of California soils have shown that, at best, about 2 percent of soil organic nitrogen is mineralized in a 2-month period at 77°F (25°C). For a soil with 1 percent organic matter, that would be

> 2,800 lb organic N/acre × 0.02 (percent of organic nitrogen that mineralizes) = 56 lb plant-available N/acre (63 kg/ha)

The 2 percent estimate for nitrogen availability for a short-term annual crop can be adjusted to fit field-specific conditions based on the factors previously described. Fields that are sprinkler-irrigated keep the entire soil surface moist, while much of the surface soil in drip-irrigated fields may be very dry. The soil temperature during spring and fall crops is lower than that for summer crops. Fields in which any form of reduced tillage is practiced tend to have slower nitrogen mineralization. Heavy clay soil is more readily waterlogged by rain or irrigation, and effective nitrogen mineralization may be reduced. Note that this technique for estimating nitrogen mineralization from soil organic matter does not take into account the nitrogen contribution from recently incorporated crop residue, compost, or other organic amendments. These contributions are described elsewhere in this publication.

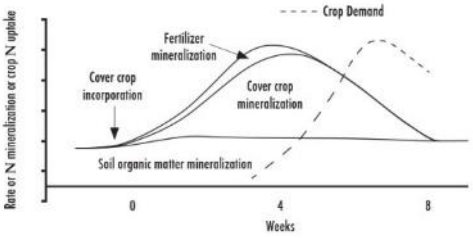
Synchronizing nitrogen mineralization from soil organic matter, cover crop residues, and organic amendments to maintain adequate nitrogen availability for crop production is challenging. The generalized pattern of nitrogen mineralization and crop nitrogen uptake is presented in figure 1. The rate of nitrogen mineralization from soil organic matter and recently incorporated residues and amendments typically peaks before the crop reaches its maximum rate of nitrogen uptake. Even in organic systems, nitrogen loss through leaching or denitrification (conversion of nitrate to gaseous nitrogen in wet soil and subsequent loss to the atmosphere) can be substantial if excessive water from rain or irrigation is applied to the field in the early weeks of the growing season.

Short-season crops with low nitrogen requirements such as leafy greens and radishes (table 2) may produce well with the nitrogen available from soil organic matter plus cover crop residues and/or a compost application. Crops with higher nitrogen requirements and longer growing seasons often need supplemental sidedress applications of organic nitrogen fertilizer. For many vegetable crops, quality is as important as yield. Product size, color, and uniformity can be critical, and nitrogen management is often the key to maximizing these quality attributes.

Table 2. Nitrogen requirement of vegetable crops based on seasonal nitrogen uptake

Low total N content < 120 lb/acre	Medium total N content 120–200 lb/acre	High total N content > 200 lb/acre
baby greens	carrot	broccoli
beans	corn, sweet	cabbage
cucumbers	garlic	cauliflower
radish	lettuce	celery
spinach	melons	potato
squashes	onion	
	peppers	
	tomatoes	

Figure 1. Timing of nitrogen mineralization from soil organic matter, cover crop residue, and organic fertilizer in relation to crop nitrogen uptake.



NUTRIENT SOURCES

Cover Crops

Cover crops fix and trap nutrients, add organic matter to soils, and reduce nitrate leaching, nutrient runoff, and soil erosion. In California, cover crops are widely used in organic farming systems because the climate is mild enough to support growth during the fall, winter, and early spring in most crop production areas. Nonleguminous cover crops, such as grasses and *Brassica* species, are preferred in situations where nutrient availability is high in the fall and where cover crops can trap nitrate and phosphate that would otherwise be lost by leaching or runoff. Nonlegumes also tend to be more tolerant of cooler temperatures than legumes. Legumes fix atmospheric nitrogen, at least when concentrations of mineral nitrogen in the soil are low, and add to the net availability of nitrogen in the cropping system. Mixtures of legumes and grasses are a common strategy because the grass consumes soil nitrogen, avoiding high soil nitrogen concentrations than might otherwise inhibit fixation. Mixtures also ensure that the cover crop is productive under a range of weather condition, due to the different environmental tolerances of the various plant species.

In California, cover crops typically take up or fix from 100 to 200 pounds of nitrogen per acre (112 to 224 kg/ha). Cover crops are often tilled into the soil when the carbon to nitrogen (C:N) ratio is less than 20:1 (e.g., legumes and younger stages of cereals and mustards) to achieve a net release of nitrogen to the soil in order to feed subsequent vegetable crops. The high nitrogen content in cover crops reduces competition for mineral nitrogen between the subsequent vegetable crop and the soil microbiota. When cover crops with a low nitrogen content, such as mature cereals (i.e., C:N ratio > 20:1) are incorporated into the soil, subsequent vegetable crops can be temporally nitrogen deficient because soil microbes use available soil nitrogen to break down the cover crop residue. However, these cover crops with a higher C:N ratio are instrumental in building soil organic matter, which is advantageous for long-term soil fertility and improvements in soil physical properties. A longer-term grass or brassica cover crop is therefore recommended periodically, as long as cropping patterns permit a sufficient period without crop production for residue decomposition to occur.

Less than half of the amount of nitrogen in a cover crop typically becomes available to the subsequent crop. Much of the cover crop nitrogen remains in resistant organic forms in soil organic matter, unavailable to plants. The organic nitrogen in the readily decomposable fraction of cover crop residues, however, can be very rapidly mineralized to plant-available forms of nitrogen in the first few weeks after incorporation. The rate of mineralization of available nitrogen from a cover crop with a low C:N ratio (< 20:1) increases over a 3- to 6-week period following incorporation, and then returns to preincorporation levels by weeks 6 to 8 (see fig. 1). Therefore, a cover crop can be a valuable short-term source of nitrogen, but longer-season vegetable crops following a cover crop rotation may require additional applications of nitrogen later in the season. When nitrogen from cover crops is mineralized it can be taken up and used by the crop or lost via leaching during spring rainy periods. For this rea-

son, vegetable crops should be planted relatively soon after cover crop incorporation, although the cover crop should be allowed to decompose for at least 3 to 4 weeks in order to avoid potential stand establishment and pest problems that may arise as the residue decomposes.

Compost

Compost, particularly if it contains animal manure, can be a relatively cost-effective organic source of both macro- and micronutrients. When applying compost, the challenges are to know its composition and to understand how to use it most efficiently. The grower should know the composting process used by the supplier as well as the sources of the raw material in the compost. If the materials that are being composted are low in nutrients, the compost will have a low nutrient analysis. Poor-quality or immature compost may actually tie up nitrogen in the soil and decrease the availability of nitrogen to the growing crop. The C:N ratio of a compost is one indication of nitrogen availability. As the C:N ratio rises above 20:1, the tendency for nitrogen from the soil to be tied up increases. A compost with a C:N ratio of less than 20:1 generally releases nitrogen to the succeeding crop. Other quality considerations for compost are age, particle size, pH, salt concentration, and purity (the volume of soil, sand, and other nonorganic materials mixed with the compost). The National Organic Program (Section 205.203) describes additional standards for compost sources (see the NOP Web site). Because compost analysis is based on dry weight, moisture content adds to the compost's weight and lowers its nutrient analysis. It is not unusual for a commercial compost to have a moisture content of 25 to 30 percent.

Mineralization rates from compost application are relatively low, and compost is usually a poor short-term source of nitrogen. Recent studies have shown that typically no more than 15 percent of the nitrogen in the compost is made available the first year following incorporation. This may in part explain problems with nitrogen fertilization often observed during the transition from conventional to organic production. A longer-term program of repeated compost application would be required to increase the overall amount of soil organic nitrogen and increase the nitrogen mineralization potential.

Manure

Aged animal manure can be a balanced source of nitrogen and other major and minor nutrients. Manure can be used in organic production only if it is applied to non-food-crop land, or incorporated into the soil at least 120 days prior to harvest if the edible portion is in contact with the soil, or incorporated into the soil at least 90 days prior to harvest if the edible portion is not in contact with the soil. One potential limitation of manure is the availability of a consistent supply of a material that is uniform enough to be confidently incorporated into a production program. A public perception of food-safety problems relating to manure fertilization might further limit the use of manure, and it is important to check with potential buyers to be certain that they do not have internal policies restricting manure use. Most manure used in organic vegetable production is composted prior to field application, which minimizes food-safety risks.

Commercial Organic Fertilizers

A number of approved organic fertilizers are available; common examples are listed in table 3. Most of these materials are by-products of fish, livestock, and food processing industries. The commercial formulations and nutrient analyses of these materials vary considerably. In general, they range from 0 to 12 percent nitrogen and may contain phosphorus and/or potassium. These fertilizers tend to be quite expensive, and in general their use is confined to situations where cover cropping or the application of compost is not feasible or has supplied insufficient nutrient availability for the upcoming cash crop. The value of these fertilizers lies in relatively rapid availability of the nutrients contained.

Table 3. Nutrient analysis (percent) of common organic fertilizer materials

Material	Nitrogen (%)	Phosphorus (% P_2O_5)	Potassium (% K_2O)
chilean nitrate	16	0	0
blood meal	12	0	0
feather meal	12	0	0
fish meal or powder	10–11	6	2
seabird and bat guano	9–12	3–8	1–2
meat and bone meal	8	5	1
soybean meal	7	2	1
processed liquid fish residues	4	2	2
alfalfa meal	4	1	1
pelleted chicken manure	2–4	1.5	1.5
bone meal	2	15	0
kelp	<1	0	4
soft rock phosphate	0	15–30	0
potassium-magnesium sulfate	0	0	22

The short-term availability of nutrients depends largely on the nature of the fertilizer material and how it was processed. Table 4 compares mineralization rates for various organic nitrogen sources at different temperatures. These fertilizers can be applied prior to planting or in one or more supplemental side-dressings.

Materials such as processed liquid fish, liquid soybean meal, or sodium nitrate may also be applied through drip irrigation systems. Some of these products contain small particles that are suspendable in water but not truly soluble; the water filtration necessary for microirrigation systems may remove these particles, lowering the nutrient content delivered to the crop. Dilute liquid "teas" from these materials are sometimes applied to the soil or sprayed directly on the plant in an effort to improve nutrient availability, but the value of these teas as a nutrient source has not been clearly established.

Certain by-products of the meat processing industry, such as blood and bone meals, have been restricted by some vegetable growers and shippers for market-related reasons. Mined Chilean nitrate (sodium nitrate), a source of nitrogen that is rapidly available to plants, was an important component of organic fertilizer programs in the past because of its relatively low cost, solubility, and ease of use. However, concerns that the mining and use of this product present environmental risks, as well as the widespread view within the organic movement that reliance on a soluble mineral nitrogen fertilizer is incompatible with organic principles, has limited its use in recent years. The NOP currently restricts the use of Chilean nitrate to no more than 20 percent of total nitrogen use and mandates that organic producers develop a plan to phase out Chilean nitrate use over time.

Minor Element Sources

Organic fertilizer sources commonly contain one or more minor elements. A number of liquid materials and teas are also available that provide one or more minor elements. Some of these materials may be used in irrigation systems or applied to foliage. Field trials evaluating the effectiveness of minor element foliar applications when soil nutrient levels are already adequate do not show a consistent pattern of crop response. The costs of these materials vary widely. Synthetic fertilizers may be permitted by a certifying agency in specific circumstances for correction of minor element deficiencies. Synthetic minor element fertilizers may contain hazardous materials used as fillers or other contaminants, and there is debate over the use of these materials, even in small amounts, in organic production systems.

Special-purpose Fertilizers

Specific approved nutrient sources of potassium, calcium, and magnesium may be useful to an organic grower when a deficiency or imbalance is indicated by a soil test. Materials such as gypsum, lime, and potassium-magnesium sulfate have been in use in agriculture for many years, and their value is thoroughly tested. These materials may be used to correct deficiencies or imbalances of potassium, calcium, or magnesium, or to raise soil pH. Gypsum is also used to improve water infiltration on soils with poor structure. Growers and researchers are still evaluating a number of other special-purpose fertilizers and growth enhancers. Materials derived from kelp and other processed seaweeds contain nutrients and often plant hormones and growth regulators. Some manufacturers claim that microbial soil stimulants enhance growth or reduce soil pests.

Table 4. Net nitrogen mineralization (as a percentage of initial organic nitrogen) from organic fertilizers, as influenced by temperature and length of incubation

Product	Temperature		Net N mineralization during incubation (%)		
	°F	°C	1 week	4 weeks	8 weeks
pelleted poultry manure	59	15	4	16	21
	77	25	10	23	36
sea bird guano	59	15	49	57	60
	77	25	45	48	54
pelleted sea bird guano	59	15	42	61	64
	77	25	46	60	67
fish powder	59	15	51	55	61
	77	25	48	60	64
feather meal	59	15	42	56	59
	77	25	50	64	63
blood meal	59	15	41	60	64
	77	25	51	67	70

Brix mixes, humates, foliar nutrient and sugar solutions, and other materials are applied to raise nutrient or sugar levels (Brix) in plant sap in an attempt to improve the plant's resistance to pests. There is scant scientific data supporting the efficacy or cost-effectiveness of such products.

CHARACTERISTICS OF ORGANIC FERTILIZERS

Organic fertilizer materials share a number of characteristics that distinguish them from conventional fertilizers. The key features to consider in a fertility management program are bulk, nutrient availability, and uniformity.

Bulk

Many organic fertilizer materials (e.g., compost or other organic by-products) are generally less concentrated sources of nutrients than are conventional fertilizers. Application rates for these materials are commonly 5 to 10 tons per acre (11.2 – 22.4 T/ha), sometimes more. Growers need to consider how they will transport, store, and apply such large quantities of material. Larger storage facilities and special handling equipment may be necessary.

Nutrient Availability

Organic fertilizers often include both a relatively small proportion of readily available soluble nutrients and another nutrient fraction that is either unavailable to the plant or available only gradually over time. These materials as a group need to be applied earlier in anticipation of plant nutritional requirements, often 2 to 4 weeks before nutrients will be needed. The availability of nutrients depends on microbial activity: a lack of mixing with the soil or extremes of soil moisture or temperature will slow nutrient availability. The composition and particle size of the material can also be determining factors in the rate of microbial decomposition and nutrient availability. A more concentrated, finer-textured material generally decomposes and releases its nutrients more readily than does a coarser mixture.

Uniformity

Organic fertilizer materials can vary considerably with respect to particle size, moisture content, nutrient content, and nutrient distribution. Some of this inconsistency is inherent in the materials because of the nature of the production process and the fact that these are organic materials that continue to change during transport and storage. Growers should try to determine the composition of key fertilizer materials and keep records of their variations over time. It may be worthwhile to send samples of composts and organic fertilizers to an independent laboratory for analysis.

The transitional period for new organic operations can be the most demanding in terms of soil fertility management. This is because the benefits of soil building and soil organic matter improvement have not yet been realized in a transitional field, but the grower is limited to only a few soluble fertilizer materials. Growers gain experience during the transitional period, and as the soil organic matter builds, its benefits are reflected in improved soil fertility. Approved materials lists have been developed by the NOP and include a broad range of materials to supplement crop nutritional needs. Materials from organic or natural sources may contain contaminants such as salts, heavy metals, and boron that may accumulate to toxic levels on a given field. Choose carefully from the materials available; know the source of the material and its composition.

RESOURCES

AgNIC (Agriculture Network Information Center) Web site, http://www.agnic.org.

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Attachment 6

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CALIFORNIA CODE OF REGULATIONS

FOOD AND AGRICULTURAL CODE

DIVISION 7, AGRICULTURAL CHEMICALS, LIVESTOCK REMEDIES, AND COMMERCIAL FEEDS

CHAPTER 5. FERTILIZING MATERIALS [14501 - 14682]

Article 1. General Provisions [Sections 14501 – 14505]

14501. The Legislature finds and declares that it is the intent of this chapter to do all of the following:

(a) To promote the distribution of effective and safe fertilizing materials essential for the production of food and fiber.

(b) To provide assurance to the consumer of commercial fertilizers, agricultural minerals, packaged soil amendments, and auxiliary soil and plant substances that the product purchased is properly identified, and to provide assurance of the validity of the quality and quantity represented by the manufacturer of these products.

(c) To provide funds for the administration and enforcement of this chapter.

14502. The secretary shall enforce this chapter and adopt and enforce such regulations relating to the manufacture, guaranteeing, labeling, and distribution of, the manner of reporting tonnage for, and making inspection tonnage fee payments upon, fertilizing materials as the secretary determines necessary to carry out this chapter. A copy of those regulations shall be mailed promptly upon adoption to each person who is licensed pursuant to this chapter. The failure of any licensee to receive a copy of the regulations is not a defense to a violation of the regulations.

14502.1. The secretary shall notify every licensee that manufactures, distributes, or sells ammonium nitrate, as defined in Section 14512.5, of their duty to maintain records pursuant to Section 14612.5 and to notify the secretary as to where those records may be obtained by him or her.

14503. Any money which is received by the director pursuant to this chapter shall be paid into the State Treasury to the credit of the Department of Food and Agriculture Fund, to be expended solely for the administration and enforcement of this chapter.

14504. The secretary shall prepare an annual statement of the operating expenditures and revenue related to this chapter which shall be presented to the board for review as soon as possible following the termination of the fiscal year. A copy of this statement shall be made available to any interested person upon request.

14505. Agricultural products derived from municipal sewage sludge shall be regulated as a fertilizing material pursuant to this chapter, and when used in general commerce, these products are not subject to regulation as a hazardous substance pursuant to

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Section 108130) of the Health and Safety Code and are not subject to regulation as a waste under Chapter 6.5 (commencing with Section 25100) of Division 20 of the Health and Safety Code.

Article 2. Definitions [Sections 14511 – 14564]

14511. "Agricultural liming materials" are agricultural minerals composed of calcium or magnesium compounds, or both, which are capable of neutralizing soil acidity and which are distributed in this state for that purpose.

14512. "Agricultural mineral" means any substance with nitrogen (N), available phosphoric acid (P_2O_5), and soluble potash (K_2O), singly or in combination, in amounts less than 5 percent which is distributed for farm use, or any substance only containing recognized essential secondary nutrients or micronutrients in amounts equal or greater than minimum amounts specified by the director, by regulation, and distributed in this state as a source of these nutrients for the purpose of promoting plant growth. It shall include gypsum, liming materials, manure, wood fly ash, sewage sludge not qualifying as commercial fertilizer, and captured dilute solutions.

14512.5. "Ammonium nitrate" means solid ammonium nitrate that is chiefly the ammonium salt of nitric acid, contains not less than 33 percent of nitrogen, one-half of which is in the ammonium form and one-half of which is in the nitrate form, and is produced, imported, stored, offered for sale, sold, offered for distribution, received, or intended for use as a plant nutrient.

14513. "Auxiliary soil and plant substance" means any chemical or biological substance or mixture of substances or device distributed in this state to be applied to soil, plants, or seeds for soil corrective purposes; or that is intended to improve germination, growth, yield, product quality, reproduction, flavor, or other desirable characteristics of plants; or that is intended to produce any chemical, biochemical, biological, or physical change in soil; but does not include commercial fertilizers, agricultural minerals, pesticides, soil amendments except biochar, or manures. It shall include the following:

(a) Bacterial inoculants.

(b) Biotics.

(c) Lignin or humus preparations.

(d) Microbial products, including genetically engineered microorganisms.

(e) Soil binding agents.

(f) Synthetic polyelectrolytes.

(g) Wetting agents to promote water penetration.

(h) Any similar product intended to be used for influencing soils, plant growth, or crop or plant quality, including biochar.

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14513.5. "Biochar" means materials derived from thermochemical conversion of biomass in an oxygen-limited environment containing at least 60 percent carbon.

14514. "Biotics" means all materials for which claims are made relating to organisms, enzymes, or organism by-products.

14515. "Board" means the Fertilizer Inspection Advisory Board.

14516. "Brand" means any term, design, or trademark used in connection with a fertilizing material product.

14517. "Bulk material" means fertilizing materials distributed in nonpackaged form or in a container containing more than 50 kilograms or 110 pounds.

14518. "Business location" means any place where fertilizing materials are sold or stored for later sale, except storage of package materials on premises operated exclusively as a public warehouse.

14519. "Captured dilute solutions" means solutions that contain low levels of plant nutrients as a result of equipment rinsing and runoff.

14520. "Chelates" means compounds, usually organic, which can combine with a metal ion and form a ring structure between a portion of the chelating agent molecule and the metal.

14521. "Chelated plant nutrients" means compounds of metallic secondary nutrients and micronutrients with organic chelating agents which have the property of being available under pH conditions in which the nutrients normally form insoluble compounds.

14522. "Commercial fertilizer" means any substance which contains 5 percent or more of nitrogen (N), available phosphoric acid (P_2O_5), or soluble potash (K_2O), singly or collectively, which is distributed in this state for promoting or stimulating plant growth. "Commercial fertilizer" includes both agricultural and specialty fertilizers. "Specialty fertilizers" may contain less than 5 percent nitrogen (N), available phosphoric acid (P_2O_5), or soluble potash (K_2O), singly or collectively.

14523. "Common carrier" means a company licensed with the Public Utilities Commission that hauls for hire.

14524. "Complex" means bonding which includes both of the following:

(a) "Natural organic complexes" means organic by-products of the wood pulp and other industries, such as the lignin sulfonates and polyflavinoids, that form complexes with metallic secondary nutrients and micronutrients. "Natural organic complexes" do

not include synthetic chelates in that natural organic complex, generally known as the natural organic chelates which are polymers, for which the nature of the metallic bonding is not known.

(b) "Inorganic complexes" include inorganic cations which form coordinate chemical bonds with other inorganic cations, anions, or neutral molecules, such as where metal-ammonia complexes of zinc or ammonia are coordinately bonded to the metal cation, and which usually reacts differently than the metal alone in solutions, but dissociates in soil and reacts as the uncomplexed cation.

14525. "Compost" means a biologically stable material derived from the composting process.

14526. "Composting" means the biological decomposition of organic matter which inhibits pathogens, viable weed seeds, and odors. "Composting" may be accomplished by mixing and piling in a way as to promote aerobic or anaerobic decay, or both.

14527. "Derivation statement" means the sources of all guaranteed primary nutrients or secondary nutrients, or both, and micronutrients.

14528. "Discontinued manufacturing" means an auxiliary soil and plant substance, packaged agricultural mineral, packaged soil amendment, organic input material, and specialty fertilizer that is no longer manufactured, but is still offered for sale.

14529. "Distribute" means to sell, offer, expose for sale, exchange, barter, or otherwise supply products for use in, or shipment within or into, this state.

14530. "Distributor" means any person who imports or consigns a fertilizing material or who offers for sale, sells, barters, or otherwise supplies this product for use in, or shipment within or into, this state.

14531. "Experimental use" means any application of a fertilizing material which is not offered for sale, has no commercial value, and is for the sole purpose of obtaining scientific data.

14532. "Farm use" means that the fertilizing material is used primarily for application to crops produced for commercial value.

14533. "Fertilizing material" means any commercial fertilizer, agricultural mineral, auxiliary soil and plant substance, organic input material, or packaged soil amendment.

14534. "Fish emulsion" means fertilizing material from which the guaranteed nutrients are derived primarily from fish, which contains a minimum of 40 percent total solids from fish, and which may contain additional sources of nitrogen, available phosphoric acid, and soluble potash for standardization purposes or stabilization purposes, or for both

purposes, that shall be included in the required guaranteed analysis and derivation statement.

14535. "Grade" means the percentage of total nitrogen, available phosphoric acid, and soluble potash stated in the same terms, order, and percentage as the guaranteed analysis.

14536. "Guaranteed analysis" means the minimum percentage of primary or secondary plant nutrients or micronutrients, or both, claimed.

14537. (a) "Gypsum" means calcium sulfate dihydrate, a mineral used in the fertilizer industry as a source of calcium and sulfur which is also known as landplaster.

(b) "Phosphatic sulfate gypsum" means a by-product of calcium dihydrate from the manufacture of phosphoric acid, also known as phosphogypsum.

14538. "Hydroponics" means a system in which water soluble primary or secondary plant nutrients or micronutrients, or combination thereof, are placed in intimate contact with the plant's root system, being grown in a water or an inert supportive medium which supplies physical support for the roots but which does not add or subtract primary or secondary plant nutrients or micronutrients, or both.

14539. "Investigational allowance" means an allowance for variation inherent in the taking, preparation, and analysis of an official sample of fertilizing materials.

14540. "Label" means the display of all written, printed, or graphic matter on the immediate container of, or a statement, including the guaranteed analysis, accompanying fertilizing material.

14541. "Label guarantor" means the manufacturer's or person's name appearing on the label of a fertilizing material.

14542. "Labeling" means all written, printed, or graphic matter on, accompanying, or used in promoting the sale of any fertilizing material, including advertisements, brochures, posters, and television and radio announcements.

14543. "Licensee" means a person who has obtained a license pursuant to this chapter.

14544. "Manufacturer" means a person who produces, sells, or distributes a fertilizing material in this state that bears their company name on the label and is the guarantor.

14545. "Manure" means any substances composed primarily of animal excrement, plant remains, or mixtures of those substances.

14546. "Micronutrients" means boron, chlorine, cobalt, copper, iron, manganese, molybdenum, sodium, or zinc, alone or in any combination.

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14547. "Mixed fertilizer" is a commercial fertilizer containing any combination or mixture of fertilizing materials.

14548. "Natural organic fertilizer" means materials derived from either plant or animal products containing one or more nutrients other than carbon, hydrogen, and oxygen, which are essential for plant growth, which may be subjected to biological degradation processes under normal conditions of aging, rainfall, sun-curing, air drying, composting, rotting, enzymatic, or anaerobic/aerobic bacterial action, or any combination of these, which shall not be mixed with synthetic materials or changed in any physical or chemical manner from their initial state except by physical manipulations such as drying, cooking, chopping, grinding, shredding, or pelleting.

14549. "Noncommercial use" means materials used primarily for application to lawns, shrubbery, flowers, trees, or where there is no crop for commercial value or economic purpose, excluding golf courses, cemeteries, and nurseries.

14550. "Official sample" means any sample of fertilizing material taken by an agent of the department and designated as "official" by the department.

14550.5. "Organic input material" means any bulk or packaged commercial fertilizer, agricultural mineral, auxiliary soil and plant substance, specialty fertilizer, or soil amendment, excluding pesticides, that is to be used in organic crop and food production and that complies with the requirements of the National Organic Program standards, as specified in Part 205 (commencing with Section 205.1) of Subchapter M of Chapter I of Subtitle B of Title 7 of the Code of Federal Regulations.

14551. "Packaged" means a fertilizing material distributed in packaged form or in a container containing equal to or less than 50 kilograms or 110 pounds.

14552. "Packaged soil amendment" means any substance distributed for the purpose of promoting plant growth or improving the quality of crops by conditioning soils solely through physical means. It includes all of the following:

(a) Hay.

(b) Straw.

(c) Peat moss.

(d) Leaf mold.

(e) Sand.

(f) Wood products.

(g) Any product or mixture of products intended for use as a potting medium, planting mix, or soilless growing media.

(h) Manures sold without guarantees for plant nutrients.

(i) Any other substance or product which is intended for use solely because of its physical properties.

14553. "Percent or percentage" means percentage by weight.

14554. "Person" means individual, partnership, association, firm, limited liability company, or corporation who assumes responsibility for the product.

14555. "Plant" means any business location where fertilizing materials are manufactured, sold, or stored for later sale, except storage of packaged materials on premises operated exclusively as a public warehouse.

14556. "Primary plant nutrient" means nitrogen (N), available phosphoric acid (P2O5), or soluble potash (K2O).

14557. "Provisional registration" means that under certain circumstances, a label for renewal on an auxiliary soil and plant substance, packaged agricultural mineral, packaged soil amendment, organic input material, or specialty fertilizer, alone or in any combination, may be registered for a limited period of time while labels are being corrected and reprinted or during registration renewal.

14558. "Registrant" means any person who has registered a packaged agricultural mineral, auxiliary soil and plant substance, packaged soil amendment, organic input material, or specialty fertilizer.

14559. "Secondary plant nutrient" means calcium, magnesium, or sulfur, alone or in any combination.

14559.5. "Secretary" means the Secretary of Food and Agriculture.

14560. "Sewage sludge" means the solid material resulting from the treatment of waste water of residential or municipal sewage systems.

14561. "Soil conditioners" means polyelectrolytes, such as complex vinyl and acrylic compounds and certain cellulose and lignin derivatives, which tend to agglomerate soil colloids and produce a crumb structure in the soil and increase the permeability of the soil to air and water and increase its resistance to crusting when it dries out.

14562. "Soilless growing medium" means a medium of an inorganic substance, such as sand or gravel, or in a soilless organic material such as sphagnum peat or pine bark, and periodically watered with a primary or secondary plant nutrient or micronutrient solution, or both.

14563. "Specialty fertilizer" means packaged commercial fertilizer labeled for home

gardens, lawns, shrubbery, flowers, and other similar noncommercial uses. These products may contain less than 5 percent nitrogen (N), available phosphoric acid (P2O5), or soluble potash (K2 O), singly or collectively, detectable by chemical methods.

14564. "Ton" means a net weight of 2,000 pounds avoirdupois.

Article 3. Fertilizer Inspection Advisory Board [Sections 14581 – 14586]

14581. There is, in the department, a Fertilizer Inspection Advisory Board consisting of nine persons appointed by the secretary, eight of whom shall be licensed under this chapter and subject to the payment of the inspection fee in accordance with this chapter, and one of whom shall be a public member. The members of the board shall receive no compensation, but are entitled to payment of necessary traveling expenses in accordance with the rules of the Department of Human Resources. These expenses shall be paid out of appropriations made to the department pursuant to this chapter.

14582. The term of office of a member of the board is three years. The initial board shall consist of, three members appointed for a term of three years, three members appointed for a term of two years, and three members appointed for a term of one year. Thereafter, appointments shall be for full three-year terms. Vacancies shall be filled for the duration of an unexpired term.

14583. The board shall be advisory to the secretary and may make recommendations on all matters pertaining to this chapter, including, but not limited to, the inspection and enforcement program, research and education, the annual budget, necessary fees to provide adequate inspection services, and regulations required to accomplish the purposes of this chapter.

14583.5. (a) The secretary, by January 1, 2012, and in consultation with the board, shall review the definition of organic input materials in Section 14550.5 and identify oversight and implementation issues that may arise or have arisen on account of that definition. The review shall also include an examination of materials not currently regulated under this definition that may warrant oversight by the department so as to protect the state's agricultural industry, including the organic industry, and recommendations for any necessary statutory changes.

(b) The secretary shall post the review required pursuant to subdivision (a) in a report on the Internet Web site of the department.

14584. The board shall elect a chairperson and other officers as it deems advisable.

14585. The board shall meet at the call of the chairperson or the secretary, or at the request of any five members of the board. The board shall meet at least once a year.

14586. The secretary shall accept the recommendations of the advisory board

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pertaining to subdivision (b) of Section 14611 if he or she finds them to be practicable and in the interests of the fertilizer industry and the public. If the secretary does not accept the recommendations of the advisory board, or any part thereof, the secretary shall provide the board with a written statement within 15 working days of making his or her decision stating the reasons for not accepting the recommendations, or any part thereof.

Article 4. Licensing [Sections 14591 – 14593]

14591. (a) Every person who manufactures or distributes fertilizing materials shall, before he or she engages in the activity, obtain a license from the secretary for each plant and business location that he or she operates. Prior to issuing a license, the secretary shall require verification that the applicant is a manufacturer or distributor of fertilizing material compliant with this chapter. All licenses shall be renewed in January of each odd-numbered year, and shall be valid until December 31 of the following even-numbered year, if issued in January of that same year. However, a person who only distributes or who makes retail sales of packaged agricultural minerals, packaged commercial fertilizers, packaged soil amendments, organic input material, or packaged auxiliary soil and plant substances, alone or in any combination, which bear the registered label of another licensed person, is not required to obtain the license.

(b) Every person who manufactures or distributes, or intends to manufacture or distribute, ammonium nitrate as defined in Section 14512.5, in this state, shall inform the secretary of that activity or intent when applying for a license. The license obtained by that person shall identify him or her as a manufacturer or distributor of ammonium nitrate.

(c) The license fee shall not exceed three hundred dollars ($300). The secretary may, based on the findings and recommendations of the board, reduce the license fee to a lower rate that provides sufficient revenue to carry out this chapter.

14592. A violation of this article is an infraction punishable by a fine of not more than five hundred dollars ($500). A second or subsequent violation of this article is a misdemeanor punishable by a fine of not less than one hundred dollars ($100) and not more than one thousand dollars ($1,000).

14593. The license shall expire on December 31, of an even-numbered year. Each application for renewal shall be accompanied by a fee not to exceed two hundred dollars ($200) for each plant or business location which a person operates. If a license is not renewed within one calendar month following expiration, a penalty of fifty dollars ($50) shall be added to the fee and an additional penalty of fifty dollars ($50) shall be added for each succeeding calendar month the business location remains unlicensed. The total penalty, however, shall not exceed 100 percent of the original amount due.

Article 5. Registration [Sections 14601 – 14603]

14601. (a) Each differing label, other than weight or package size, such as changes in the guaranteed analysis, derivation statement, or anything that implies a different product, for specialty fertilizer, packaged agricultural mineral, auxiliary soil and plant substance, organic input material, and packaged soil amendment shall be registered. The department may develop a schedule for all registrations to be submitted to the department for approval, and registrations shall be valid for two years. The registration fee shall not exceed two hundred dollars ($200) per product, except for organic input material.

(b) Notwithstanding subdivision (a), the registration fee for organic input material shall not exceed five hundred dollars ($500) per product, as the registration of organic input material labels require additional departmental resources and review time to ensure that nutrient guarantees and claims are scientifically feasible and meet National Organic Program standards. Funds generated from the registration of organic input material shall be deposited into the Organic Input Materials Account in the Department of Food and Agriculture Fund and, notwithstanding Section 221, shall be available upon appropriation by the Legislature.

(c) The secretary may, based on the findings and recommendations of the board, reduce the registration fees to a lower rate that provides sufficient revenue to carry out this chapter.

(d) Registrations may not be issued without a current license.

(e) The secretary may require proof of labeling statements and other claims made for any specialty fertilizer, agricultural mineral, packaged soil amendment, organic input material, or auxiliary soil and plant substance, before the secretary registers any such product. As evidence of proof, the secretary may rely on experimental data, evaluations, or advice furnished by scientists, including scientists affiliated with the University of California, and may accept or reject additional sources of proof in the evaluation of any fertilizing material. In all cases, experimental proof shall relate to conditions in California under which the product is intended for use.

(f) The secretary may perform site inspections of organic input material manufacturing processes used to validate label nutrient guarantees, claims, and compliance with National Organic Program standards giving priority to inspecting high-risk products and manufacturers. The department may accept inspections performed by a third-party organization approved by the secretary for organic input material manufacturers. All inspection records obtained by a contracted third-party organization shall be made available to the secretary upon request. When a contracted third-party organization is conducting a site inspection, the organization shall notify the department of when the inspection is going to take place no less than 72 hours in advance of the inspection. Department representatives may be present at the inspection.

(g) (1) The secretary, after hearing, may cancel the registration of, or refuse to register, any specialty fertilizer, packaged agricultural mineral, packaged soil

amendment, organic input material, or auxiliary soil and plant substance, which the secretary determines is detrimental or injurious to plants, animals, public safety, or the environment when it is applied as directed, which is known to be of little or no value for the purpose for which it is intended, or for which any false or misleading claim is made or implied. The secretary may cancel the registration of any product of any person who violates this chapter.

(2) The proceedings to determine whether to cancel or refuse registration of any of those products shall be conducted pursuant to Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code. The secretary shall have all the powers that are granted pursuant to Chapter 5.

14602. A violation of this article is an infraction punishable by a fine of not more than five hundred dollars ($500). A second or subsequent violation of this article is a misdemeanor punishable by a fine of not less than one hundred dollars ($100) and not more than one thousand dollars ($1,000).

14603. Each application for renewal shall be accompanied by a fee not to exceed two hundred dollars ($200) for each product label. If a registration is not renewed within one calendar month following expiration, a penalty of fifty dollars ($50) per product label shall be added to the fee.

14604. The secretary may grant a provisional registration for a period not exceeding six months for a registered product undergoing renewal. All fees shall be paid before the issuance of any provisional registration.

Article 6. Inspection Fees [Sections 14611 – 14613]

14611. (a) A licensee whose name appears on the label who sells or distributes bulk fertilizing materials, as defined in Sections 14517 and 14533, to unlicensed purchasers, shall pay to the secretary an assessment not to exceed two mills ($0.002) per dollar of sales for all fertilizing materials. A licensee whose name appears on the label of packaged fertilizing materials, as defined in Sections 14533 and 14551, shall pay to the secretary an assessment not to exceed two mills ($0.002) per dollar of sales. The secretary may, based on the findings and recommendations of the board, reduce the assessment rate to a lower rate that provides sufficient revenue to carry out this chapter.

(b) In addition to the assessment provided in subdivision (a), the secretary may impose an assessment in an amount not to exceed one mill ($0.001) per dollar of sales for all sales of fertilizing materials, to provide funding for research and education regarding the use and handling of fertilizing material, including, but not limited to, support for University of California Cooperative Extension, the California resource conservation districts, other California institutions of postsecondary education, or other qualified entities to develop programs in the following areas:

(1) Technical education for users of fertilizer materials in the development and

implementation of nutrient management projects that result in more agronomically sound uses of fertilizer materials and minimize the environmental impacts of fertilizer use, including, but not limited to, nitrates in groundwater and emissions of greenhouse gases resulting from fertilizer use.

(2) Research to improve nutrient management practices resulting in more agronomically sound uses of fertilizer materials and to minimize the environmental impacts of fertilizer use, including, but not limited to, nitrates in groundwater and emissions of greenhouse gases resulting from fertilizer use.

(3) Education to increase awareness of more agronomically sound use of fertilizer materials to reduce the environmental impacts resulting from the overuse or inefficient use of fertilizing materials.

14612. Each licensee shall maintain in this state, or with the secretary's permission, at another location, an accurate record of all transactions subject to assessment. These records shall be maintained for a period of not less than three years following the transaction and are subject to audit by the secretary.

14612.5. (a) Every licensee that manufactures, distributes, or sells ammonium nitrate, as defined in Section 14512.5, shall maintain in this state, or with the secretary's permission, at another location, all of the following information with respect to sales of ammonium nitrate:

(1) The names, addresses, and driver's license and telephone numbers of purchasers. The name and address of each purchaser shall be verified against a valid California driver's license, unless the fertilizer is shipped to a wholesale purchaser outside of the state.

(2) The date of each sale.

(3) The total amount of material sold.

(b) The information collected by licensees pursuant to subdivision (a) shall be kept for a period of at least three years and shall be made available only to the secretary or law enforcement officials upon request.

14613. The payment required by Section 14611, together with a form containing information prescribed by the secretary, shall be made quarterly within one calendar month after March 31, June 30, September 30, and December 31 of each year, and that form shall be submitted on or before those dates even if no fertilizer materials are sold. For any delinquency in making the payment, or any deficiency in payment, the director shall add a penalty of 15 percent to the delinquent payment. Any delinquency which is more than 90 days past due is a cause for cancellation of the license.

Article 7. Tonnage Reports [Sections 14621 – 14623]

14621. The last licensee selling or distributing fertilizing material shall submit a tonnage report, on a form or a computer printout format approved by the secretary, containing information on shipments received or deliveries made during specified periods designated by the secretary.

14622. (a) The secretary shall publish, at least annually, a tonnage report. The secretary shall distribute the report and may charge a fee to cover the actual cost of publishing and distributing the report.

(b) Any information furnished to the secretary under this chapter shall not be disclosed in such a way as to divulge the business practices of any licensee.

14623. The tonnage report shall be submitted to the secretary semiannually not later than January 31 and July 31 of each year. The secretary shall impose a penalty in the amount of two hundred dollars ($200) on any person who does not submit the report on or before those dates. Any tonnage report that is more than 90 days past due is a cause for revocation of the license.

Article 8. Labels [Sections 14631 – 14631]

14631. Every lot, parcel, or package of fertilizing material distributed into or within this state shall have attached to it, or the shipment shall be physically accompanied by, a label as required by the secretary, by regulation. The secretary may require proof of labeling statements and claims made for any fertilizing material. As evidence of proof, the secretary may rely on experimental data, evaluations, or advice furnished by scientists, including scientists affiliated with the University of California, and may accept or reject additional sources of proof. The secretary shall cancel the approval of, or refuse to approve, a fertilizing material label if the secretary determines that adequate proof of label claims does not exist. The secretary, after hearing, may cancel the license of any person who distributes a fertilizing material with a label for which approval has been canceled or a label that has not been approved by the secretary.

Article 9. Inspection, Sampling And Analysis [Sections 14641 – 14650]

14641. The secretary shall have free access at reasonable times to all records, premises, production processes, or conveyances that are used in the manufacture, transportation, importation, distribution, storage, or application of any fertilizing material.

14642. The secretary shall, at the times and to the extent necessary for the enforcement of this chapter, do all of the following:

(a) Take samples of any substance.

(b) Make analyses or examinations of any substance.

(c) Conduct investigations concerning the use, sale, adulteration, or misbranding of any substance.

(d) Inspect the fertilizing material manufacturing facilities and take samples at various stages of production to verify label and labeling claims and production processes.

14643. In determining the percentage of component parts of any substance for the purpose of proper labeling, registration, or determining compliance with representations, all analyses shall be made according to a method determined by the secretary.

14644. The secretary shall publish, at least annually, the results of examinations or chemical analyses of official samples of commercial fertilizer and agricultural minerals, and any additional information the secretary deems necessary.

14645. The secretary may take a sample for analysis from any lot of fertilizing material which is in the possession of any producer, manufacturer, importer, agent, dealer, or user. The sample shall be taken pursuant to regulations adopted by the secretary.

14646. The secretary shall establish sampling procedures by regulation.

14647. Upon the analysis of a sample of fertilizing material, the secretary shall issue a report showing the findings and indicating that the product has met the guarantee or was found to be deficient. However, the secretary, in determining whether any product is deficient in guarantee or misrepresented, may establish, by regulation, tolerances that provide allowances for variations that occur in the taking, preparation, and analysis of an official sample.

14648. In any action, civil or criminal, in any court in this state, a laboratory report from the secretary which states the results of any analysis, reported to be made pursuant to this chapter, shall be prima facie evidence of all of the following:

(a) That the sample which is described in the laboratory report was properly analyzed.

(b) That the sample was taken pursuant to this chapter.

(c) That the substances analyzed contained the component parts which are stated in the laboratory report.

(d) That the sample was taken from the lots, parcels, or packages which are described in the laboratory report.

14649. (a) It is unlawful for the owner of a plant, crop, or commodity to knowingly treat or apply to that plant, crop, or commodity, or cause that plant, crop, or commodity to be treated or applied, with a fertilizer that was stolen or otherwise acquired by illegal

means.

(b) The owner of a crop, who is found by a court to have violated this section, in addition to any other penalties imposed by a court, shall be subject to a fine of ten thousand dollars ($10,000) plus an amount equal to one-half the value of the crop on which the illegally obtained fertilizer was applied.

(c) For purposes of this section, "one-half the value of the crop" means one-half the market value of the crop that was actually treated with the illegally obtained fertilizer as determined by the actual sale of the crop or, if the crop is not actually sold, as determined by the director based on an average of the typical market value for such a crop sold in the normal channels of trade in the year in which the crop was produced and in the preceding two years.

(d) Moneys received as a result of fines and penalties imposed pursuant to this section shall be divided and distributed as follows:

(1) Fifty percent to the county in which the case was brought to court or in which a court approved settlement of the matter was negotiated.

(2) Twenty-five percent to the office of the county agricultural commissioner.

(3) Twenty-five percent to the department.

14650. (a) Any person who is licensed pursuant to this code and who is found by a court to have knowingly sold, applied, or provided fertilizers that were stolen or otherwise obtained illegally, in addition to any other penalty that may be imposed, shall have his or her license or licenses suspended for a minimum of 18 months.

(b) This section does not apply to a licensee whose employee or agent is found by a court to have knowingly sold, applied, or provided fertilizers that were stolen or otherwise obtained illegally, unless the licensee had actual knowledge of that conduct.

Article 10. Violations [Sections 14651 – 14661]

14651. (a) Unless otherwise specified in this chapter, any violation of this chapter, or the regulations adopted pursuant to this chapter, is a misdemeanor, punishable by a fine of not more than one thousand dollars ($1,000) for the first violation and not less than one thousand dollars ($1,000) for each subsequent violation.

(b) The secretary may, after hearing, refuse to issue or renew, or may suspend or revoke, a license or registration for any violation of this chapter or any regulation that is adopted pursuant to this chapter.

(c) Upon calling a hearing, the secretary shall hand deliver or mail a notice of the hearing to the licensee or registrant specifying the time and place of the hearing at least

10 days prior to the hearing. The hearing officer may do any of the following:

(1) Administer oaths and take testimony.

(2) Issue subpoenas requiring the attendance of the licensee, registrant, or witnesses, together with books, records, memorandums, papers, and all other documents that may be pertinent to the case.

(3) Compel from the licensee or registrant and any witness the disclosure of all facts known to him or her regarding the case. In no instance shall any employee of Feed, Fertilizer, Livestock Drugs and Egg Regulatory Services serve as the hearing officer in any hearing conducted pursuant to this section.

(d) Any person who is denied a license, whose license is not renewed, or whose license is suspended or revoked pursuant to this section may appeal to the secretary.

14651.5. (a) The department shall levy an administrative penalty against a person who violates this chapter in an amount of not more than five thousand dollars ($5,000) for each violation. The amount of the penalty assessed for each violation shall be based upon the nature of the violation, the seriousness of the effect of the violation upon the effectuation of the purposes and provisions of this chapter, and the impact of the penalty on the violator, including the deterrent effect on future violations.

(b) Upon a finding that the violation is minor or unintentional, in lieu of an administrative penalty, the secretary may issue a notice of warning.

(c)) A person against whom an administrative penalty is levied shall be afforded an opportunity for a hearing before the secretary, upon a request made within 30 days after the date of issuance of the notice of penalty. At the hearing, the person shall be given the right to present evidence on his or her own behalf. If a hearing is not requested, the administrative penalty shall constitute a final and nonreviewable order.

(d) If a hearing is held, review of the decision of the secretary may be sought by the person against whom the administrative penalty is levied within 30 days of the date of the final order of the secretary pursuant to Section 1094.5 of the Code of Civil Procedure.

(e) After completion of the hearing procedure pursuant to subdivision (c), the secretary may file a certified copy of the department's final decision that directs payment of an administrative penalty, and if applicable, any order denying a petition for a writ of administrative mandamus, with the clerk of the superior court of any county that has jurisdiction over the matter. Judgment shall be entered immediately by the clerk in conformity with the decision or order. Fees shall not be charged by the clerk of the superior court for performance of any official services required in connection with the entry of judgment and the satisfaction of the judgment pursuant to this section.

14652. (a) It is unlawful for any person to manufacture or distribute in this state any fertilizing material without complying with this chapter or the regulations adopted pursuant to this chapter.

(b) It is unlawful for any person to adulterate, misbrand, or alter any fertilizing material with the result that the fertilizing material would be inconsistent with the label claims. Any violation of this subdivision is a misdemeanor punishable by a fine as follows:

(1) Not more than five thousand dollars ($5,000) for the first violation that is not a knowing violation.

(2) Not more than fifteen thousand dollars ($15,000) for each subsequent unknowing violation.

(3) Not less than fifteen thousand dollars ($15,000) for each knowing violation.

(c) Any person found in violation of subdivision (b) of this section or subdivision (e) of Section 14682 may also be prohibited by the secretary from obtaining a license to sell organic input materials for three years.

14653. The secretary may seize and hold any lot of fertilizing material which he or she has reasonable cause to believe is in violation of this chapter or the regulations adopted pursuant to this chapter.

14654. If the secretary seizes any lot of fertilizing material, he or she shall immediately issue a hold order to the person that has control of that material. The secretary may affix to that lot or package of the material a warning tag which states that the lot is subject to a hold order.

14655. (a) Any lot of fertilizing material for which a hold order or notice is issued shall be held by the person having control of the material and shall not be distributed or moved except under the specific directions of the secretary, pending final disposition pursuant to this chapter. This does not prevent the person who has control of the material from inspecting any seized material or from taking a reasonable sample for evidence while in the presence of a person designated by the secretary.

(b) The movement, distribution, or sale of all or part of any product by the person having control of the material that has been quarantined by the secretary, unless the movement, distribution, or sale has the prior approval of the secretary, is a violation subject to a civil penalty as specified in Section 14651.5, or a misdemeanor punishable by a fine of not more than five thousand dollars ($5,000). A second or subsequent violation of this subdivision is a misdemeanor punishable by a fine of not less than ten thousand dollars ($10,000).

14656. Upon demand of the person who has control of the seized fertilizing material, and

within 10 days of sampling by the secretary, a subsample shall be returned from the state laboratory to the person in control of the fertilizing material.

14657. If the seized and held lot, as determined by the secretary's analysis, is not in violation of this chapter, the secretary shall immediately release the seized and held lot and remove the hold order.

14658. If the seized and held lot is found to be in violation of this chapter, the secretary shall take either of the following actions:

(a) Continue to hold the lot until such time as the requirements of this chapter have been complied with, at which time the lot shall be released.

(b) Issue orders for the disposal of the lot in a manner specified by the secretary.

14659. The person who has control of a seized or held lot that is found to be in violation of this chapter may appeal the result of the analysis to the secretary, in writing, within 15 days of receiving the notice of violation. Upon receipt of that appeal, the secretary shall take a further sample of the lot in question for analysis. The cost of sampling and analysis shall be at the expense of the person who requests the further sample. The findings of the analysis on appeal shall be conclusive.

14660. The authority for the issuance of citations is limited to the violations of Sections 14591, 14601, 14631, 14651, and 14655. The secretary shall adopt procedures for the issuance of citations and penalties, upon the recommendation of the board. Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code does not apply to the procedures adopted by the secretary pursuant to this section.

14661. (a) The department shall be entitled to receive reimbursement from any person who is found in violation of this chapter for any reasonable attorney's fees and other related costs, including, but not limited to, investigative costs, involved in enforcement of this chapter.

(b) The department shall use all funds received pursuant to this chapter for the purposes of this chapter.

Article 11. Procedure for Prosecution [Sections 14671 – 14672]

14671. In addition to the remedies provided in this chapter, the department may bring an action in superior court and the court may grant a temporary or permanent injunction restraining any person from violating this chapter or the regulations adopted pursuant to this chapter. Any proceeding under this section shall conform to the requirements of Chapter 3 (commencing with Section 525) of Title 7 of Part 2 of the Code of Civil Procedure. The department shall not, however, be required to allege facts necessary to show or tending to show irreparable damage or loss. The court may require any acts or

course of conduct necessary to effectuate the purposes of this chapter.

14672. Nothing in this chapter requires the secretary to report for prosecution or to institute injunctive proceedings for any minor violation of this chapter whenever the secretary believes that the public interest would be adequately served by a suitable written notice of warning and compliance with the notice.

Article 12. Misbranding and Adulteration [Sections 14681 – 14682]

14681. No person shall distribute misbranded fertilizing materials. A fertilizing material shall be deemed to be misbranded under any of the following conditions:

(a) If its labeling is false or misleading in any particular way.

(b) If it is distributed under the name of another fertilizing material, as determined by the department.

(c) If it is not labeled as required by regulations adopted pursuant to this chapter.

(d) If it purports to be, or is represented as, a fertilizing material, or is represented as containing a primary or secondary plant nutrient or micronutrients, or both, unless the plant nutrients conform to the definition of identity, if any, prescribed by regulation. In adopting these regulations, due regard shall be given to commonly accepted definitions and official fertilizer terms such as those prescribed by the Association of American Plant Food Control Officials.

14682. No person shall distribute an adulterated fertilizing material. A fertilizing material shall be deemed to be adulterated under any of the following conditions:

(a) If it contains any deleterious or harmful ingredient in sufficient amounts to render it injurious to beneficial plant life when applied in accordance with directions for use on the label, or if adequate warning statements or directions for use that may be necessary to protect plant life are not indicated on the label.

(b) If its composition falls below or differs from that which it is purported to possess by its labeling.

(c) If it contains unwanted crop seed or weed seed.

(d) If it is a threat to public safety.

(e) If an organic input material contains ingredients that, in type or amount, do not comply with the requirements of the National Organic Program standards, as specified in Part 205 (commencing with Section 205.1) of Subchapter M of Chapter I of Subtitle B of Title 7 of the Code of Federal Regulations.

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TITLE 3. CALIFORNIA CODE OF REGULATIONS
PLANT INDUSTRY

SECTIONS 2300 THROUGH 2326

ARTICLE 1. STANDARDS AND LABELING

§ 2300. Fertilizing Materials - General Provisions.

(a) Labels of fertilizing materials, shall comply with the requirements of this article.

(b) Efficacy data, which may be required as stated in Sections 14601 and 14631 of the Food and Agricultural Code, is data required to demonstrate the product's effectiveness when used as directed for all label claims. The data shall be obtained under California environmental use conditions or in areas that have essentially the same environmental use conditions.

(c) All guarantees shall be based on an Association of Official Analytical Chemists (AOAC) laboratory method or when no AOAC method is available, a method developed for specific analyses by the Department shall be used.

(d) The guaranteed analysis must be stated on an "as is" basis at time of sale or delivery to wholesale and retail customers.

(e) "Zero" guarantees shall not appear in the guaranteed analysis statement.

(f) Brand names, trademarks and tradenames are prohibited in the derivation statement or list of ingredients. They may appear as part of the product name in an area of the label separate from the list of ingredients or the derivation statement. However, trademarks and tradenames may not be similar to that of a recognized fertilizing material.

(g) The statement "State of California approved" or other indication of official approval is prohibited in labeling and advertising unless allowed for organic input material.

(1) Organic input material registered in accordance with Title 3, Section 2320.2 et seq. may reflect OR bear the following logos:

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(2) The logo must replicate the form and design referenced in Section 2300(g)(1) and, if used, must be printed legibly and conspicuously.

(h) A warning or caution statement shall appear on the label of any commercial fertilizer or agricultural mineral product which contains 0.1 percent or more by weight of boron in water soluble form. This statement shall carry the word "WARNING," "CAUTION," "ATTENTION," or "NOTICE," conspicuously displayed, shall state the crop(s) for which the fertilizing material is to be used or state that the use of the fertilizing material on any crops other than those recommended may result in serious injury to the crop(s).

(i) Except for products labeled only for indoor or hydroponic use, a warning or caution statement shall appear on the label of any commercial fertilizer or agricultural mineral product which contains 0.001 percent or more by weight of molybdenum (Mo). This statement shall carry the word "WARNING," "CAUTION," "ATTENTION," or "NOTICE," conspicuously displayed and the statement that the application of fertilizing materials containing molybdenum (Mo) may result in forage crops containing levels of molybdenum (Mo) which are toxic to ruminant animals.

(j) When the name of a fertilizing material ingredient appears on the label, that ingredient shall be represented in the guaranteed analysis statement and derivation statement, or statement of composition or list of ingredients.

(k) The manufacturer of fertilizing materials shall provide information regarding a product's composition to the Secretary:

(1) For fertilizing materials requiring registration, information regarding the product's composition shall accompany the Fertilizing Material Registration Application.

(2) For registered fertilizing materials, the manufacturer shall notify the Secretary of any changes in the information on file regarding the product's composition within 30 days of the change.

(3) For fertilizing materials that do not require registration, the manufacturer shall provide information regarding the product's composition upon request by the Secretary.

(4) For all fertilizing materials, the manufacturer may reference previously submitted information in compliance with subsections (k)(1), (k)(2) and (k)(3) but only with permission from the manufacturer who submitted the original information.

(5) For all fertilizing materials whose production process allows for alternative inert ingredients, a list of alternative inert ingredients may be submitted when providing the Secretary information regarding composition as required by subsections (k)(1), (k)(2) and (k)(3).

(l) The manufacturer shall submit the following information on the composition of

fertilizing materials:

(1) The name of each active and inactive ingredient and its concentration in percentage by weight. The ingredient shall be identified using its chemical or substance name according to the Chemical Abstract Society (CAS) nomenclature (including the CAS Registry Number) or its common, generally recognized name. For products whose net content is expressed by volume on its label, the ingredients' concentration information may be submitted based on volume as long as the approximate bulk density information is also included.

(2) When the information submitted in accordance to subsection (1)(1) is not sufficient to verify the safety or efficacy, the Secretary may require the manufacturer to provide additional ingredient information including but not limited to:

(A) The purpose of each ingredient, active or inactive.

(B) The source of each ingredient, including the manufacturer's and/or distributor's contact information and country of origin.

(C) The Material Safety Data Sheet (MSDS) if applicable, or any other technical information in support of safety.

(D) The physical or chemical characteristic of each ingredient.

(E) A description of the manufacturing process.

(F) The impurities associated with each ingredient. The term "impurity" means any substance in the fertilizing material other than an active ingredient or an inert ingredient, including but not limited to non-reactive ingredients, side-reaction products, contaminants, and degradation products.

(G) A valid analytical method for each ingredient where applicable.

(m) Product labels may be re-evaluated to ensure compliance with current labeling laws and regulations. Revisions to approved product labels may be required at registration renewal.

Note: Authority cited: Sections 407, 14502 and 14631, Food and Agricultural Code. Reference: Sections 14501(b), 14502, 14601, 14631, 14641, 14642 and 14643, Food and Agricultural Code.

§ 2300.1. Definitions.

(a) The term "trade secret" means any data and/or information that discloses:

(1) The manufacturing or quality control processes, manufacturing facility or

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equipment

(2) The identity or percentage quantity of any deliberately added ingredients other than active ingredients.

(3) Any business practice that is otherwise considered as trade secrets under California Government Code Section 6254.7(d).

All information concerning efficacy, including but not limited to the objectives, methodology, results, or significance of any test or experiment performed on or with a fertilizing material, and any information concerning the effects of such fertilizing material's action on the environment or human or animal health, shall not be considered "trade secrets."

(b) The term "active ingredient" means any agent responsible for the intended beneficial purpose, including but not limited to: provide primary plant nutrients, secondary nutrients or micronutrients; correct soil conditions through chemical and biological affects; enhance plant's growth, vigor, quality or size through chemical, biochemical, or biological change; or amends the soil through physical or chemical means.

(c) The term "inert ingredient" means a substance, other than an active ingredient, which is intentionally included in a fertilizing material product.

(d) The term "custom blend" means a fertilizing material blended according to specifications provided to a blender in a soil test nutrient recommendation or to meet the specific consumer (end user) request(s) prior to blending.

(e) The term "blender" means any person or system engaged in the business of blending fertilizing material.

(f) The term "lot" means an identifiable quantity of fertilizing material up to and including the amount represented by a weight certificate; or that bears an identical production code and/or date or, in the absence of either a production code or date, any group of containers of the same size, product name, and manufacturer stored at the same location.

(g) The term "display panel" means the primary part of a label that is designed to be displayed, presented, or shown under normal and customary conditions of display and purchase.

(h) The term "public warehouse" means any place designated for the storage of goods, where its services are offered to any business or person, and where ownership does not engage in the sales of any fertilizing materials being stored at the warehouse.

(i) The term "fraud" means a knowing misrepresentation of the truth or concealment of a material fact to induce another person to act to his or her detriment.

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(j) The term "willful misconduct" means unlawful behavior voluntarily and intentionally.

(k) The term "gross negligence" means a conscious, voluntary act or omission in reckless disregard of a legal duty and of the consequences to another person.

Note: Authority cited: Sections 407 and 14502, Food and Agricultural Code. Reference: Sections 14601 and 14631, Food and Agricultural Code; and Section 6254.7, Government Code.

§ 2300.2. Procedures for Claiming Protection of Trade Secrets.

To assert a claim of confidentiality, a manufacturer must clearly identify any information which he claims is entitled to be considered as trade secrets.

(a) Any data and information claimed by the manufacturer to be trade secrets under Section 2300.1(a) of Title 3 of the California Code of Regulations shall be submitted in accordance to the following procedures:

(1) Any items of information which, in the manufacturer's opinion, should be considered as trade secrets as defined in Section 2300.1(a), shall be removed from the body of information and submitted in a separate, confidential attachment marked with "Trade Secrets" on its cover page. The manufacturer waives the claim for consideration as trade secret for any item that remains in the body of information.

(2) A reference number shall be assigned to each item that is to be considered as a trade secret in the confidential attachment; the corresponding reference number shall be placed in the body of the submitted information where the item was removed.

(3) The page number(s) and the number of the line from where the trade secret item was removed along with the applicability of the definition of a trade secret (Section 2300.1(a)) shall be included for each trade secret claim in the confidential appendix.

(b) Statements of confidentiality shall accompany all submissions of information. The statement shall be accompanied by the name, title, signature of the manufacturer or his properly designated agent, and the date of signature.

(1) If claiming confidentiality, the following statement of confidentiality shall be submitted: "Information claimed confidential on the basis of its falling within the scope of the trade secret definition in Section 2300.1(a), has been removed to a confidential appendix, and is cited by cross-reference number in the body of the submitted information."

(2) If no claim of confidentiality is being made for the information/data submitted, or if no such information is contained in the submitted information, the following

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statement of confidentiality shall be submitted: "No claim of confidentiality is made for any information contained in this study on the basis of its falling under the definition of trade secret in Section 2300.1(a)."

Note: Authority cited: Sections 407 and 14502, Food and Agricultural Code. Reference: Sections 14601 and 14631, Food and Agricultural Code; and Section 6254.7, Government Code.

§ 2300.3. Conditions of Confidentiality.

Information considered as trade secrets and therefore confidential will be withheld from public disclosure unless the Secretary has determined that disclosure is necessary to protect against an unreasonable risk of injury to health or the environment.

(a) Designating information as trade secrets by the manufacturer does not automatically qualify them as trade secrets and therefore subject to confidentiality. Upon receipt of a Public Records Act request the Secretary will determine the validity of trade secret claims. If the Secretary determines that the information designated as a trade secret is, in fact a trade secret, that information will be treated as such and will be held in confidence.

(b) If the Secretary determines that information designated by the manufacturer as trade secrets does not qualify as such and proposes to release it for inspection, the Secretary shall notify the manufacturer in writing, to the address provided by the manufacturer as stated on the license application. The Secretary shall not thereafter release for inspection any designated information until 10 days after mailing notice to the manufacturer. During this period, the manufacturer may institute an action in an appropriate venue for judgment as to whether such information is subject to protection.

Note: Authority cited: Sections 407 and 14502, Food and Agricultural Code. Reference: Sections 14601 and 14631, Food and Agricultural Code; and Section 6254.7, Government Code.

§ 2300.5. Guaranteed Analysis. [Repealed]

Note: Authority cited: Sections 407 and 14502, Food and Agricultural Code. Reference: Section 14591, Food and Agricultural Code.

§ 2301. Use of Numerals to Describe the Guaranteed Analysis.

When any series of numerals are used in labeling of or in advertising to describe the formula or analysis, or in connection with the name, brand, or trademark, such numerals shall be arranged so that the first will be the guaranteed percentage of nitrogen; the second, the guaranteed percentage of available phosphoric acid; and the third, the guaranteed percentage of soluble potash. The guaranteed percentages shall be consistent with the guaranteed analysis.

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Note: Authority cited: Sections 407, 14502 and 14631, Food and Agricultural Code. Reference: Sections 14591 and 14631, Food and Agricultural Code.

§ 2302. Non-Nutritive Standards.

(a) Inorganic commercial fertilizer and agricultural mineral products shall not exceed the following standards for the non-nutrient metals arsenic, cadmium and lead:

(1) For each percent iron, manganese or zinc, the fertilizing material shall not exceed the following concentrations of non-nutrient metals: arsenic, 13 parts per million; cadmium, 12 parts per million; lead, 140 parts per million.

(2) For each percent available phosphate (P_2O_5), the fertilizing material shall not exceed the following concentrations of non-nutrient metals: arsenic, 2 parts per million; cadmium, 4 parts per million; lead, 20 parts per million.

(3) The concentration limits are applied as follows:

(A) For micronutrient materials with guaranteed available iron, manganese or zinc multiply the percentage of guaranteed micronutrient material (Minor Element) by the arsenic, cadmium and lead maximum concentrations as expressed in parts per million (ppm). Example: A 12% Iron product will have the following limits: arsenic, 156 parts per million (13 ppm X 12); cadmium, 144 parts per million (12 ppm X 12); and lead, 1,680 parts per million (140 ppm X 12).

(B) For phosphate (P_2O_5) materials multiply the guaranteed percentage of P_2O_5 by the arsenic, cadmium and lead maximum concentrations as expressed in parts per million (ppm). Example: A guaranteed available 52% (P_2O_5) phosphate product will have the following limits: arsenic 104 parts per million (2 ppm X 52); cadmium 208 parts per million (4 ppm X 52); and lead 1,040 parts per million (20 ppm X 52).

(4) For specialty fertilizers that guarantee less than 6% available phosphate (P_2O_5) but make no micronutrient claim, the maximum allowable concentrations of non-nutrient metals shall not exceed: arsenic, 10 parts per million; cadmium, 20 parts per million; and lead, 100 parts per million.

(5) For specialty fertilizers that guarantee less than 6% available phosphate (P_2O_5) and make a micronutrient claim, multiply the guaranteed percentage of micronutrient by the arsenic, cadmium and lead maximum concentrations as expressed in parts per million (ppm) and add the following values to that total: arsenic, 10 parts per million; cadmium, 20 parts per million; and lead 100 parts per million.

(6) The concentration limits are applied as follows:

(A) A guaranteed available 3% (P_2O_5) phosphate product with 2% guaranteed zinc will have the following limits. Example: arsenic, 36 parts per million (13 ppm X 2 zinc = 26 ppm + 10 ppm); cadmium, 44 parts per million (12 ppm X 2 zinc = 24 ppm + 20 ppm); and lead, 380 parts per million (140 ppm X 2 zinc = 280 ppm + 100 ppm).

(b) Waste and hazardous waste shall be defined as specified in Title 22, CCR Division 4.5, Chapter 11 - Identification and Listing of Hazardous Waste, commencing with Section 66261.1.

(c) Recyclable material used in fertilizing material manufacture shall meet all applicable requirements in the Code of Federal Regulations, Chapter 1, Title 40, Part 266, Subpart C - Recyclable Materials Used In a Manner Constituting Disposal, commencing with Section 266.20.

(d) Recyclable material used in fertilizing material manufacture shall be sampled and tested in accordance with procedures specified in Title 22, CCR, Division 4.5, Chapter 11 - Identification and Listing of Hazardous Waste, commencing with Section 66261.1.

(1) A copy of test results shall be submitted to the department for each source of recyclable material used in the manufacture of zinc, manganese or iron products utilized as a base fertilizing material ingredient. Additional test results shall not be required by the department unless the process or operation generating the recyclable material changes.

(e) No recyclable material may be used in fertilizing material manufacture if its use is denied pursuant to Title 22, CCR, Division 4.5, Chapter 16, Article 8.5 - Requirements for Management of Recyclable Materials Used in Agriculture, Section 66266.115.

(f) No recyclable hazardous waste may be used in fertilizing material manufacture unless the generator of such recyclable hazardous waste complies with Title 22, CCR, Division 4.5, Chapter 16, Article 8.5 - Requirements for Management of Recyclable Materials Used in Agriculture, commencing with Section 66266.115.

Note: Authority cited: Sections 407, 14502 and 14682, Food and Agriculture Code. Reference: Section 14682, Food and Agriculture Code.

§ 2303. Labeling Requirements.

The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code, shall include the following:

(a) Product name.

(b) Measurement.

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(1) Net weight, of dry materials (not required for soil amendments). US and metric units are required on dry materials, except those distributed with a weight certificate.

(2) Volume of organic input material bulk soil amendments, packaged soil amendments, and liquid materials. US and metric units are required on organic input material bulk soil amendments, packaged soil amendments, and liquid materials, except those distributed with a weight certificate.

(3) Density, (pounds per gallon at 68 degrees Fahrenheit), for bulk liquids only.

(c) Grade (for commercial fertilizer labels only).

(d) The licensee's name and address.

(e) Purpose of the product (for auxiliary soil and plant substances, packaged agricultural minerals, packaged soil amendments, and specialty fertilizers).

(f) Directions for use (for auxiliary soil and plant substances, packaged agricultural minerals, packaged soil amendments, and specialty fertilizers).

(g) The statement "NONPLANT FOOD INGREDIENT" printed in capital letters (for auxiliary soil and plant substance products).

(h) A statement of composition showing the percent of each active ingredient, which is the agent in a product primarily responsible for the intended effects (for auxiliary soil and plant substances) using the following format:

NONPLANT FOOD INGREDIENT(S):

X% Humic Acids (state the source of the humic acids)

X% Polymers (state the name of the specific polymer)

X% Wetting Agents (state the name of the specific wetting agent)

(i) A guaranteed analysis using the following format, terminology, and order presented:

GUARANTEED ANALYSIS:

(1) Total Nitrogen (N)....._____%
_____% Ammoniacal Nitrogen

_____% Nitrate Nitrogen

_____% Water Soluble Nitrogen or Other recognized and determinable forms of nitrogen

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_____% Water Insoluble Nitrogen

Available Phosphoric Acid (P2O5)..... _____%

Soluble Potash (K2O)..... _____%

(2) Secondary and micronutrient guarantee minimums. (if claimed)

Calcium (Ca).....1.0000%

Magnesium (Mg) 0.5000%

Sulfur (S).....1.0000%

Boron (B) 0.0200%

Chlorine (Cl) 0.1000%

Cobalt (Co).....0.0005%

Copper (Cu) 0.0500%

_____% Chelated Copper

Iron (Fe) 0.1000%

_____% Chelated Iron

Manganese (Mn) 0.0500%

_____% Chelated Manganese

Molybdenum (Mo).....0.0005%

Sodium (Na).....0.1000%

Zinc (Zn) 0.0500%

_____% Chelated Zinc

(3) Liming material guarantees: (if claimed)

Compound(s) composing material.....%

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(state specific compounds)

Calcium carbonate equivalent....._%

Sieve Analysis (BULK ONLY):
10 mesh....._____%
20 mesh....._____%
40 mesh....._____%
60 mesh....._____%

Moisture, maximum (BULK ONLY) ....__%

(4) Gypsum guarantees: (if claimed)

Calcium Sulfate Dihydrate (CaSO4·2H20).....X%

Calcium (Ca).....X%

Sulfur (S).....X%

(5) Gypsum equivalent guarantees: (if claimed)

Gypsum Equivalent.....X%

Calcium (Ca).....X%

Sulfur (S).....X%

(6) Other guarantees: (if claimed, and approved by the secretary)

(j) A derivation statement directly following the last nutrient guarantee (for commercial fertilizers and agricultural mineral labels).

(1) Abbreviations shall not appear in the derivation statement, with the exception of chelating agents.

(2) For liming materials, the derivation statement shall follow the last guarantee.

(k) A list of ingredients in decreasing amounts present (for packaged soil amendments and organic input material bulk soil amendments).

(l) The following format and guarantees, as applicable for the following products or ingredients, shall appear after the derivation statement of agricultural mineral and commercial fertilizer labels:

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ALSO CONTAINS NONPLANT FOOD INGREDIENT(S):

X% Humic Acids (state the source of the humic acids)

X% Polymers (state the name of the specific polymer - required for auxiliary soil and plant substances only)

X% Wetting Agents (state the name of the specific wetting agent on company letterhead and note if confidential - not required on the label)

(m) Additional information, other than secondary or micronutrient guarantees, shall not appear in the guaranteed analysis statement.

(n) The guarantees for the forms of nitrogen must add up to the total nitrogen guarantee claimed and are recommended in the order appearing in the format shown in section 2303(i)(1).

(o) Zeros are required before the decimal points when less than one percent.

(p) For packaged products, the information found in section 2303(a) through (o) shall either:

(1) Appear on the label, or

(2) Be printed on a tag and attached to the package. This information shall be in a conspicuous form.

(q) For bulk products, the information found in section 2303(a) through (o) shall be in written or printed form and shall accompany the delivery. This information shall be in a conspicuous form.

(r) The manufacturer of any base fertilizing material ingredient that claims iron, manganese, zinc or phosphates shall provide a guarantee statement that the product does not exceed standards established for arsenic, cadmium and lead.

(1) For purposes of the labeling guarantee, base fertilizing material ingredient shall be defined as phosphate, zinc, manganese, or iron products utilized singly or as material ingredient in blended or formulated fertilizing material products. Examples of such base fertilizing material ingredients include, but are not limited to, phosphoric acid, monoammonium phosphate, diammonium phosphate, zinc oxide, zinc sulfate, zinc from galvanizer skimmings, zinc from electric arc furnace dust, metallic zinc, refined zinc from the copper pickling process, zinc from circuit board recycling, iron II & III oxide, iron ore deposits, iron from recycling of bailing wire, rust or photographic operations, and manganese oxide.

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(2) The guarantee statement shall report in parts per million the maximum total concentration of arsenic, cadmium and lead in the base fertilizing material ingredient.

(s) Packaged product labels for commercial fertilizer and agricultural mineral products, with guarantees of available phosphoric acid, iron, manganese, or zinc, which are derived from inorganic sources, shall include either an informational statement of laboratory test results or provide an informational statement providing the maximum levels in parts per million of arsenic, cadmium, cobalt, copper, lead, mercury, molybdenum, nickel and selenium.

(1) In lieu of a statement on the label, the information may be provided by either of the following statements:

"Information regarding the contents and levels of metals in this product is available by calling 1- 800-XXX-XXXX."

Or

"Information regarding the contents and levels of metals in this product is available on the Internet at http://www.regulatory-info-xx.com." Each registrant shall substitute a unique alphanumeric identifier for "xx". This statement may be used only if the licensee establishes and maintains the Internet site; there is a clearly visible, direct hyperlink to a government web site; and, the Internet site contains no advertising or company-specific information. A government web site internet address on the label, or an address for a web site (such as the Association of American Plant Food Control Officials non-nutritive metals web site) that contains links to other state government non-nutritive metals information, is an acceptable alternative to a web site established and maintained by the licensee. All linked web sites shall contain no advertising or company-specific information.

(t) Testing methodology for the informational statement of laboratory test results shall conform to either sample preparation method 3050B or 3051 and conform to analysis methods as described in US EPA Publication SW-846 (Revision 3, December 1996), which is hereby incorporated by reference.

(1) The heavy metal testing results shall be no more than five (5) years old at the time of registration renewal approval.

(u) The publication of inaccurate information regarding the contents and levels of metals is a misbranding violation pursuant to Section 14681 of the Food and Agriculture Code.

(v) The secretary may accept definitions and official fertilizer terms listed in the most recent edition of the Association of American Plant Food Control Officials official publication.

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(w) A copy of the heavy metals analysis for the nine metals described in Section 2303 (s) shall be submitted to the secretary for any label that contains a link to the California website for heavy metals (https://apps1.cdfa.ca.gov/fertilizerproducts/).

Note: Authority cited: Sections 407, 14502, 14601 and 14631, Food and Agricultural Code. Reference: Section 14631, Food and Agricultural Code.

§ 2304. Biotics.

All fertilizing materials for which claims are made relating to organisms, enzymes or organism by-products are subject to the registration requirement of Section 14601 of the Food and Agricultural Code.

In addition to the information required by Section 14601 of the Food and Agricultural Code, the label of each product which contains organisms, enzymes, and other biologically active by-products of organisms for which claims are made shall state:

(a) Name of each species and strains as part of the statement of composition and name of each by-product, if claimed.

(b) (1) The percentage or number of viable units of each microorganism per cubic centimeter or per gram for dry material.

(2) The concentration in percentage of each enzyme or other organism by-products claimed.

(c) The expiration date for use.

(d) Storage conditions.

A generally accepted laboratory method for assaying the viable and attenuated units and the by-products claimed; and a copy of the analysis or alternate methods supporting proof of label claim, must be submitted with the registration application.

When used for the purpose intended, the product must not be pathogenic to plants or pathogenic to animals which may consume the treated plant. Biotic products are acceptable based on efficacy data.

Note: Authority cited: Sections 407, 14502, 14601 and 14631, Food and Agricultural Code. Reference: Sections 14601 and 14631, Food and Agricultural Code.

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§ 2305. Chelating Agents.

The label of each product for which a chelation claim is made shall state:

(a) The name of the chelating agent.

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(b) The percent of the guaranteed micronutrient content which is chelated, for example, in the following format:

Zinc (Zn)....._____%

_____% Chelated Zinc

Note: Authority cited: Sections 407, 14502 and 14631, Food and Agricultural Code. Reference: Sections 14502 and 14631, Food and Agricultural Code.

§ 2306. Fish Emulsion.

When a product is labeled as fish emulsion, it shall contain a minimum of 40 percent total solids.

Note: Authority cited: Sections 407, 14502 and 14631, Food and Agricultural Code. Reference: Sections 14502 and 14631, Food and Agricultural Code.

§ 2307. Hydroponics, Continuous Liquid Feed Products, Ready-to-Use Foliar Products, and Planting Mixes or Potting Mediums Labeled for Container Gardening.

The minimum percentages acceptable for secondary nutrients and micronutrients stated in Section 2303 do not apply to guarantees for those water soluble nutrients, secondary nutrients, or micronutrients on products labeled only for hydroponic, continuous liquid feed programs, ready- to-use foliar products, and planting mixes or potting mediums labeled for container gardening.

Note: Authority cited: Sections 407, 14502 and 14631, Food and Agricultural Code. Reference: Section 14631, Food and Agricultural Code.

§ 2308. Soil Amendments.

(a) Soil amendments shall be measured by volume.

(b) No claim shall be made for chemical composition or nutritive [constituents], except as provided in (d), (e), and (f) of this section.

(c) When a soil amendment is labeled as a specific material, such as peat moss or leaf mold, the product shall consist of not less than 95 percent of that material.

(d) Organic products such as bark, wood chips, wood sawdust and peat or peat moss claimed to be nitrogen fortified, nitrogen stabilized, or with other terms to inform that the product contains nitrogen added to compensate for nitrogen likely to be taken from soil due to the amendments decomposition therein, are soil amendments when such

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additional nitrogen is 0.5 percent or less. Any claim for such nitrogen stabilization or fortification or similar term made on the label of a soil amendment shall be accompanied by a statement of the total percent of nitrogen contained therein.

(e) Soil amendments may contain wetting agents.

(1) The term "wetting agent" can be included in the list of ingredients in lieu of guaranteeing the specific wetting agent or the percentage of such, but the chemical name of the wetting agent must be submitted at the time of registration along with the analytical method.

(f) Iron (Fe), may be guaranteed at less than 0.1 percent.

(g) If reference is made to the acidity or alkalinity of the product, or its influence on the soil, the range or specific pH of the product must be guaranteed.

Note: Authority cited: Sections 407, 14502, 14601 and 14631, Food and Agricultural Code. Reference: Sections 14601 and 14631, Food and Agricultural Code.

§ 2309. Phosphorus Materials.

(a) Products that contain phosphorous acid shall state on the label the percentage of "Total phosphoric acid", upon conversion of phosphorous acid.

Total phosphoric acid (P2O5)_____%

In addition the label shall state the following:

(1) Phosphorous acid products are for use as a supplemental fertilizer treatment.

(2) Upon foliar application, the phosphite ions are taken up directly by the plant foliage and may undergo a degree of conversion to phosphate ions, or will be used directly by plants, as phosphite ions.

(3) As a soil application to annual crops, a lesser response from the initial crop, with a corresponding superior response from succeeding crops, may be observed. In addition, placement close to seeds or root zones may be injurious to crops. The effect may be aggravated by a soil pH below 6.5.

(b) Products that contain Phosphoric acid shall state on the label the percentage of "Available Phosphoric Acid". If, in addition, a percentage of "Total Phosphoric Acid" is stated, the percentage of "Insoluble Phosphoric Acid" (Citrate-Insoluble Phosphorus) must be stated immediately below, for example:

Available Phosphoric Acid (P_2O_5)_____%

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_____% Total Phosphoric Acid (P_2O_5)

_____% Insoluble Phosphoric Acid (P_2O_5)

Note: Authority cited: Sections 407, 14502 and 14631, Food and Agricultural Code. Reference: Section 14631, Food and Agricultural Code.

§ 2310. Seed and Plant Food Mixture.

A packaged combination of viable seeds for planting intermixed with nitrogen, available phosphoric acid, or potash, added singly or in combination totaling one percent or less, solely to stimulate the sprouting seeds after planting is not classed as any form of fertilizing material as defined in Section 14533 of the Food and Agricultural Code.

Note: Authority cited: Section 407 and 14502 of the Food and Agricultural Code. Reference: Section 14502 of the Food and Agricultural Code.

§ 2311. Slow Released Plant Nutrients.

(a) The label shall not state or imply that a plant nutrient or micronutrient contained in a fertilizer is released slowly over a period of time, unless such nutrients or micronutrients are identified and guaranteed.

(b) The types of slow released products recognized are:

(1) Water insoluble (N products only), such as natural organics, urea formaldehyde, isobutylidene diurea and oxamide.

(2) Coated slow release such as sulfur coated urea and other encapsulated soluble fertilizers.

(3) Products containing water soluble nitrogen such as ureaform materials, urea formaldehyde products, methylenediurea (MDU), dimethylene triurea (DMTU), dicyanodiamide (DCD).

(4) Occluded slow release, where fertilizers or fertilizer materials are mixed with waxes, resins, or other inert materials and formed into particles.

The terms “water insoluble,” “coated slow release,” “slowly available water soluble” and “occluded slow release” are accepted as descriptive of these products provided the claim is substantiated by a research study as required by section 2300(b).

(5) Products containing phosphorous acid such as potassium phosphite and ammonium phosphite which undergo a degree of conversion in plants or soils to available phosphoric acid (P2O5).

(6) Effective January 1, 2006, products containing elemental sulfur are a source of nutrient sulfur when applied to soil. Other application techniques for elemental sulfur must be substantiated by scientific research as required by Section 2300(b) that demonstrates availability of an efficacious amount of nutrient sulfur for plant uptake generally consistent with soil application.

(c) When slowly released nutrients are less than 15 percent of each total of the guarantee for either total nitrogen (N), available phosphoric acid (P_2O_5), or soluble potash (K_2O), as appropriate, the label shall not refer to slow release of the materials.

(d) Association of Official Analytical Chemist's (AOAC) latest method shall be used to confirm the coated slow release and occluded slow release nutrients and others whose slow release characteristics depend on particle size and AOAC latest method shall be used to determine the water insoluble nitrogen of organic materials.

Note: Authority cited: Sections 407, 14502 and 14631, Food and Agricultural Code. Reference: Section 14631, Food and Agricultural Code.

§ 2312. Gypsum Equivalent.

Any of the following four compounds, singly or in combination, shall be expressed as a percent gypsum equivalent on the label:

Hydrated Calcium Sulfate

Anhydride Calcium Sulfate

Hydrated Calcium Sulfite

Anhydride Calcium Sulfite

Note: Authority cited: Sections 407, 14502 and 14631, Food and Agricultural Code. Reference: Section 14631, Food and Agricultural Code.

ARTICLE 2. SAMPLES

§ 2313. Official Samples.

A sample of fertilizing materials drawn by the director for the purpose of analysis, in accordance with Sections 14641 and 14642 of the Food and Agricultural Code, shall be known as an "official sample" and shall be drawn in a manner prescribed by this article to represent the entire lot from which it is taken.

Note: Authority cited: Sections 407 and 14502, Food and Agricultural Code. Reference: Section 14605, Food and Agricultural Code.

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§ 2314. Subsamples.

Subsamples shall be provided to interested parties after laboratory analysis by the department, with the condition that the requesting party agree to provide analytical results of the subsample to the Department of Food and Agriculture, Feed, Fertilizer and Livestock Drug Branch within 21 days of receipt.

Note: Authority cited: Sections 407, 14502 and 14645, Food and Agricultural Code. Reference: Sections 14645 and 14646, Food and Agricultural Code.

§ 2315. Sampling Procedure.
Each official sample shall consist of a fertilizing material obtained in the following manner:

(a) Packaged Dry Materials.

(1) Use a sampler that removes a core diagonally from end-to-end of the container.

(2) The lot and the sample size consisting of not less than one pound will be established in the following manner:

(A) If a lot to be sampled consists of more than 10 bags, select 10 bags and withdraw one core from each. If a lot contains less than 10 bags, withdraw 10 cores, but at least one core from each bag present. When taking more than one core from the same bag, insert the trier into the same hole as previously probed.

(3) Small packages of dry fertilizer material in packages of 80 pounds or less, when not practical to sample according to subsection (2), shall be represented by one unbroken package which will constitute the official sample.

(4) Place all cores into sample container and send to the laboratory.

(b) Sampling Dry Fertilizing Materials in Bulk Lots. Dry bulk material samples shall consist of not less than one pound and be obtained by one of the following methods:

(1) Use a bulk cup-type sampler with an opening width at least three times the diameter of the largest particle being sampled and long enough to "cut" the complete stream. The delivery stream must be "cut" with the sampler at least ten times at equal intervals during the delivery.

The registrant mixing the material must supply a safe and convenient access to a stream of the material being loaded for the sampler.

(2) Use a "Missouri D" probe according to the following system:

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(i) At least 12 cores must be drawn in different locations.

(ii) When a single lot of fertilizing material is in two separate compartments, take a minimum of six cores from each compartment.

(iii) When a single lot of fertilizing material is in three or more compartments, take a minimum of four cores from each compartment.

(c) When sampling gypsum, the following procedure is acceptable:

(1) Scrape outer surface aside before inserting sampler.

(2) Take at least 20 approximately equal cores from fairly evenly distributed parts of the quantity.

(3) Portions may be taken with a trowel when the material contains large lumps or when for other reasons it is not possible to use a sampler.

(4) Place all portions into sample container and send to the laboratory for mixing and quartering.

(d) Liquid fertilizing materials must be sampled by one of the following systems:

(1) Full horizontal cylindrical or spherical tanks are sampled with a restricted fill liquid sampling device. Lower the liquid sampler just below the surface and allow to fill, the liquid sampler is then recovered and emptied into a suitable container. This process is repeated twice at the center level of the tank and once at the bottom. All four aliquots are thoroughly mixed and tested; or a sample of the four aliquots consisting of not less than one pint shall be sent to the laboratory for testing.

(2) Sample vertical cylindrical, cubic or rectangular shaped tanks by proceeding as in "(1)" except one aliquot is taken from the center level rather than taking two aliquots from the center level.

(3) Nonpressurized nitrogen solutions, nitrogen-phosphate mixtures, and other clear solutions may be sampled at the sight gauge or outlet after these openings have been drained and flushed with the solution. Fertilizer suspensions or slurries must be completely agitated before sampling; when a homogenous mixture is achieved, sample as above.

(4) Streamcutting a homogenous mixture from a valve while loading is an acceptable sampling procedure.

(5) Small packages of liquid fertilizing materials, when not practical to sample according to subsection (d)(1)(2)(3), shall be represented by one unbroken package which will constitute the official sample.

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Note: Authority cited: Sections 407, 14502 and 14591, Food and Agricultural Code.
Reference: Section 14591, Food and Agricultural Code.

§ 2316. Identification of Official Sample.

A sample of a fertilizing material shall be identified before removal from premises where it was drawn. The identification shall consist of the date; name of product as given on the label, if any; inspector's initials and sample number.

Note: Authority cited: Sections 407, 14502 and 14645, Food and Agricultural Code.
Reference: Sections 14645 and 14646, Food and Agricultural Code.

§ 2317. Description of Sample.

An inspector's Product Sample Data official form showing pertinent information concerning the sample shall be prepared at the time each official sample is drawn. Where reasonably possible, a label shall be taken from the lot represented by the sample and accompany the inspector's Product Sample Data.

Note: Authority cited: Sections 407, 14502 and 14645, Food and Agricultural Code.
Reference: Sections 14605, 14645 and 14646, Food and Agricultural Code.

§ 2317.5. Investigational Allowances.

(a) A fertilizing material shall be deemed deficient if the analysis of any nutrient is below the guarantee by an amount exceeding the values in the following schedule:

Primary Nutrients

Guarantee Percent	Total Nitrogen (N) Percent	Available Phosphoric Acid (P_2O_5) Percent	Soluble Potash (K_2O) Percent
4 or less	0.49	0.67	0.41
5	0.51	0.67	0.43
6	0.52	0.67	0.47
7	0.54	0.68	0.53
8	0.55	0.68	0.60
9	0.57	0.68	0.65
10	0.58	0.68	0.70
12	0.61	0.69	0.79
14	0.63	0.70	0.87
16	0.67	0.70	0.94
18	0.70	0.71	1.01
20	0.73	0.72	1.08
22	0.75	0.72	1.15
24	0.78	0.73	1.21

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Guarantee Percent	Total Nitrogen (N) Percent	Available Phosphoric Acid (P_2O_5) Percent	Soluble Potash (K_2O) Percent
26	0.81	0.73	1.27
28	0.83	0.74	1.33
30	0.86	0.75	1.39
32	0.88	0.76	1.44
34	0.88	0.79	1.46
36	0.88	0.83	1.49
38	0.88	0.86	1.51
40	0.88	0.90	1.54
42	0.88	0.93	1.56
44	0.88	0.96	1.58
46	0.88	1.00	1.61
48	0.88	1.03	1.63
50	0.88	1.07	1.66
52	0.88	1.10	1.68
54	0.88	1.10	1.70
56	0.88	1.10	1.73
58	0.88	1.10	1.75
60	0.88	1.10	1.78
62	0.88	1.10	1.80

(1) If the guaranteed percent is between listed values, the higher investigational allowance shall be applied. For example, a 21% N guarantee would have a 0.75% investigational allowance.
(2) In no case may the investigational allowance exceed 50 percent of the amount guaranteed.
(3) For Triple Super Phosphate (TSP), the investigational allowance for available phosphoric acid (P_2O_5) shall be 1.53%.

(b) Secondary and micronutrients shall be deemed deficient if the analysis of any element is below the guarantee by an amount exceeding the values calculated according to the following schedule:

Secondary and Micronutrients

Element	Investigational Allowance
Calcium	0.2 unit + 5% of guaranteed analysis
Magnesium	0.2 unit + 5% of guaranteed analysis
Sulfur	0.2 unit + 5% of guaranteed analysis
Boron	0.003 unit + 15% of guaranteed analysis
Cobalt	0.0001 unit + 30% of guaranteed analysis
Molybdenum	0.0001 unit + 30% of guaranteed analysis
Chlorine	0.005 unit + 10% of guaranteed analysis
Copper	0.005 unit + 10% of guaranteed analysis
Iron	0.005 unit + 10% of guaranteed analysis

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Element	Investigational Allowance
Manganese	0.005 unit + 10% of guaranteed analysis
Sodium	0.005 unit + 10% of guaranteed analysis
Zinc	0.005 unit + 10% of guaranteed analysis
The maximum allowance when calculated in accordance to the above shall be 1 unit (one percentage point).	

(1) For low guarantees not represented by this table, an investigational allowance of 50 percent of the amount guaranteed will be applied.
(2) The investigational allowances are applied as follows:

(A) For zinc guaranteed at 0.75 percent Zn, the investigational allowance is calculated as 0.005 + 0.1(0.75) = 0.08 percent. An analyzed value for zinc of 0.66 percent (0.75 – 0.08 = 0.67) or less would be declared deficient and in violation. An analyzed value for zinc of 0.67 percent or more is within the investigational allowance for a zinc guarantee of 0.75 percent Zn.

(B) For zinc guaranteed at 36.0 percent Zn, the investigational allowance is calculated as 0.005 + 0.1(36.0) = 3.605 percent. However, the maximum allowance is 1 unit (one percentage point). Therefore, the investigational allowance for a 36.0 percent Zn guarantee is 1.0 percentage point. An analyzed value of 34.99 percent Zn or less would be declared deficient and in violation. An analyzed value for zinc of 35.0 percent or more is within the investigational allowance for a 36.0 percent zinc guarantee.

(c) Other guarantees or claims shall be deemed deficient if any ingredient or claim is below the guaranteed by an amount exceeding the values in the following schedule:

Other Ingredient Guarantees or Claims

Ingredient or Claim	Investigational Allowance
Humic Acid	10% of guaranteed analysis
Gypsum	5% of guaranteed analysis
Gypsum Equivalent	5% of guaranteed analysis
Calcium Carbonate Equivalent	5% of guaranteed analysis
Vitamin B-1 (*thiamine hydrochloride*)	30% of guaranteed analysis
pH	pH 3.14% of required National Organic Program value (3.5 pH) (*only required for organic input material liquid fish products*)

(1) The investigational allowance for pH is applied as follows:

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(A) For organic input material liquid fish products, the National Organic Program states that the pH cannot be lowered below 3.5. 3.5 pH – 3.5(3.14%) = 3.3901 pH. Any value below 3.3901 pH would be in violation of the National Organic Program rule (7 CFR 205.601(j)(7)). Any value between 3.3901 to 3.4999 is within investigational allowance.

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Note: Authority cited: Sections 407, 14502 and 14645, 14647 Food and Agricultural Code.
Reference: Sections 14645 and 14646, Food and Agricultural Code.

ARTICLE 3. LICENSING

§ 2318. Licensing.

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In addition to the requirements found in Section 14591 of the Food and Agricultural Code, each licensee is required to provide a place of business. If the secretary returns an incomplete application for a license to the applicant:

(a) A completed application resubmitted within 180 days from the date the secretary initially returned the application shall not require payment of a new licensing fee.

(b) A new licensing fee must accompany a completed application resubmitted more than 180 days from the date the secretary initially returned the application.

Note: Authority cited: Sections 407, 14502 and 14591, Food and Agricultural Code.
Reference: Section 14591, Food and Agricultural Code.

§ 2319. Experimental Use of a Fertilizing Material.

Experimental use of a fertilizing material for noncommercial value is exempt from registration when all of the following conditions have been satisfied:

(a) The material shall not be sold.

(b) The material shall be conspicuously identified on the display panel as "EXPERIMENTAL USE ONLY".

(c) The user(s) or recipient(s) of the material shall be documented by the manufacturer.

(1) Documentation shall be retained and available to the secretary upon request for at least three years from date the material was provided.

Note: Authority cited: Sections 407, 14502 and 14591, Food and Agricultural Code.

Reference: Sections 14531 and 14591, Food and Agricultural Code.

ARTICLE 4. REGISTRATION

§ 2320. Registration.

In addition to requirements found in Section 14601 of the Food and Agricultural Code, the following information is required.

Each auxiliary soil and plant substance, packaged agricultural mineral, packaged soil amendment, specialty fertilizer, and organic input material shall be registered in the name of the legal entity or person whose name appears on the label before being distributed in this state.

These materials shall not be distributed or sold unless the product is registered.

Note: Authority cited: Sections 407, 14502 and 14601, Food and Agricultural Code. Reference: Section 14601, Food and Agricultural Code.

§ 2320.1. Fertilizing Material Product Labels Submitted for Registration.

(a) The fee for each organic input material product label submitted for registration is five hundred dollars ($500). The fee for renewing each organic input material product label is also five hundred dollars ($500).

(b) Each product label registration shall be valid for a two-year period based on the beginning of the designated group registration cycle. Registrations are divided into four groups, based on the first letter or number of the firm name. Group 1's registration shall be renewed on January 1 of even numbered years; group 2's registration shall be renewed on July 1 of even numbered years; group 3's registration shall be renewed on January 1 of odd numbered years; and group 4's registration shall be renewed on July 1 of odd numbered years. The chart below displays what group a firm is in, based on the first letter or number of the firm name. This revised registration cycle is effective January 1, 2018. During the registration renewal cycle transition, firm's registration fees may be prorated.

Group	Firm Name	Cycle
1	R – Z	January 1 – even numbered years
2	A – C and firms starting with numerals	July 1 – even numbered years
3	D – I	January 1 – odd numbered years

4	J – Q	July 1 – odd numbered years

(c) If the Secretary returns an incomplete application for product registration to the applicant, the applicant has 180 days from the date the Secretary initially returned the application to resubmit a complete application without payment of a new registration fee. A new registration fee must accompany applications resubmitted after 180 days from the date the Secretary returned the application.

Note: Authority cited: Sections 407, 14502, 14601, and 14604, Food and Agricultural Code. Reference: Section 14601, Food and Agricultural Code.

§ 2320.2. Registration Application for Organic Input Material Product Label.

(a) Organic input materials submitted for registration shall comply with the requirements of the National Organic Program (NOP) standards, as specified in Part 205 (commencing with Section 205.1) of Subchapter M of Chapter I of Subtitle B of Title 7 of the Code of Federal Regulations.

(b) Product label registration for Organic Input Material shall be made on an application designated by the department, Organic Input Material, Fertilizing Materials Registration Application, 513-026 (Rev. 07/13), which is hereby incorporated by reference. Applications must be accompanied by the appropriate fee and shall include:

(1) A copy of the label accompanying the material and a statement of all claims to be made for it, including the directions and precautions for use.

(2) The complete formula of the material including the active, inert ingredients, the name, source, and function of every substance that is added in creation of the final product. This includes primary ingredients and feedstocks, growth media, substrates, extractants, solvents, emulsifiers, precursors, reactants and stabilizers, as well as any chelating, complexing, crystallizing, granulating, hydrolyzing, flowing, or floating agents, or any other additives.

(3) A complete description of the manufacturing process for the Organic Input Materials (OIM), including ingredient amounts, sequence and duration of events, temperature changes, reactions, and all steps taken to assure that OIM are not contaminated with USDA-NOP prohibited substances as well as a description of any composting, digestion, fermentation, extraction, or other processes and any methods used for removing extractants or growth media from the final product.

(4) The intended uses of the product.

(5) The source or supplier of all ingredients.

(6) Alternate formulation.

(7) Third party formulated ingredients.

(8) An organic input material inspection report for manufacturers that produce liquid OIMs with a nitrogen guarantee labeled greater than 3%.

(9) Any additional information deemed necessary by the secretary.

Note: Authority cited: Sections 407, 14502 and 14601, Food and Agricultural Code.
Reference: Sections 14550.5, 14601 and 14631 Food and Agricultural Code.

§ 2320.3. Scope of Organic Input Material.

(a) A fertilizing material shall be considered to be an organic input material requiring label registration under the following circumstances:

(1) The fertilizing material making claims of compliance to the United States Department of Agriculture, National Organic Program (NOP) standards, or claims for use in organic crop and food production, including but not limited to, submission by the supplier, distributor, or manufacturer for listing by a third-party organic input material review organizations recognized by the NOP.

(2) The fertilizing material includes claims on labels, labeling, literature or extensions of labels, such as websites or social media outlets, or other electronic or verbal communications that the products are suitable for use in the organic crop and food production system.

(b) "Natural Organic Fertilizer" as defined in section 14548 of the Food and Agricultural Code, shall not require registration, under the following circumstances:

(1) The product does not have a label as a fertilizing material, does not make claims of compliance with United States Department of Agriculture, NOP standards, regulations, or statutes, or does not claim that it is acceptable or approved for use in organic crop and food production.

(2) The product does not make nutrient claims on literature, bills of lading, laboratory analysis or extensions of labels, such as websites, social media outlets, or verbal communication.

Note: Authority cited: Sections 407, 14502, 14548, 14550.5 and 14601, Food and Agricultural Code.
Reference: Sections 14601, 14550.5, 14548 and 14631, Food and Agricultural Code.

§ 2320.4 Use of the Term "Organic" on Labels and/or Labeling.

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(a) Fertilizing material labels and/or labeling displaying the term "organic" in the licensee's name on the label, logos, slogans, or brand names, shall be registered as an organic input material or shall comply with subsection (c) by December 31, 2015.

(b) Label and labeling claims implying that a product is suitable for organic crop and food production shall be registered as an organic input material or shall comply with subsection (c). Organic claims include, but are not limited to, the following: Organic gardening, certified organic, and compliance with National Organic Program (NOP) standards.

(c) The use of the term "organic" on fertilizing material labels and/or labeling, as described in (a) and (b) of this section, not meeting the NOP standards shall include one of the following declarations: "Not for use in organic crop and organic food production in the State of California" or "Not for use in organic crop and organic food production."

(1) The declaration shall appear in the display panel of the label.

(2) The declaration shall be in such a style of type of lettering as to be clearly and conspicuously presented with respect to other type, lettering, or graphic material on the label.

Note: Authority cited: Sections 407, 14502, 14550.5 and 14601, Food and Agricultural Code. Reference: Sections 14601, 14550.5 and 14631, Food and Agricultural Code.

§ 2320.5. Registered Product List.

(a) The secretary shall maintain a list of registered fertilizing materials on the department's website.

Note: Authority cited: Sections 407, 14502, and 14601, Food and Agricultural Code. Reference: Section 14601, Food and Agricultural Code.

ARTICLE 5. TONNAGE REPORTING

§ 2321. Tonnage Reporting

In addition to the requirements found in Sections 14621, 14622 and 14623 of the Food and Agricultural Code, the following is required.

(a) The tonnage report shall be made semi-annually no later than July 31, and no later than January 31 of each year. Zero reports are required.

Note: Authority cited: Sections 407, 14502, 14621, 14622 and 14623, Food and Agricultural Code.

Reference: Sections 14621 and 14622, Food and Agricultural Code.

ARTICLE 6. ADMINISTRATIVE PENALTIES

§ 2322. Administrative Penalty Guidelines.

In applying Section 14651.5 of the California Food and Agricultural Code, the secretary shall use the provisions of this section to determine the violation class and amount of the penalty.

(a) For the purposes of this section, violation classes are designated as serious, moderate, and minor to establish maximum penalty amounts. Repeat violations may result in an escalation of violation class and/or penalty. Escalation of penalties may apply for a revolving five-year period from the date of each unique section code violation. Serious and moderate violations may be downgraded based upon the evidence, the factual circumstances, mitigating factors, and the cooperation of the violator.

(1) "Serious." Violations that cause significant false, misleading or deceptive business practices that involve the misbranding, adulteration of fertilizing material products, movement of quarantined products without prior approval of the secretary, refusal to submit records upon request; or repeated violations of sub-paragraph (2). Serious violations are punishable by an administrative penalty of up to five thousand dollars ($5,000).

(2) "Moderate." Violations in which there is a potential for intermediate level of consumer or competitive harm or repeated violations of sub-paragraph (3). Moderate violations are punishable by an administrative penalty of up to one thousand dollars ($1,000).

(3) “Minor.” Violations that are unintentional and have minimal adverse effects on consumers or equitable competition in the marketplace. In lieu of an administrative penalty, the secretary may issue a notice of warning for minor violations.

(b) Table A: Violations Matrix provides the level of severity of a particular violation and the corresponding penalty range for serious, moderate, and minor violation classes. Except where specific violation parameters are provided, the violation column in Table A: Violations Matrix is an abbreviated description of the corresponding section in Division 7, Chapter 5, Article 10 of the California Food and Agricultural Code and Title 3, Division 4, Chapter 1 of the California Code of Regulations.

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Table A: Violations Matrix

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
FAC § 14591 Unlicensed Manufacturer	Manufacturer is not licensed to sell fertilizing materials in California from this business location.	X			Notice of warning / notice of violation for the first violation with 30 days to comply, after which penalties for the second and subsequent violations would apply. $500 for the second violation. $1,000 for each subsequent violation. Sources: FAC §§ 14518, 14529, 14533, 14544, 14555, 14651.5 3 CCR §§ 2322(a)(2), 2322(a)(1)
FAC § 14601 Unregistered Product	Product is not registered for sale in California.	X			Notice of warning / notice of violation for the first violation, with 30 days to comply, after which penalties for the second and subsequent violations would apply. $500 for the second violation. $1,000 for each subsequent violation. Sources: FAC §§ 14529, 14651.5 3 CCR §§ 2320, 2322(a)(2), 2322(a)(1)

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Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
FAC § 14611 Mill Assessments	Any licensee whose name appears on the label who sells or distributes fertilizing materials to unlicensed purchasers shall pay to the secretary an assessment not to exceed two mills ($0.002) per dollar of sales for all fertilizing materials.	X			For non-submittal of each quarterly mill assessment, the first violation shall receive a notice of warning / notice of violation with 30 days to comply, after which penalties for the second and subsequent violations would apply. $1,000 for each subsequent violation. Any delinquent payment is subject to a penalty of 15 percent of the delinquent payment. Sources: FAC §§ 14533, 14543, 14613 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1), 2326.2
FAC § 14623 Tonnage	The tonnage report shall be submitted to the secretary semiannually not later than January 31 and July 31 of each year. The secretary shall impose a penalty in the amount of two hundred dollars ($200) on any person who does not submit the report on or before those dates.		X		$200 for non-submittal for each semi-annual report. Sources: FAC § 14623 3 CCR §§ 2321, 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
FAC § 14631 Unlabeled Product (Label shall accompany each shipment)	Every lot, parcel or package of fertilizing material distributed into or within California shall be accompanied by a label.	X			Notice of warning / notice of violation for the first violation with 30 days to comply, after which penalties for the second and subsequent violations would apply. $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
FAC § 14641 Access to records and premises	The secretary shall have free access at reasonable times to all records, premises, production processes, or conveyances that are used in the manufacture, transportation, importation, distribution, storage, or application of any fertilizing material.			X	Violations are punishable at $5,000. Sources: FAC §§ 14533, 14651.5 3 CCR § 2322(a)(1)
FAC § 14642 Sampling and access to facility	The secretary shall, at the times and to the extent necessary for the enforcement of this chapter, do all of the following: (a) Take samples of any substance. (b) Make analyses or examinations of any substance. (c) Conduct investigations concerning the use, sale, adulteration, or misbranding of any substance. Inspect the fertilizing material manufacturing facilities and take samples at various stages of production to verify label and labeling claims and production processes.			X	Violations are punishable at $5,000. Sources: FAC §§ 14533, 14641, 14651.5 3 CCR §§ 2313, 2315, 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
FAC § 14655 Movement of Quarantine	(a) Any lot of fertilizing material for which a hold order or notice is issued shall be held by the person having control of the material and shall not be distributed or moved except under the specific directions of the secretary, pending final disposition pursuant to this chapter. This does not prevent the person who has control of the material from inspecting any seized material or from taking a reasonable sample for evidence while in the presence of a person designated by the secretary.			X	$1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14529, 14533, 14651.5 3 CCR § 2322(a)(1)
FAC § 14681(a) Misbranded Product (Misleading Label)	No person shall distribute misbranded fertilizing materials. A fertilizing material shall be deemed misbranded if its label is false or misleading in any particular way.			X	$1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14529, 14533, 14540, 14542, 14554, 14651.5 3 CCR § 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
FAC § 14681(b) Misbranded Product (False Distribution)	No person shall distribute misbranded fertilizing materials. A fertilizing material shall be deemed misbranded if it is distributed under the name of another fertilizing material.			X	$1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14529, 14533, 14540, 14542, 14554, 14651.5 3 CCR § 2322(a)(1)
FAC § 14681(c) Misbranded Product (Not Labeled as Required)	No person shall distribute misbranded fertilizing materials. A fertilizing material shall be deemed to be misbranded if it is not labeled as required by regulations.			X	$1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14529, 14533, 14540, 14542, 14554, 14651.5 3 CCR § 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
FAC § 14682(a) Adulterated Product (Harmful to Plants)	No person shall knowingly distribute an adulterated fertilizing material. A fertilizing material shall be deemed adulterated if it contains any deleterious or harmful ingredient in sufficient amounts to render it injurious to beneficial plant life when applied in accordance with direction for use on the label, or if adequate warning statements or directions for use that may be necessary to protect plant life are not indicated on the label.			X	$1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14529, 14533, 14540, 14542, 14554, 14651.5 3 CCR § 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
FAC § 14682(b) Adulterated Product (Composition)	No person shall distribute an adulterated fertilizing material. A fertilizing material shall be deemed adulterated if its composition falls below or differs from that which it is purported to possess by its labeling.			X	$1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14529, 14533, 14540, 14542, 14554, 14651.5 3 CCR § 2322(a)(1)
FAC § 14682(c) Adulterated Product (Unwanted crop or weed seed)	No person shall distribute an adulterated fertilizing material. A fertilizing material shall be deemed adulterated if it contains unwanted crop seed or weed seed.			X	$1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14529, 14533, 14554, 14651.5 3 CCR § 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
FAC § 14682(d) Adulterated Product (Threat to Public Safety)	No person shall distribute an adulterated fertilizing material. A fertilizing material shall be deemed to be adulterated if it is a threat to public safety.			X	$1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14529, 14533, 14554, 14651.5 3 CCR § 2322(a)(1)
FAC § 14682(e) Adulterated Product (Organic Input Material)	No person shall distribute an adulterated fertilizing material. A fertilizing material shall be deemed to be adulterated if an organic input material contains ingredients that, in any type or amount, do not comply with the requirements of the National Organic Program standards.			X	$1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14529, 14533, 14540, 14542, 14550.5, 14554, 14651.5 3 CCR § 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2300(e) Zero Guarantees	"Zero" guarantees shall not appear in the guaranteed analysis statement.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14536, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)
3 CCR § 2300(f) Brand Names	Brand names, trade names, and trademarks are prohibited in the derivation statement or list of ingredients.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14527, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

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Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2300(g) No State of California Endorsement	The statement "State of California approved" or other indication of official approval is prohibited in labeling and advertising unless allowed for organic input material.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2300(h) Boron (B) Warning Statement	A warning or caution statement shall appear on the label of any commercial fertilizer or agricultural mineral product which contains 0.1 percent or more by weight of Boron in water soluble form. This statement shall carry the word "WARNING," "CAUTION," "ATTENTION," or "NOTICE," conspicuously displayed, and shall state the crop(s) for which the fertilizing material is to be used or state that the use of the fertilizing material on any crops other than those recommended may result in serious injury to the crop(s).	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2300(i) Molybdenum (Mo) Warning Statement	Except for products labeled only for indoor or hydroponic use, a warning or caution statement shall appear on the label of any commercial fertilizer or agricultural mineral product which contains 0.001 percent or more by weight of molybdenum (Mo). This statement shall carry the word "WARNING," "CAUTION," "ATTENTION," or "NOTICE," conspicuously displayed, and the statement that the application of fertilizing materials containing molybdenum (Mo) may result in forage crops containing levels of molybdenum (Mo) which are toxic to ruminant animals.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2300(j) Ingredient Outside Guaranteed Analysis	When the name of a fertilizing material ingredient appears on the label, that ingredient shall be represented in the guaranteed analysis statement and derivation statement, or statement of composition or list of ingredients.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14527, 14533, 14536, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)
3 CCR § 2300(k)(2) Product Composition Change Notification	For registered fertilizing materials, the manufacturer shall notify the secretary of any changes in the information on file regarding the product's composition within 30 days of the change.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply, after which penalties for the second and subsequent violations would apply. $500 for the second violation. $1,000 for each subsequent violation. Sources: FAC §§ 14533, 14544, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2300(l) Disclosure of Product Composition	The manufacturer shall submit the required information regarding the composition of fertilizing materials.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply, after which penalties for the second and subsequent violations would apply. $500 for the second violation. $1,000 for each subsequent violation. Sources: FAC §§ 14533, 14544, 14651.5, 14681 3 CCR §§ 2300(b), 2300(k), 2322(a)(3), 2322(a)(2), 2322(a)(1)
3 CCR § 2301 Use of Numerals to Describe Guaranteed Analysis	When any series of numerals are used in labeling of or in advertising to describe the formula or analysis, or in connection with the name, brand, or trademark, such numerals shall be arranged so that the first will be the guaranteed percentage of nitrogen; the second, the guaranteed percentage of available phosphoric acid; and the third, the guaranteed percentage of soluble potash. The guaranteed percentages shall be consistent with the guaranteed analysis.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14536, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2302(a) Heavy Metal (As, Cd, Pb) Violation	Inorganic commercial fertilizer and agricultural minerals with iron, manganese, phosphates, or zinc shall not exceed the concentrations of non-nutrient metals.		X		$1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14522, 14651.5, 14682 3 CCR § 2322(a)(1)
3 CCR § 2302(a)(4)(5) Heavy Metals Violation (Specialty Fertilizer)	Specialty fertilizers with iron, manganese, phosphates, or zinc shall not exceed the concentrations of non-nutrient metals.		X		$1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14563, 14651.5, 14682 3 CCR § 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(a) Product Name	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include the product name.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)
3 CCR § 2303(b)(1) Net Weight (Dry)	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include the net weight of dry materials (not required for soil amendments). US and metric units are required on dry materials, except those distributed with a weight certificate.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(b)(2) Volume	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include the volume of organic input material bulk soil amendments, packaged soil amendments, and liquid materials. US and metric units are required on organic input material bulk soil amendments, packaged soil amendments, and liquid materials, except those distributed with a weight certificate.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(b)(3) Density and Temperature (Liquid Bulk)	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include the density (pounds per gallon at 68 degrees Fahrenheit), for bulk liquids only.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(c) Grade (Commercial Fertilizer Labels)	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include the grade (for commercial fertilizer labels only).	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14535 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(d) Licensees Name and Address on Label	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include the licensee's name and address.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14543, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(e) Purpose Statement	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include the purpose of the product (for auxiliary soil & plant substances, packaged agricultural minerals, packaged soil amendments, and specialty fertilizers).	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(f) Directions for Use	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include the directions for use (for auxiliary soil and plant substances, packaged agricultural minerals, packaged soil amendments and specialty fertilizers).	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(g) Non Plant Food Ingredient Statement	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include the statement "NONPLANT FOOD INGREDIENT" printed in capital letters (for auxiliary soil and plant substance products).	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(h) Statement of Composition	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include a statement of composition showing the percent of each active ingredient, which is the agent in the product primarily responsible for the intended effects (for auxiliary soil and plant substances). The statement shall follow the required format.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2300.1(b), 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(i) Guaranteed Analysis on Label	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include a guaranteed analysis using the correct format, terminology and order.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14536, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(i)(2) Secondary and Micronutrients	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include a guaranteed analysis of secondary and micronutrients (if claimed) using the correct format at or above the established minimum values.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14546, 14559, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(i)(3) Liming Material Guarantees	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include a guaranteed analysis of liming material guarantees (if claimed) using the correct format at or above the established minimum values.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(i)(4) Gypsum Guarantees	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include a guaranteed analysis of gypsum guarantees (if claimed) using the correct format.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14537, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(i)(5) Gypsum Equivalent Guarantees	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include a guaranteed analysis of gypsum equivalent guarantees (if claimed) using the correct format.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14537, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(j) Derivation Statement	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include a derivation statement directly following the last nutrient guarantee (for commercial fertilizers and agricultural mineral labels).	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14527, 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(j)(1) Abbreviations	Abbreviations shall not appear in the derivation statement, with the exception of chelating agents.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14520, 14527, 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(j)(2) Liming Materials	For liming materials, the derivation statement shall follow the last guarantee.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14527, 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(k) List of Ingredients	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include a list of ingredients in decreasing amounts present (for packaged soil amendments and organic input material bulk soil amendments).	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(l) Non plant Food Ingredient Statement	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include that the format and guarantees shall appear after the derivation statement of agricultural mineral and commercial fertilizer labels: "ALSO CONTAINS NONPLANT FOOD INGREDIENT(S):".	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(m) Additional Information within Guaranteed Analysis	Additional information, other than secondary or micronutrient guarantees, shall not appear in the guaranteed analysis statement.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14536, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(n) Forms of nitrogen (N) adding to Total N	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include that the guarantees for the forms of nitrogen must add up to the total nitrogen guarantee claimed and are recommended in the order appearing in the format shown in section 2303(i)(1).	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)
3 CCR § 2303(o) Zeros Before Decimal Point	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include that zeros are required before the decimal points when less than one percent.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(p) Labels for Packaged Products	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include that, for packaged products, the information found in section 2303(a) through (o) shall either: (1) Appear on the label, or (2) Be printed on a tag and attached to the package. This information shall be in a conspicuous form.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14551, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(q) Labels for Bulk Products	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include that, for bulk products, the information found in section 2303(a) through (o) shall be in written or printed form and shall accompany the delivery. This information shall be in a conspicuous form.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14517, 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(r) Heavy Metal Statement (Base Ingredients)	The label information for fertilizing materials required by Section 14631 of the Food and Agricultural Code shall include that the manufacturer of any base fertilizing material ingredient that claims iron, manganese, zinc or phosphates shall provide a guarantee statement that the product does not exceed standards established for arsenic, cadmium and lead, located in 3 CCR Section 2302.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)
3 CCR § 2303(s)(1) Heavy Metal Informational Statement on the Label, or a Website or Phone Number for the data	In lieu of stating the metals on the label, provide either a licensee maintained website that contains no advertising or company specific information, direct link to a government website or provide a toll free number.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2303(u) Inaccurate Heavy Metals Information	The publication of inaccurate information regarding the contents and levels of metals is a misbranding violation pursuant to Section 14681 of the Food and Agricultural Code.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681(a) 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2304 Biotics	The label of each product which contains organisms, enzymes and other biologically active by products of organisms for which claims are made shall state: (a) Name of each species and strains as part of the statement of composition and name of each by-product, if claimed. (b)(1) The percentage or number of viable units of microorganisms per cubic centimeter or per gram for dry material. (2) The concentration in percentage of enzymes or other organism by-products claimed. (c) The expiration date for use. (d) Storage conditions.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14514, 14533, 14540, 14542, 14651.5 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2305(a) Chelating Agents (Name)	Label chelation claims shall state the name of the chelating agent.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14520, 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2305(b) Chelating Agents (Analysis)	The percent of guaranteed chelated micronutrient content shall be stated within the guaranteed analysis.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14520, 14533, 14536, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2306 Fish Emulsion	When a product is labeled as fish emulsion, it shall contain a minimum of 40 percent total solids.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14520, 14533, 14534, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2308(a) Packaged Soil Amendments (Volume)	Packaged soil amendments shall be measured by volume (quarts/cubic feet). If other measurement information is shown, it shall be in parentheses following the volume statement.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14552, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2308(b) Packaged Soil Amendments (Composition Claims)	No claim shall be made for chemical composition or nutritive constituents, except as provided in (d) and (f) of this section.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14552, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2308(c) Packaged Soil Amendments (Composition)	When a packaged soil amendment is labeled as a specific material, such as peat moss or leaf mold, the product shall consist of not less than 95 percent of that material.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14552, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2308(d) Packaged Soil Amendments (Nitrogen Fortification)	Organic products such as bark, wood chips, wood sawdust and peat or peat moss claimed to be nitrogen fortified, nitrogen stabilized, or with other terms to inform that the product contains nitrogen added to compensate for nitrogen likely to be taken from soil due to the amendments decomposition therein, are soil amendments when such additional nitrogen is 0.5 percent or less. Any claim for such nitrogen stabilization or fortification or similar term made on the label of a packaged soil amendment shall be accompanied by a statement of the total percent of nitrogen contained therein.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14552, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2308(e)(1) Packaged Soil Amendments (Wetting Agents)	The claim "wetting agent added" can be made without guaranteeing the specific wetting agent or the percentage of such, but the chemical name of the wetting agent must be submitted at the time of registration along with the analytical method.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14552, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2308(g) Packaged Soil Amendments (pH guarantee)	If reference is made to the acidity or alkalinity of the product, or its influence on the soil, the range or specific pH of the product must be guaranteed.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14552, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2309 Phosphorous materials	(a) Products that contain phosphorous acid shall state on the label the percentage of "Total Phosphoric Acid", upon conversion of phosphorous acid. In addition, the label shall state the following: (1) Phosphorous acid products are for use as a supplemental fertilizer treatment. (2) Upon foliar application, the phosphite ions are taken up directly by the plant foliage and may undergo a degree of conversion to phosphate ions, or will be used directly by plants, as phosphite ions. (3) As a soil application to annual crops, a lesser response from the initial crop, with a corresponding superior response from succeeding crops, may be observed. In addition, placement close to seeds or root zones may be injurious to crops. The effect may be aggravated by a soil pH below 6.5. (b) Products that contain Phosphoric acid shall state on the label the percentage of "Available Phosphoric Acid". If, in addition, a percentage of "Total Phosphoric Acid" is stated, the percentage of "Insoluble Phosphoric Acid" (Citrate-Insoluble Phosphorus) must be stated immediately below.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2311(a) Slow Release (Claims)	The label shall not state or imply that a plant nutrient or micronutrient contained in a fertilizer is released slowly over a period of time, unless such nutrients or micronutrients are identified and guaranteed.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2311(b) Slow Release (Accepted Products)	The types of slow released products recognized are: (1) Water insoluble (N products only), such as natural organics, urea formaldehyde, isobutylidene diurea and oxamide. (2) Coated slow release such as sulfur coated urea and other encapsulated soluble fertilizers. (3) Products containing water soluble nitrogen such as ureaform materials, urea formaldehyde products, methylenediurea (MDU), dimethylene triurea (DMTU), dicyanodiamide (DCD). (4) Occluded slow release, where fertilizers or fertilizer materials are mixed with waxes, resins, or other inert materials and formed into particles. The terms "water insoluble", "coated slow release", "slowly available water soluble" and "occluded slow release" are accepted as descriptive of these products provided the claim is substantiated by a research study as required by section 2300(b). (5) Products containing phosphorous acid such as potassium phosphite and ammonium phosphite which undergo a degree of conversion in plants or soils to available phosphoric acid (P_2O_5).	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2311(c) Slow Release (Minimum Percentage)	When slowly released nutrients are less than 15 percent of each total of the guarantee for either total nitrogen (N), available phosphoric acid (P_2O_5), or soluble potash (K_2O), as appropriate, the label shall not refer to slow release of the materials.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)
3 CCR § 2312 Gypsum equivalent	Any of the following four compounds, Hydrated Calcium Sulfate, Anhydride Calcium Sulfate, Hydrated Calcium Sulfite, and Anhydride Calcium Sulfite singly or in combination, shall be expressed as a percent gypsum equivalent on the label.	X			First violation shall receive a notice of warning / notice of violation with 30 days to comply. For each subsequent violation, the violations matrix for FAC § 14681(a) and/or (c) applies as follows: $1,000 for the second violation. $2,500 for the third violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14651.5, 14681 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2314 Subsamples	Subsamples shall be provided to interested parties after laboratory analysis by the department, with the condition that the requesting parties agree to provide analytical results of the subsample to the Department of Food and Agriculture, Feed, Fertilizer and Livestock Drug Branch within 21 days of receipt.		X		For non-submittal of analytical results, the first violation shall receive a notice of warning / notice of violation with 30 days to comply, after which penalties for the second and subsequent violations would apply. $500 for second violation. $1,000 for each subsequent violation. Sources: FAC § 14651.5 3 CCR §§ 2322(a)(2), 2322(a)(1)
3 CCR § 2319 Experimental Use of a Fertilizing Material	Experimental use of a fertilizing material for noncommercial value is exempt from registration when all of the following conditions have been satisfied: (a) The material shall not be sold. (b) The material shall be conspicuously identified on the display panel as "EXPERIMENTAL USE ONLY". (c) The user(s) or recipient(s) of the material shall be documented by the manufacturer. (1) Documentation shall be retained and available to the secretary upon request for at least three years from date the material was provided.			X	$1000 for the first violation. $2500 for the second violation. $5000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14531, 14533, 14540, 14542, 14651.5 3 CCR § 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2320 Registration	In addition to requirements found in Section 14601 of the Food and Agricultural Code, the following information is required. Each auxiliary soil and plant substance, packaged agricultural mineral, packaged soil amendment, specialty fertilizer, and organic input material shall be registered in the name of the legal entity or person whose name appears on the label before being distributed in this state. These materials shall not be distributed or sold unless the product is registered.	X			The penalties shown in the violations matrix for FAC § 14601 apply as follows: Notice of warning / notice of violation for the first violation with 30 days to comply, after which penalties for the second and subsequent violations would apply. $500 for the second violation. $1,000 for each subsequent violation. Sources: FAC §§ 14533, 14601 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2320.3 (a)(1) Organic Input Material Registration (Claims of compliance to the NOP)	A fertilizing material shall be considered to be an organic input material requiring label registration if the fertilizing material is making claims of compliance to the United States Department of Agriculture, National Organic Program (NOP) standards, or claims for use in organic crop and food production, including but not limited to, submission by the supplier, distributor, or manufacturer for listing by a third-party organic input material review organization recognized by the NOP.			X	The penalties shown in the violations matrix for FAC § 14681(a) and/or (c) apply as follows: $1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14550.5, 14601, 14651.5, 14681 3 CCR § 2322(a)(1)
3 CCR § 2320.3 (a)(2) Organic Input Material Registration (Claims on labels, literature, website, social media, etc.)	A fertilizing material shall be considered to be an organic input material requiring label registration if the fertilizing material includes claims on labels, labeling, literature or extensions of labels, such as websites or social media outlets, or other electronic or verbal communications that the products are suitable for use in organic crop and food production system.			X	The penalties shown in the violations matrix for FAC § 14681(a) and/or (c) apply as follows: $1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14550.5, 14601, 14651.5, 14681 3 CCR § 2322(a)(1)

3 CCR § 2320.4 Use of the term "Organic"	(a) Fertilizing material labels and/or labeling displaying the term "organic" in the licensee's name on the label, logos, slogans, or brand names, shall be registered as an organic input material or shall comply with subsection (c) by December 31, 2015. (b) Label and labeling claims implying that a product is suitable for organic crop and food production shall be registered as an organic input material or shall comply with subsection (c). Organic claims include, but are not limited to, the following: Organic gardening, certified organic, and compliance with National Organic program (NOP) standards. (c) The use of the term "organic" on fertilizing materials labels and/or labeling, as described in sections (a) and (b) of this section, not meeting the NOP standards shall include one of the following declarations: "Not for use in organic crop and organic food production in the State of California." or "Not for use in organic crop and organic food production." (1) The declaration shall appear in the principal display panel of the label. (2) The declaration shall be in such a style of type of lettering as to be clearly and conspicuously presented with respect to other type, lettering, or graphic material on the label.			X	The penalties shown in the violations matrix for FAC § 14681(a) and/or (c) apply as follows: $1,000 for the first violation. $2,500 for the second violation. $5,000 for each subsequent violation. For violations that arise from fraud, willful misconduct, gross negligence, or are a threat to public safety, the secretary shall assess a penalty of $5,000 for the initial or any subsequent violation. Sources: FAC §§ 14533, 14540, 14542, 14550.5, 14601, 14651.5, 14681 3 CCR §§ 2300.1(g), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2323(a) Organic Input Material Inspections (Access to Records & Premises)	The secretary shall have free access at reasonable times to all records, premises, production processes, storage facilities, inventories, or conveyances that are used in the manufacture, transportation, importation, distribution, storage, or application of any organic input material.			X	Violations are punishable at $5000. Sources: FAC §§ 14533, 14641, 14550.5, 14651.5 3 CCR § 2322(a)(1)
3 CCR § 2323(c) Organic Input Material Inspections (Maintaining Records)	Organic input material manufacturers shall maintain all the records demonstrating compliance with the NOP standards for a period of five years and submit complete documentation describing all ingredients, manufacturing processes, process control information, laboratory analysis of incoming ingredients and finished products, and other information as required by the secretary.			X	Violations are punishable at $5000. Sources: FAC §§ 14533, 14641, 14550.5, 14651.5 3 CCR § 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2323(d) Organic Input Material Inspections (Sampling)	For the purpose of determining compliance, the secretary shall do all of the following: (1) Take samples of any raw ingredients, finished products, and substances. (2) Take samples at various stages of the manufacturing process. (3) Make analysis or examinations of any raw ingredients, substances, and organic input material.			X	Violations are punishable at $5000. Sources: FAC §§ 14533, 14550.5, 14641, 14651.5 3 CCR §§ 2313, 2315, 2322(a)(1)
3 CCR § 2324 Access for Sampling	Authorized staff may take a sample for analysis from any lot of fertilizing material which is in the possession of any producer, manufacturer, distributor importer, agent, dealer, retailer, or user.			X	Violations are punishable at $5000. Sources: FAC §§ 14530, 14533, 14544, 14641, 14651.5 3 CCR § 2322(a)(1)
3 CCR § 2325 Records Maintenance and Audit	Each licensee shall maintain in this state, or with the secretary's permission at another location, an accurate record of all transactions subject to assessment. These records shall be maintained for a period of not less than three years following the transaction and are subject to audit by the secretary. Records of all transactions subject to assessment shall be made available upon request.		X		$500 for the first violation. $1000 for each subsequent violation. Sources: FAC §§ 14543, 14641, 14651.5 3 CCR §§ 2322(a)(2), 2322(a)(1)

Section Code	Description of Violation	Min.	Mod.	Ser.	Penalty
3 CCR § 2326.1 Mill Assessment Rates	(a) A licensee whose name appears on the label who sells or distributes bulk fertilizing materials, as defined in Food and Agricultural Code Sections 14517 and 14533, to unlicensed purchasers, shall pay to the secretary an assessment of two mills ($0.002) per dollar of sales for all sales of fertilizing materials. A licensee whose name appears on the label of packaged fertilizing materials, as defined in Food and Agricultural Code Sections 14533 and 14551, shall pay to the secretary an assessment of two mills ($0.002) per dollar of sales of all sales of fertilizing materials. (b) In addition to the assessment provided in subdivision (a), the secretary establishes the mill assessment on fertilizing materials products at one mill ($0.001) per dollar of sales for all sales of fertilizing materials, to provide funding for research and education regarding the use and handling of fertilizing materials pursuant to Food and Agricultural Code section 14611(b).	X			The penalties shown in the violations matrix for FAC § 14611 apply as follows: For non-submittal of each quarterly mill assessment, the first violation shall receive a notice of warning / notice of violation with 30 days to comply, after which penalties for the subsequent violations would apply. $1,000 for each subsequent violation. Any delinquent payment is subject to a penalty of 15 percent of the delinquent payment. Sources: FAC §§ 14517, 14533, 14543, 14551, 14611, 14613 3 CCR §§ 2322(a)(3), 2322(a)(2), 2322(a)(1), 2326.2

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Note: Authority cited: Sections 407, 14502, 14651, 14651.5 and 14655, Food and Agricultural Code.
Reference: Sections 14601, 14613, 14623, 14641, 14651.5, 14653, 14655, 14681 and 14682, Food and Agricultural Code.

§ 2322.1. Filing Deadlines and Procedures.

(a) A respondent may contest a notice of adverse determination, including a notice to deny a right, authority, license or privilege or the renewal thereof, for any violation specified in Section 2322 within 30 calendar days from the date of the notice of proposed action by submitting a written request to the Legal Office of Hearings and Appeals of the Department of Food and Agriculture, 1220 N Street, Room 315, Sacramento, California 95814. Any objection to the Department's selection of the informal hearing procedure shall be made in writing to the Legal Office of Hearings and Appeals and shall be resolved by the Hearing Officer prior to the hearing.

(b) Failure to present a timely request for a hearing constitutes a waiver of the respondent's right to contest the notice of an adverse determination.

(c) If the notice of adverse determination places a hold on a fertilizing material product, or requires a person to cease operations, the notice of adverse determination shall remain in effect pending the outcome of the informal hearing.

Note: Authority cited: Section 407, Food and Agricultural Code; and Section 11400.20, Government Code.
Reference: Section 14651.5, Food and Agricultural Code; and Section 11445.30, Government Code.

§ 2322.2. Hearing Schedule and Notification.

(a) The Legal Office of Hearings and Appeals shall schedule an informal hearing within 30 days from the receipt of a written request from the respondent.

(b) Formal hearings shall be scheduled by the Department consistent with the provisions of Chapter 5 (commencing with Section 11500), Part 1, Division 3, Title 2 of the Government Code, and any applicable regulations enacted pursuant to these provisions.

(c) The Department shall provide a notice of the informal hearing to the respondent containing the following information:

(1) Date, location, and time of the informal hearing;

(2) Departmental contact information including applicable telephone and facsimile numbers;

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(3) Subject matter of the adverse determination; and,

(4) Any other information or documentation relative to the adverse determination.

(d) The notice of hearing shall be sent to the address of the person charged, as provided by any license or registration issued by the Department.

(e) A notice that is sent pursuant to subsection (d) shall be considered effective, even if delivery is refused or if the notice is not accepted at that address.

Note: Authority cited: Section 407, Food and Agricultural Code; and Section 11400.20, Government Code.
Reference: Sections 11501, 11502 and 11503, Government Code.

§ 2322.3. Hearing Procedures.

(a) Hearings shall be presided over and conducted by a Hearing Officer designated by the secretary.

(b) The standard of proof to be applied by the Hearing Officer shall be the preponderance of the evidence.

(c) Hearings may be conducted by telephone, at the discretion of the Hearing Officer.

(d) The decision of the Hearing Officer shall be in writing. It may be handwritten.

(e) The decision shall be issued within 30 days after the conclusion of the hearing and may be issued orally at the conclusion of the hearing subject to written confirmation.

(f) The written decision shall be served on the respondent either by personal service, facsimile transmission, or email.

(g) The Hearing Officer's decision shall be effective immediately upon first articulation under subsection (e) and shall be final and not appealable to the secretary or any other officer of the Department.

(h) The owner may challenge the Hearing Officer's decision by filing a writ of administrative mandamus in the appropriate court pursuant to Code of Civil Procedure Section 1094.5.

(i) Hearings shall be recorded.

Note: Authority cited: Sections 407, 14502, 14651 and 14651.5, Food and Agricultural Code; and Section 11400.20, Government Code.
Reference: Sections 14653, 14655, 14681 and 14682, Food and Agricultural Code; and

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Sections 11425.50 and 11445.10, Government Code.

§ 2323. On Site Inspection of Organic Input Material Manufacturers.

(a) The Secretary shall have free access at reasonable times to all records, premises, production processes, storage facilities, inventories or conveyances that are used in the manufacture, transportation, importation, distribution, storage, or application of any organic input material.

(b) The secretary may accept inspections performed by the following third-party organizations for out-of-state organic input material manufacturers:

(1) Organic material review organizations recognized by the USDA National Organic Program (NOP),

(2) Firms accredited by the International Organization for Standardization,

(3) Certifying agents accredited by the USDA NOP,

(4) Governmental agencies having responsibility in the enforcement of laws regulating the production, distribution, and labeling of fertilizing materials, or

(5) Third-party organizations undergoing departmental training on fertilizing materials inspection protocol.

All inspection records compiled by the third-party organization shall be made available to the secretary upon request. When a third-party organization is conducting a site inspection, the inspection shall be consistent with the secretary's inspection protocol, which requires all locations manufacturing liquid organic input materials with a total nitrogen claim higher than 3% to have at least two inspections per year, one being unannounced. The third-party organization shall notify the department of the date of the inspection at least 72 hours in advance; department representatives may be present at the inspection.

(c) Organic input materials manufacturers shall maintain all the records demonstrating compliance with the NOP standards for a period of five years and submit complete documentation describing all ingredients, manufacturing processes, process control information, laboratory analysis of incoming ingredients and finished products, and other information as required by the Secretary.

(d) For the purpose of determining compliance, the Secretary may do all of the following:

(1) Take samples of any raw ingredients, finished products, and substances.

(2) Take samples at various stages of the manufacturing process.

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(3) Make analysis or examinations of any raw ingredients, substances, and organic input material.

Note: Authority cited: Sections 407, 14502, 14601, 14641 and 14642, Food and Agricultural Code. Reference: Sections 14601 and 14612, Food and Agricultural Code.

§ 2324. Access for Sampling.

Authorized staff may take a sample for analysis from any lot of fertilizing material which is in the possession of any producer, manufacturer, distributor, importer, agent, dealer, retailer, or user.

Note: Authority cited: Sections 407, 14502, 14601, 14641, 14642 and 14645, Food and Agricultural Code. Reference: Section 14645, Food and Agricultural Code.

§ 2325. Records Maintenance and Audit.

Each licensee shall maintain in this state, or with the secretary's permission at another location, an accurate record of all transactions subject to assessment. These records shall be maintained for a period of not less than three years following the transaction and are subject to audit by the secretary. Records of all transactions subject to assessment shall be made available to the Department upon request.

Note: Authority cited: Sections 407, 14502 and 14612, Food and Agricultural Code. Reference: Section 14612, Food and Agricultural Code.

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ARTICLE 7. MILL ASSESSMENTS

§ 2326.1. Mill Assessment Rates.

(a) A licensee whose name appears on the label who sells or distributes bulk fertilizing materials, as defined in Food and Agricultural Code Sections 14517 and 14533, to unlicensed purchasers, shall pay to the secretary an assessment of one and a half mill ($0.0015) per dollar of sales for all sales of fertilizing materials. A licensee whose name appears on the label of packaged fertilizing materials, as defined in Food and Agricultural Code Sections 14533 and 14551, shall pay to the secretary an assessment of one and a half mill ($0.0015) per dollar of sales of all sales of fertilizing materials.

(b) In addition to the assessment provided in subdivision (a), the secretary establishes the mill assessment on fertilizing materials products at one mill ($0.001) per dollar of sales for all sales of fertilizing materials, to provide funding for research and education regarding the use and handling of fertilizing materials pursuant to Food and Agricultural Code section 14611(b).

Note: Authority cited: Sections 407, 14501, 14502 and 14611, Food and Agricultural Code.

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Reference: Sections 14501, 14517, 14533, 14551 and 14611(b), Food and Agricultural Code.

§ 2326.2. Penalties

For any delinquency in making the payment, or any deficiency in payment of the fertilizing materials mill assessment which is received after the date due (one calendar month after March 31, June 30, September 30, and December 31 of each year), a penalty of 15 percent of the amount which is due shall be added.

Note: Authority cited: Sections 407, 14501, 14502, 14611 and 14613, Food and Agricultural Code.
Reference: Sections 14501, 14517, 14533, 14551, 14611 and 14613, Food and Agricultural Code.

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