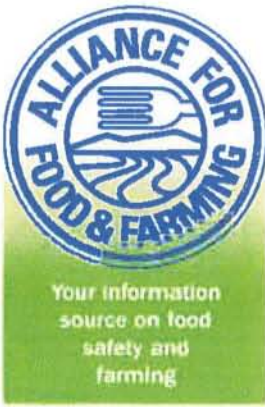


# PREHARVEST FOOD SAFETY PLAN FOR CALIFORNIA CITRUS GROWERS



California Citrus Mutual  
Joel Nelsen, President  
559-592-3790



# Analysis of Produce Related Foodborne Illness Outbreaks

Commissioned by the Alliance for Food and Farming  
January 2010

## Introduction and Background:

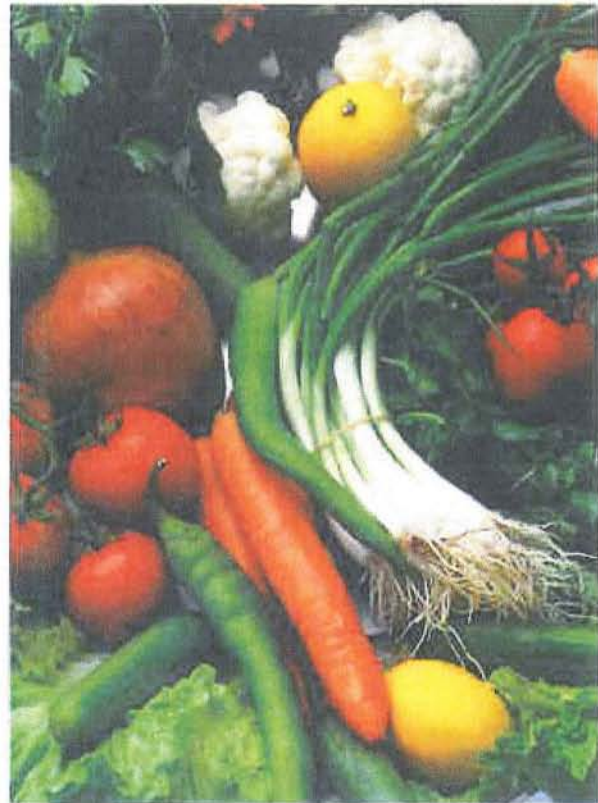
This report was commissioned to analyze data associated with foodborne illness outbreaks and produce. The report analyzes the likely source of an outbreak and divides the data into two categories: 1) outbreaks associated with the growing, packing, shipping or processing of produce 2) outbreaks associated with improper handling of produce after leaving the farm or shipping facility.

The analysis was done to provide the produce industry with better information about foodborne illness outbreaks. While other reports have examined similar data, the Alliance's analysis is unique because it identifies where the contamination occurred to provide needed perspective and information for farmers, retail chains, restaurants and consumers.

While we all share in the responsibility of food safety throughout the food chain, it is understood that providing safe food must start on the farm. While percentages of on-farm contamination remains relatively low, the produce industry must continue to make strides toward improvement. Two percent is still too high. We must work to get that percentage to zero.

Data analyzed for this report included:

1. The CDC U.S. Foodborne Disease Outbreaks Report Annual databases for 1996-2007
2. The CDC U.S. Foodborne Disease Outbreaks Report Searchable database 1990-1995



### Key Findings:

Approximately 12.3 percent of all foodborne outbreaks from 1990 to 2007 were associated with produce. Of that, 10% were associated with improper handling after leaving the farm and 2.2% were associated with the growing, packing, shipping or processing of produce.

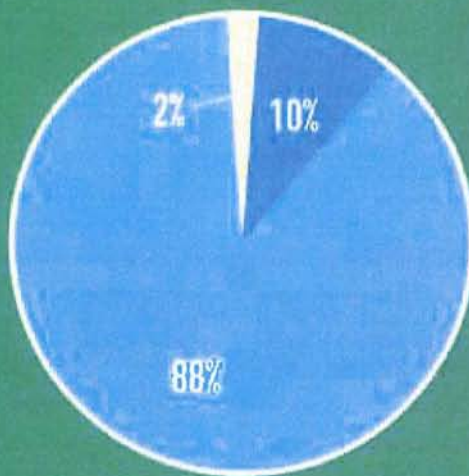
The report also analyzed the percentage of illnesses that are associated with produce-related outbreaks. In that analysis, 21.9 percent of all foodborne illnesses were associated with produce. Of that, 15.8 percent were a result of improper handling after leaving the farm and

6.1% of illnesses were associated with the growing, packing or shipping of produce.

Foods items other than produce caused 87.7% of the outbreaks or 78.1% of the foodborne illnesses from 1990 to 2007.

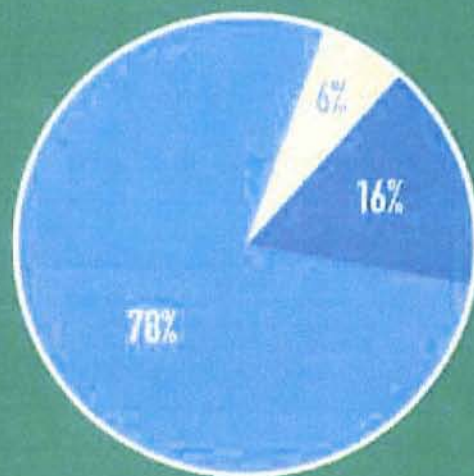
Again, emphasis must be placed upon reducing further the incidents of on-farm contamination. Through applied research, continued and increased diligence on behalf of farmers and shippers and increased oversight, on-farm microbial contamination can be further mitigated.

1990 – 2007  
All Outbreaks of Confirmed Etiology



- Produce related outbreaks associated with growing, packing, shipping, or processing
- Produce related outbreaks associated with improper handling after leaving the farm
- Other foodborne related outbreaks

1990 – 2007  
All Illnesses of Confirmed Etiology



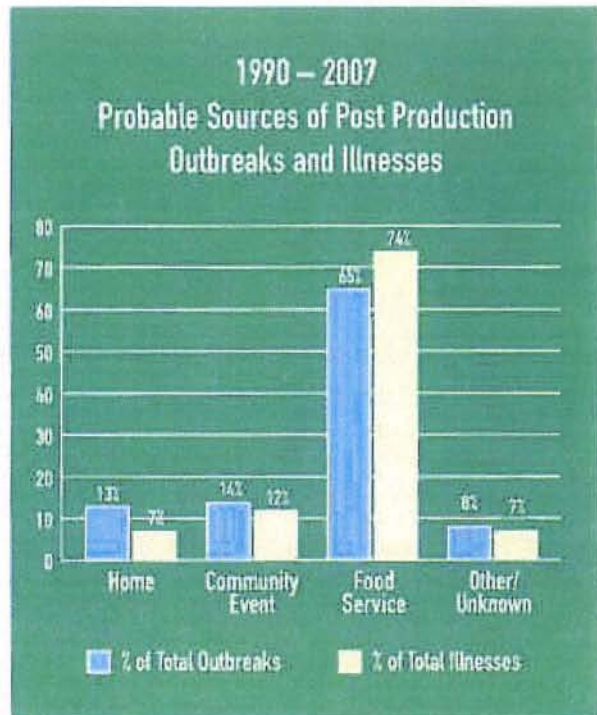
- Produce related illnesses associated with growing, packing, shipping, or processing
- Produce related illnesses associated with improper handling after leaving the farm
- Other foodborne related illnesses

*In cases where it was not reasonably certain, the default category was "the growing, packing, shipping or processing of produce."*

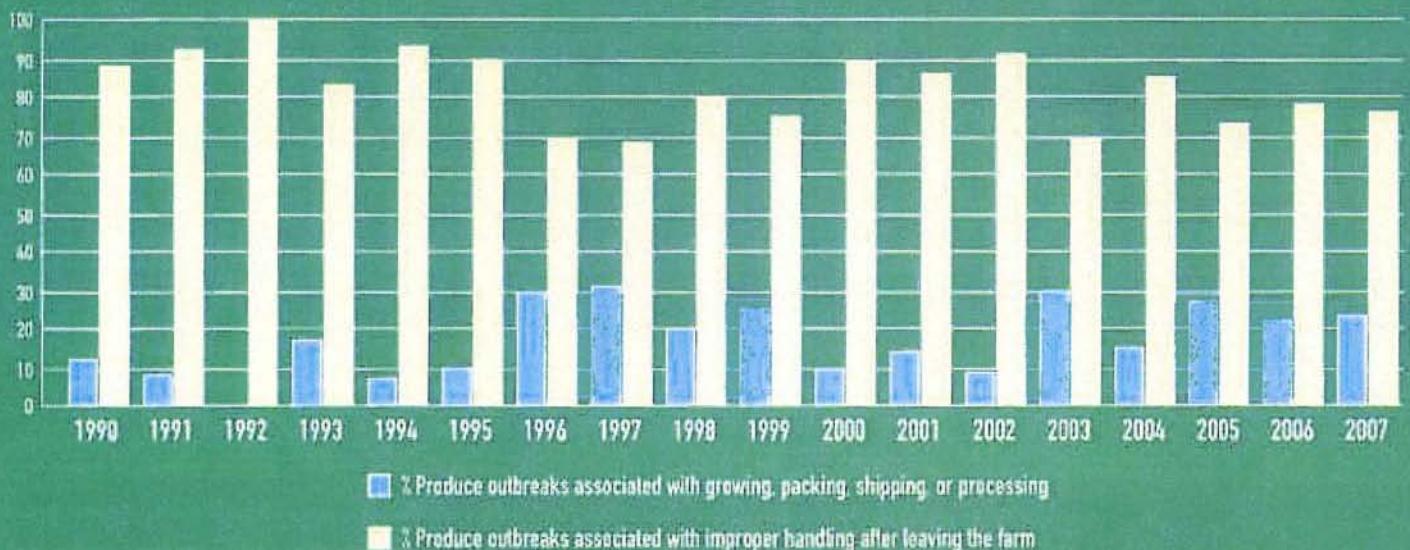
### Key Findings:

The vast majority of foodborne illness outbreaks associated with produce contaminated after leaving the farm is attributed to mishandling at the foodservice level (65% of outbreaks and 74% of illnesses). This is followed by mishandling at community events (14% of outbreaks) and mishandling in the home (13% of outbreaks).

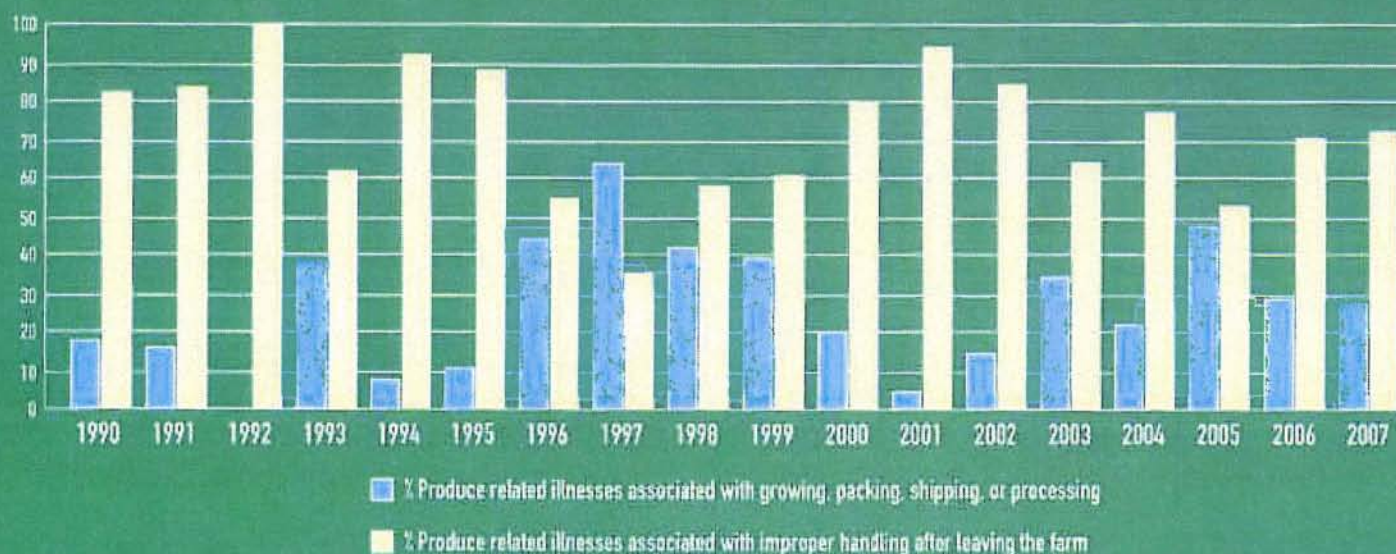
These statistics underscore the importance of vigilance at all levels of the food chain. Along with efforts on the farm, efforts to reduce microbial contamination of produce at both the foodservice and consumer levels must also be enhanced and improved. With the majority of produce being consumed in a raw form, diligence by restaurants and by consumers must be emphasized if we are to reduce the incidents of foodborne illness.



### Produce Associated Outbreaks Comparing Farm to Post Production



## Produce Associated Illnesses Comparing Farm to Post Production



### Summary and Recommendations:

Fresh produce comes from multiple sources and countries depending on weather and the season. It is often widely distributed and eaten without further processing. Since fresh produce is often not cooked before consumption, it is susceptible to contamination and must be handled carefully at all levels, including the farm, the shipper, the processor, foodservice operators, retailers and consumers.

It is important to note that no health official is recommending that consumers stop or reduce consumption of fresh fruits and vegetables. In fact, consumers should be encouraged to eat more fresh produce both in the home and when eating out. However, the report findings show that both consumers and restaurant employees need more training and education on proper handling to avoid cross contamination with fresh produce. Consumer groups and restaurant trade associations involved in efforts to reduce foodborne illnesses and

outbreaks may want to consider expanding food safety education and outreach efforts regarding the safe handling of fresh fruits and vegetables. These groups could also consider providing increased support for food safety education programs like FightBac.

Regarding agriculture, it is important to reduce any on-farm incidents of foodborne outbreaks and industry must continue its efforts to implement processes which have been successful in reducing on-farm risks. Agricultural associations and organizations must continue to conduct research, implement food safety programs, and prioritize outreach education for farmers, shippers and processors. Further the agriculture industry must support education programs, like FightBac, for the foodservice industry and consumers to encourage and promote the safe and careful handling of fresh fruit and vegetables after leaving the farm.

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**Author:** This report was commissioned by the Alliance for Food and Farming. Analysis was conducted by Marilyn L. Duman, M.S. Duman holds a Master of Science degree from the University of Hawaii and is a private consultant who specializes in biochemistry and biostatistics.



## Cleaning Cows from Inside Out



Cows seem to enjoy orange peel and pulp. But these citrus byproducts are more than just tasty and nutritious; they also have an antimicrobial effect in the cows's gut. (D2336-1)

Who knew? Those thick, sharp-tasting orange peels that people would never dream of eating are "snack heaven" for cows. Not only does the cow get good roughage and vitamins, but it also gets an antimicrobial boost from the peel's essential oils. That's partly because the peel contains a compound called "d-limonene," which is used in many cleaning products as an antimicrobial agent. And since adult cows can have 1 trillion or more microbes in 1 ounce of rumen fluid, there are lots to mop up!

Although experts consider the U.S. food supply to be very safe, millions of Americans become ill each year due to foodborne pathogenic bacteria. *Salmonella enterica* is a common foodborne pathogenic bacterium that is among the spectrum of microbes found inside the intestines of cattle, swine, and poultry. Transient or harmless organisms, as well as beneficial ones, are also among those intestinal microbes.

Because pathogenic *Salmonella* can be found in the live food animal, reducing its populations in the gastrointestinal tract could potentially improve food safety because fewer pathogenic bacteria would be present during slaughter and processing.

Several naturally occurring plant chemicals have shown promise as antibacterials in a variety of applications. Citrus essential oils, for example, have been part of the human diet for hundreds of years, and their effects on bacterial growth and survival are well studied. Citrus oils have been known to kill *Staphylococcus aureus*, *Pseudomonas*, *Salmonella*, and *Escherichia coli*.

### An Unlikely Cleanser

A team of researchers recognized the potential of citrus byproducts as a possible food safety intervention and has been experimenting with them since 1999. The team consists of [Agricultural Research Service](#) microbiologist Todd R. Callaway and animal scientist Tom S. Edrington, with the Food and Feed Safety Research Unit in College Station, Texas; ARS animal scientist and research leader Jeffery Carroll with the Livestock Issues Research Unit in Lubbock, Texas; and John Arthington at the University of Florida in Ona. "While foodborne pathogens are found in the gut of food animals, non-antibiotic methods to reduce such pathogens in the live animal are important to improving food safety," says Callaway.

Initial laboratory results published in 2005 indicated that citrus products included in ruminant rations decreased pregastric gut and lower-gut populations of *E. coli* O157:H7 and a variant of *S. enterica*, *S. Typhimurium*, without causing a significant change in fermentation end products. These end products include acetate, which is a volatile fatty acid. Certain beneficial bacteria in the cow's gut produce these acids, which are absorbed by the animal to provide energy.

"Cows have evolved to depend on volatile fatty acids—or VFAs—for nearly all their energy needs," says Callaway. "Absorption of VFAs is necessary, and if there is a large disruption in VFA absorption, then there is also a disruption to the animal's efficiency, productivity, and health."

Callaway's early data showed the feasibility of using orange pulp as a feed source to provide antipathogenic activity in cattle. He also showed that citrus byproducts (orange peel and pulp) are compatible with current production practices, are palatable to the animals, and can be a "green" solution. Another plus—citrus byproducts are also economically feasible and readily available.

While citrus byproducts are fed to cattle because of their high nutritive value and low cost, Callaway has been shedding more light on how to exploit the essential oils inside the peel and pulp that are natural antimicrobials. Collaborations with University of Arkansas-Fayetteville researchers Steven Ricke and Philip Crandall have identified specific essential oils that kill



Orange peel and pulp are palatable to cattle. After ARS scientists at College Station, Texas, found that to be true, they conducted studies that show these citrus byproducts have an antimicrobial effect in the animal's gut. (D2336-2)



Microbiologist Todd Callaway looks on as a colleague feeds a dairy cow some orange peel and pulp. Callaway and his team have found that orange byproducts can reduce gastric populations of *Salmonella* and *E. coli* in cattle, sheep, and pigs. (D2335-1)

pathogenic bacteria.

In other laboratory tests, Callaway's research group has demonstrated that the addition of a small amount of orange peel and pulp to a mixture of laboratory ruminal fluid fermentations reduced populations of *E. coli* O157:H7 and *S. Typhimurium*. The amount given was considered similar to a realistic amount ingested on a farm. The 2008 study, which was coauthored with Carroll, Arthington, and University of Arkansas researchers, was published in *Foodborne Pathogens and Disease*.

Callaway's further studies demonstrated that feeding orange peel and pulp reduced intestinal populations of diarrhea-causing *E. coli* in weaned swine. That study, also led by Carroll and coauthored with Callaway, was published in 2010 in the *Journal of Animal and Veterinary Advances*.

#### From Heavy Peels to Pellets

From the time Callaway began studying citrus as an animal gut cleanser, he also recognized that citrus peel can be heavy and expensive to ship long distances. "Even as compost, citrus peels are difficult to transport," he says.

Thus, Callaway's latest studies investigated the use of processed orange peel pellets. The team fed the pellets to sheep as a model for cows for 8 days. They found a 10-fold reduction in *Salmonella* and *E. coli* O157:H7 in the animals' intestinal contents. Callaway received a grant from the National Cattlemen's Beef Association (Beef Checkoff funds) to help fund the work. These studies were accepted for publication in 2011 in the *Journal of Food Protection and Foodborne Pathogens and Disease*.

"When approaching preharvest food safety, we take a 'multiple-hurdle' approach," says Callaway. "These studies have the potential to lead to one more in a series of hurdles set up to prevent spread of foodborne pathogens." Processing plants, for example, depend on multiple hurdles for keeping pathogens at bay. A method of reducing the presence of pathogens in live animals before they enter processing plants could possibly be a key hurdle to add to their list.

Callaway is now preparing upcoming field trials of citrus byproducts with collaborators at ARS, the University of Arkansas, and the University of Florida.—By [Rosalie Marion Bliss](#), Agricultural Research Service Information Staff.

This research is part of Food Safety, an ARS national program (#108) described at [www.nps.ars.usda.gov](http://www.nps.ars.usda.gov).

[Todd R. Callaway](#) is in the USDA-ARS [Food and Feed Safety Research Unit](#), 2881 F&B Road, College Station, TX 77845; (979) 260-9374.

"Cleaning Cows from Inside Out" was published in the [November/December 2011](#) issue of *Agricultural Research* magazine.

[\[Top\]](#)

Last Modified: 01/29/2012



Graduate student Jacquelyn Escarcha inserts samples developed from cattle fecal waste into a solution that detects *Salmonella*. (D2333-1)





DEPARTMENT OF HEALTH & HUMAN SERVICES

RECEIVED

FEB 23 2012

Food and Drug Administration  
Silver Spring, MD 20993

Congressman Jim Costa  
Washington, DC Office

FEB 21 2012

The Honorable Jim Costa  
House of Representatives  
Washington, D.C. 20515-0520

Dear Mr. Costa:

Thank you for your letter of December 22, 2011, cosigned by four of your colleagues, regarding concerns you have heard from some industry members about the draft produce safety requirements, which the Food and Drug Administration (FDA or the Agency) is required to publish by section 105 (Standards for Produce Safety) of the FDA Food Safety Modernization Act (FSMA). Specifically, your letter encouraged FDA, in developing the produce safety standards, to take a commodity-specific, risk-based approach as opposed to a practices-based approach. Your letter also encouraged FDA to continue to work with the growers, handlers, and processors to develop commonsense and effective regulations.

As you know, section 105 of FSMA requires FDA to establish science-based minimum standards for the safe production and harvesting of those types of fruits and vegetables for which the Secretary of the Department of Health and Human Services has determined that such standards minimize the risk of serious adverse health consequences or death. FDA expects to publish for comment the proposed produce safety rule in the next few months.

We agree with you about the importance of continuing to engage the affected industry and other stakeholders as we move forward to develop and implement the new produce safety requirements. The information obtained through this collaborative approach is essential to inform our rulemaking activities and to help the affected industry implement these important public health measures.

We also recognize the tremendous diversity of the produce industry, not just in terms of the size of farming operations, but also in the types of crops grown and the growing methods used. FDA recognizes that the new safety standards must be flexible enough to account for this diversity and also be practical to implement.

FDA has undertaken significant efforts to engage our stakeholders, including industry, academia, and consumers, to obtain input to inform the development of the proposed rule. We also have been working closely with the U.S. Department of Agriculture (USDA), the Environmental Protection Agency, and state departments of agriculture. In early 2010, long before enactment of FSMA, the Agency established a docket to solicit information

about current practices and conditions for the production and packing of fresh produce. The Agency received approximately 880 comments to this docket.

In addition, the Agency initiated multiple produce industry listening sessions across the country prior to the passage of FSMA. At these sessions, FDA provided local industry and academia an opportunity to ask questions and voice concerns about the potential for legislation impacting the produce industry. FDA and USDA technical experts, scientists, and managers participated in these meetings. Agency staff visited a total of 13 states with significant produce production in 2010, where staff toured large and small-scale farms and talked to people with practical experience in food production and in implementing food safety programs on farms. Since the enactment of FSMA, FDA has continued to engage with our stakeholders.

Through this extensive engagement with the farming community, we became aware of the significant demand for assistance in the form of technical support and information to help the affected industry implement the new produce safety requirements. To address this need, FDA worked with USDA's Agricultural Marketing Service and Cornell University to establish the Produce Safety Alliance. The alliance is aimed at giving produce growers and packers training, educational materials, and other opportunities to learn about current risk- and science-based best food safety practices and future regulatory requirements.<sup>1</sup>

In your letter, you expressed concerns that that the Agency is considering a practices-based approach as opposed to a commodity-specific approach. FSMA emphasizes the importance of both. It instructs us to include, in the proposed regulation, science-based standards for on-farm risk factors that relate to farm practices, such as soil amendments, hygiene, packaging, temperature controls, animals in the growing area, and water. As we noted earlier, the statute also directs us to establish science-based minimum standards for the safe production and harvesting of those types of fruits and vegetables for which the Secretary has determined that such standards minimize the risk of serious adverse health consequences or death. As we continue to develop the proposed rule, the Agency is taking note of all input, including the recent industry concerns that you have heard. ↙

We agree that it is important to consider lessons learned from past outbreak investigations. Outbreak investigations provide vital information not only about the food vehicle and pathogen responsible for the illnesses but also about the practices and conditions that may have contributed to the contamination that caused the outbreak.

As noted earlier, FDA has not yet issued the proposed standards. Once the proposal has been published, there will be an opportunity for public comment, including a series of public meetings held at various locations throughout the country. FDA will consider all comments, including the input from the public meetings, before finalizing the new requirements.

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<sup>1</sup> <http://producesafetyalliance.cornell.edu/psa.html>

Page 3 – The Honorable Jim Costa

Thank you, again, for contacting us concerning this matter. Please let us know if you have further questions or concerns. The same letter has been sent to your cosigners.

Sincerely,

Handwritten signature in blue ink that reads "Michelle Vital".Handwritten initials "to" in blue ink.

Jeanne Ireland  
Assistant Commissioner  
for Legislation

**FOOD SAFETY**  
**GOOD AGRICULTURAL PRACTICES**  
**(GAP)**  
**FOR**  
**CALIFORNIA CITRUS GROWERS**

**October 26, 2010**

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# GOOD AGRICULTURAL PRACTICES (GAP) FOR CALIFORNIA CITRUS GROWERS

## Introduction

*Food Safety Good Agricultural Practices for California Citrus Growers (GAPs)* is focused on the grower's particular role in providing safe citrus fruits for consumers and designed to be a guide in developing a food safety plan. These GAPs do not cover harvesting or postharvest handling outside of the grove. Other steps in the distribution chain should be managed to ensure that food safety principles are applied all the way to the consumer.

Many of the practices included in this document are already implemented by prudent growers. Each grove has its own set of variables and potential risk factors that need to be carefully evaluated and documented with the implementation of this GAPs program. Inherent in the GAPs for citrus is the understanding that citrus naturally has a low risk of contamination and there has never been a documented case of food-borne illness from fresh citrus consumption. Nevertheless, the implementation of these GAPs is extremely important to the continued success of the industry.

Documentation is essential for successful implementation of a GAPs plan. To regulators and retail auditors, food safety practices are not considered implemented unless they are documented.

## FOOD SAFETY – DEFINITIONS

*Adequate* - satisfactory for a particular purpose

*Agricultural Water* - water used for irrigation, cooling frost protection or as a carrier for fertilizers or pesticides

*Clean-washed* - rinsed and or reasonably free of dust, dirt, food residues and other debris

*Documentation* - a written procedure or record of a task being completed

*Pathogen* - a microorganism capable of causing human disease or injury

*Personal service area* - an area not used for production but for medical services, dressing, toilet use, washing and eating

*Pest* - any animal or insect of public health significance that may carry pathogens and that can contaminate fruit or food contact surfaces

*Post-Harvest Activity* - any activity that takes place after the citrus fruit is picked

*Shall* - Must be done

*Should* - recommended or advisory measures.

## **FOOD SAFETY - FIELD ASSESSMENT**

### **General Requirements**

- The field assessment will be part of a written food safety plan. It should be reviewed annually and updated and corrective actions taken if needed or when changes occur.
- The assessment should include:
  - Evidence of activity of animals of concern in or around the grove
  - Evaluation of adjacent land use for possible sources of contamination
  - A review of previous land use - (if the planting is less than five years old)
  - Flood events
  - Water use and sources
  - Use of soil amendments that contain animal waste or byproducts
  - On farm sewage systems
  - Availability, location and maintenance of toilet facilities and hand washing sites
  - A grove or ranch map that identifies water sources, permanent water distribution systems, sewage/septic systems, manure storage sites, adjacent land uses, etc.

### **Land Use Issues**

- New Plantings: The grower should evaluate previous land-use history for possible sources of contamination.
  - Animal feeding operations, dairy farms, poultry operations, pasture land, composting operations, manure storage, landfills and sewage treatment are some examples to consider as possible sources of contamination.
- All Plantings: Factors such as topography, wind direction and water movement relative to the location of the grove should be considered.
  - The grower should document an evaluation of any grove sewage treatment or septic system at least annually to verify it is maintained in a manner to prevent contamination of the grove or citrus fruits and is in compliance with local laws and regulations.
  - When previous land-use history or adjacent land-use indicate a likely pathogen contamination, growers should consider preventative measures and corrective actions as needed to minimize the potential for an adverse public health impact.

A documented evaluation of potential contamination should be conducted following any significant flood event. Citrus fruits that are submerged in flood water shall be excluded from harvest for human consumption.

## **FOOD SAFETY - AGRICULTURAL WATER FOR FIELD USE**

The water quality should be adequate for its intended use. Some examples of intended use would be irrigation (if it contacts the fruit), hand washing, cleaning of food contact equipment or foliar treatments.

### **Assessment of Water Source**

- The grower should identify and document all the water sources (well, canal, reservoir, etc.) and should assess the adequacy of each for its intended uses. This assessment should include factors such as:
  - Contact of water with fruit or fruit-contact surfaces.
  - Identifying potential sources of contamination of agricultural water at its source and during distribution and holding.

### **Assessment of Water Distribution System**

- Water systems intended to convey untreated human or animal waste shall not be utilized to deliver agricultural water.
- The grower should prepare a description of the water distribution systems in use.
  - The description should include maps of permanent fixtures and follow the water distribution system including holding systems, reservoirs, water captured for re-use, etc.
- The grower should perform an assessment of the risk factors and the vulnerability of a water system to contamination from animals, adjacent land activities or storm run-off. Corrective actions and preventive measures such as berms, ditches or fencing should be implemented and documented if potential for contamination is identified.
- The grower should include an on-site inspection of the water system where the system is under the control of the grower.
- Reclaimed water, if used, shall be subject to applicable local, state and federal regulations and standards.

### **Assessment of Water Use in Crop Production**

- Where water may come in contact with fruit, growers should assess the use and quality of water to identify conditions that may result in contamination.

Based on this assessment growers should take appropriate action such as water treatment for foliar sprays and/or identifying alternate water sources to eliminate or minimize the potential for contamination.



### **Microbial Testing of Agricultural Water**

To ensure that the highest quality water available is used it is recommended that, at a minimum, annual testing for generic *E. coli* should be conducted on water that directly contacts fruit.

## **FOOD SAFETY - SOIL AMENDMENTS/CROP TREATMENTS**

### **Biosolids**

- Although biosolids or sewage sludge are seldom used and strongly discouraged for citrus production, a grower who uses biosolids in citrus production must stringently follow all Federal (40 CFR Part 503), state and local requirements.
- If biosolids are used, additional assessments and a high level of control should be carried out to prevent contamination of fruit and equipment.

### **Soil Amendments that Contain Manure**

- Soil amendments that contain manure should be applied in a way that prevents contact with fruit.
- When applying manure consideration should be given to the timing of the application relative to harvest to avoid contamination of bins and harvest equipment.
- Growers should document the supplier name and address, and method and dates of application.
- Soil amendments that contain manure should be stored in a manner and location to minimize potential for contamination of the crop. Potential means of contamination include wind and water.

### **Crop Treatments that Contain Animal Products**

- Non-synthetic crop treatments that contain animal products:
  - Non-synthetic crop treatments may include compost teas, fish emulsion, fish meal, blood meal and others.
  - Growers should obtain from the supplier verification of the composting or treatment process and a certificate of analysis. Growers should document the supplier name and address, and method and dates of application.

- Crop treatments that contain animal products should be stored in a manner and location to minimize potential for contamination of the crop. Potential means of contamination include wind and water.

## **FOOD SAFETY - WORKER HEALTH AND HYGIENE**

### **Personal Health and Hygiene**

- Workers having direct contact with fruit should be required to wash hands before starting work, after using the toilet, after each break and at any other time when their hands may have become a source of contamination. Hand sanitizers should not be used as a substitute for hand washing.
- Workers and visitors who show signs of illness (such as diarrhea, fever, vomiting) should be restricted from the production grove.
- Workers and visitors who have an open sore or lesion must effectively cover it or should be restricted from the production grove.
- Growers should require that workers report to work in clean clothes and practice good personal hygiene.

### **Grove Sanitation**

- Any structures, equipment and containers used in the grove to contain or contact citrus fruits should be cleaned and where appropriate sanitized to prevent contamination with pathogens.
- The introduction of foods and extraneous materials as well as eating and drinking other than water, should be prohibited except in clearly designated personal service areas separate from the production area.
- Personal service areas for workers should be maintained so as not to be a source of contamination and these areas should be located away from produce handling areas.
- All fruit that comes in contact with blood must be disposed of.
- Glass containers should not be brought into groves, unless needed for production purposes.

## Training

- Growers or their representatives should ensure that training is provided and documented for all workers on proper grove sanitation and personal health and hygiene practices. Documentation should include topics covered, date and names of those in attendance. Training should be conducted on initial hiring and semiannually.
- All workers should be trained on job responsibilities that impact food safety.
- Training should include the following:
  - potential sources of contamination
  - identification of potential contamination of fruit or equipment
  - hand washing techniques
  - use of toilet facilities (including disposal of used toilet paper in the toilet-not on floor) proper glove use and storage; proper trash disposal
  - food consumption only outside production area
  - proper handling and storage of equipment
  - no glass containers brought into grove
  - nothing but fruit put in bins
  - prompt treatment for cuts, abrasions and other injuries
  - reporting signs of illness to the supervisor before beginning work or as soon as they become apparent

## Visitors

- Growers should ensure that all visitors comply with all established grove sanitation and personal health and hygiene practices.

# FOOD SAFETY - SANITATION

## Toilet Facilities and Hand-Washing Stations

- There should be regular maintenance on all toilet facilities and hand washing stations including:
  - sufficient supplies of:
    - water (water used for hand washing should meet the microbial standards for drinking water prescribed in 40CFR 141.63)
    - toilet paper
    - soap
    - single use paper towels
  - proper accessible location for field workers and located to minimize risk for field and citrus fruit contamination.
  - easily accessible for servicing and serviced on an adequate schedule

- Wash and rinse water should be contained and not allowed to flow onto ground.
- Toilet facilities should be placed in an area that minimizes risk for field and citrus fruit contamination, but easily accessible for field workers. Facilities will comply with State and Federal law.
- If facilities are to be cleaned or serviced near the grove, appropriate physical barriers or containment practices should be in place in the event of a spill. Toilet facilities should be serviced at least weekly.

## **FOOD SAFETY – ANIMALS**

### **Animal Assessment**

- The grower should assess the impact of domestic, livestock and wild animal activity for potential pathogen contamination of the grove and fruit. The assessment should include the extent of intrusion, nearness to the grove, proximity to harvest and other relevant factors.
- Based on the assessment, the grower should put into place measures to exclude domestic animals and minimize the intrusion of wildlife into the grove.

### **Monitoring**

- The grower should monitor the grove and adjacent land for evidence of animal activity and the potential for contamination of fruit or equipment.
- The grower should return bins to packers if there is evidence of contamination.
- When the assessment or monitoring indicates possibility of contamination with pathogens, the grower should take action as needed to minimize potential for contamination of the fruit and to prevent the harvest of any potentially contaminated fruit.

### **Pre-Harvest**

- Prior to harvest, the grower should perform a documented evaluation of the grove environment for changes that may be likely to result in contamination of the citrus fruit with pathogens. Evaluation should include inspection for:
  - Evidence of animal intrusion such as downed fences, presence of live or dead animals, animal tracks or animal feces. If animal intrusion is detected, measures shall be taken to remove or prevent from harvest any potentially contaminated product.
  - Presence of potentially contaminating materials (e.g. uncomposted manure, etc.) likely to pose a contamination risk to the grove to be harvested.
  - Evidence that the irrigation water source and delivery system may potentially be compromised.

- Any other potential contamination risks present.

## **PESTICIDE USE**

- Pesticide usage shall comply with all federal, state and local laws and regulations.
- Pesticides shall be applied in accordance with the label instructions.
- Records should be available to the packer.
- Pesticides shall be stored in a manner and location to prevent contamination of fruit, equipment or water sources.
- Residue testing should be conducted on fruit prior to harvest if there is an indication that the product may be out of compliance due to offsite pesticide applications.

## **TRACEABILITY**

### **Traceability at Grove Level:**

- At harvest, records of harvest dates, harvest crews, quantities harvested, subsequent destination of fruit and transporter should be maintained. Outgoing loads should be identified at a minimum with grower block, harvest date and harvest crew. Records should be maintained by the responsible party.
- Growers should maintain records using the same source identification (block ID) used by packers.
- In the event of a product recall in the marketplace an identified lot of fruit must be traceable back to its origin and all recipients of fruit from that lot identified as well. Adequate records of cultural practices as well as sources, methods and timing of inputs used in the grove should be maintained for at least two years and be readily retrievable.

*Areas in red are to be customized to meet company practices*

Insert Company Name

## GROWER FOOD SAFETY

### PREVENTATIVE CONTROLS and CORRECTIVE MEASURES PLAN

Created By:	(Name of individual)	Date Issued:	10/12/2011
Approved by:	<i>(Management approval if applicable)</i>	Replaces Issue Dated:	DRAFT

INSERT COMPANY NAME HERE

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**FOOD SAFETY POLICY**

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It is the policy of *(company name)* to grow fruit that are wholesome and safe for consumption as well as that meet all statutory and regulatory requirements. We accomplish this by adhering to our food safety plan and communicating the need for food safety to employees through documented training programs.

*(Name of person responsible)* is responsible for implementation and review of the Food Safety Good Agricultural Practices program. (Include 24-hour contact information for person) If not available, (\_\_\_\_\_) serves as back-up. (Include contact info.)

Violation of food safety policies by employees is viewed as a disciplinary issue and will be followed up and documented with retraining and using company disciplinary procedures.

Documents and records of procedures and corrective actions meeting each of the food safety standards identified in the food safety plan will be maintained for a minimum of two years.

\_\_\_\_\_  
Signature of owner or CEO

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

STANDARD OPERATING PROCEDURE #1.0

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**ADJACENT AND PREVIOUS LAND USE**

**CONCERN:**

To ensure that adjacent and prior land use, do not represent a likely source of contamination to citrus fruit.

**POLICY:**

Adjacent land use (all plantings) and previous land use (new plantings) will be evaluated for possible sources of contamination through a documented assessment. When necessary, preventative measures and/or corrective actions will be taken to minimize the risk.

**PREVENTATIVE OR CORRECTIVE MEASURES:**

**New Plantings** (plantings less than five years old)

- 1) Previous land use history will be evaluated for possible sources of contamination, including animal feeding, dairy and poultry operations, pasture land, composting operations, manure storage, landfills, sewage treatment facilities, etc.
  - a. Previous land use history will be recorded on the Field Assessment - Previous Land Use Section (*See Appendix 1.*)
  - b. When previous land use history indicates likely pathogen contamination, preventative measures and/or corrective actions that minimize the potential for contamination will be put into place. Preventative measures and corrective actions will vary based on the specific scenario.

**All Plantings:**

- 1) Adjacent land will be assessed for presence of operations or factors that could indicate a potential for contamination. These could include animal husbandry, manure storage, composting or waste storage operations. Factors such as topography, prevailing wind directions and water movement relative to the grove will be assessed for potential to contaminate the grove or fruit.
  2. Adjacent land use will be recorded on the Field Assessment – Adjacent Land Use Section (*See Appendix 1*) and will be reviewed and updated annually at a minimum and when changes occur. Corrective actions/preventative measures will be documented when needed.
    - a. Preventative or Corrective Measures may include establishment of buffer zones, ditches, berms, fence repair, etc.
- 2) An annual evaluation of any grove sewage treatment or septic system will be conducted to ensure that the system is maintained in a manner to prevent contamination to the grove and citrus fruit, and is in compliance with local laws and regulations. The evaluation will be recorded in the Field Assessment – Sewage (*See Appendix 1.*)
- 3) After a significant flood event, a documented evaluation will be conducted and kept on file. Fruit that is submerged in flood water will be excluded from harvest for human consumption.



**DOCUMENTATION:**

- 1) Field Assessment-Previous and Adjacent Land Use Sections
- 2) Sewage Treatment or Septic System Evaluation (when applicable)
- 3) Flood Event Evaluation (when applicable)

STANDARD OPERATING PROCEDURE #2.0

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**AGRICULTURAL WATER USAGE**

**CONCERN:**

Agricultural water used for irrigation, cleaning of food contact equipment, foliar treatments, etc., should not serve as a source of contamination of fruit or food contact surfaces.

**POLICY:**

- Water quality shall be adequate for its intended use. Water source and distribution assessments and water testing will be conducted to ensure water used is adequate.
- Agricultural water will be sourced from a location and in a manner that is compliant with prevailing regulations.
- Reclaimed municipal water will not be used. OR - Water reclaimed from municipal sources, if used, shall be subject to all applicable local, state, and federal regulations and standards.
- Systems intended to convey untreated human or animal waste will not be used or cross connected with conveyances used to deliver water.

**PREVENTATIVE OR CORRECTIVE MEASURES:**

**Water Source Assessments**

- 1) All water sources (well, canal, reservoir, etc.) used will be documented on the Field Assessment – Water Use and Source Section (*See Appendix 1*).
- 2) Contact of water with fruit or fruit contact surfaces will be considered when assessing water quality.
- 3) Where water may come in contact with fruit, sources will be tested annually by an accredited laboratory for level of generic *E. coli*. Documentation of lab accreditation will be acquired and retained. (*See Appendix 3 - Sampling method for microbiological testing of water*).
- 4) Assessments will be reviewed annually and updated when changes occur or when corrective actions/preventative measures are needed.
- 5) The Surface water inspection log (*See Appendix 5*) will be used to assess the adequacy of surface water sources (canal, reservoir) for intended use. This includes evidence of animal intrusion, adjacent land use activities, storm run-off, evidence of contamination, general cleanliness, etc.
- 6) The Well Inspection Log (*See Appendix 5*) will be used to assess the adequacy of each well for its intended use. This includes condition of well components, gradient, cleanliness of surrounding area and other factors that can potentially lead to contamination of the well.
  - a. If a well is contaminated a possible corrective measure would be to shock the well with chlorine.
  - b. If a breach in the well casing has resulted in the well being more susceptible to contamination, the casing should be repaired.
  - c. If the water source cannot be treated or repaired, an alternative source (i.e. different well, etc.) should be used.

Based on the assessment, if preventative or corrective measures are needed, treatment of water used for foliar sprays and/or identifying alternate water sources will be utilized to eliminate or minimize the potential for contamination of fruit.

### **Water Distribution System Assessments**

- 1) A map to show the water distribution system for each grove will be prepared to show permanent fixtures and follow the water distribution system including holding systems, reservoirs, etc. The map will be documented on the Field Assessment – Grove Map (*See Appendix 1*).
- 2) The Water Distribution System Inspection Log (*See Appendix 5*) will be used to assess the risk factors and the vulnerability of the distribution and holding systems to contamination from animals, adjacent land activities and storm run off, where the system is under the control of the grower.
  - a. If necessary based upon the assessment, corrective actions and preventative measures (such as berms, ditches, fencing or deterrents, etc.) will be implemented.

### **DOCUMENTATION:**

- 1) Water Testing Results
- 2) Well or Surface Water Inspection Log
- 3) Water Distribution System Inspection Log
- 4) Field Assessment-Water Use and Source, and Grove Map sections
- 5) NUOCA (*Notice of Unusual Occurrence and Corrective Actions*) log

STANDARD OPERATING PROCEDURE #3.0

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**WATER SAMPLING FOR MICROBIAL TESTING**

**Frequency:** Annually

**Location:** For testing wells, if filtering system is present, then sample is taken after the filter. If there is no filtration system then take sample at the well head. If it cannot be taken at the well head then take the sample at some point after the well head.

**Supplies:** Alcohol wipes, cooler with gel ice packs, rubber gloves, water resistant marker, sterile sample containers, sodium thiosulfate (if testing chlorinated water systems)

**Remarks:**

- Contact the microbiological lab for instructions.
- Do not open sample container until just before taking the water sample.
- At no time should the sampler's fingers come in contact with the inside of the sample container.
- Collect samples in sterile containers. Keep samples cool after collection.
- The time between collection and start of analysis must not exceed 24 hours.
- Use a new pair of rubber gloves for each sample.

**PROCEDURE**

**Preparation:**

1. Using a marker, record Date, Sample Time and Sample Location on an unopened sample container.
2. Proceed to sample area
3. Before opening the sample container, put on rubber gloves.

**Potable Water and Wastewater**

Distribution System

1. If the water sample is to be taken from a distribution system tap without attachments, select a tap that is supplying water from a service pipe directly connected with the main and is not, for example, served from a cistern or storage tank.
2. Disinfect the tap with an alcohol wipe.
3. Open tap fully and let water run to waste for at least 3 minutes or for a time sufficient enough to permit flushing of the entire service line whichever is longer.
4. Slowly fill the container to the line as indicated on the container. Do not let the container overflow if sodium thiosulfate is used.

**Canals, Reservoirs**

1. Samples should be representative of the water that is the source of supply to the distribution system. It is undesirable to take samples too near the bank or too far from the point of drain off, or at depth above or below the point of drain off.
2. Grasp the bottle at its base and plunge into the water source with the neck facing down. Turn the bottle until the neck is pointing slightly upward and the mouth is directed toward current (if any) and allow the bottle to fill. After filling, remove the bottle from water with the neck pointing up, there should be no air gap.
3. Tightly cap the bottle.

**Transportation**

1. Place the sample in the cooler and place a sufficient amount of gel ice packs to keep the sample cold during transport to the lab.
2. Transport to lab.

STANDARD OPERATING PROCEDURE #4.0

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**SOIL AMENDMENTS & CROP TREATMENTS**

**CONCERN:**

Soil amendments that contain manure can serve as a source of contamination of fruit or food contact surfaces.

Choose one option only depending on your practices

*Option A*

**POLICY:**

No animal manure, animal by-products or municipal biosolids of any kind are used. Records are maintained showing all soils amendment composition, supplier, method and dates of application.

**DOCUMENTATION:**

1. Letter of guarantee from suppliers of soil amendments stating that no animal manure or animal by-products are used in their product.
2. Soil amendment application records

*Option B*

**POLICY:**

- Bio-solids and/or sewage sludge will not be used for citrus production unless all federal, state and local requirements are stringently followed, additional assessments are conducted, and a high level of control is carried out to prevent contamination of fruit and equipment. (Include this statement only if biosolids are used.)
- Soil amendments and crop treatments will meet all requirements as stated below.

**PREVENTATIVE OR CONTROL MEASURES:**

**Soil Amendments Containing Manure**

- 1) Amendments will be applied in a manner that prevents contact with fruit.
- 2) Before the application is made, consideration of the time relative to harvest will be made to avoid bin and harvest equipment contamination.
  - a. Crop will not be harvested until at least \_\_\_\_\_ days after application.
- 3) Records of composition, supplier name and address, application method and date of application will be documented on the Soil Amendment/Crop Treatment Application Log. (See Appendix 5)
- 4) If composted manure is used, a letter of guarantee or certificate of analysis will be provided by the supplier and kept on file showing evidence of treatment adequate to eliminate pathogens of human concern.
- 5) Amendments will be stored in a manner and location to minimize the potential for contamination of the crop. Potential means of contamination include wind and water.

**Crop Treatments Containing Animal Products**

- 1) Non-synthetic crop treatments that contain animal products may include compost teas, fish emulsion, fish and blood meal, and others.

- 2) Supplier name and address, application method and date of application will be documented on the Soil Amendment/Crop Treatment Application Log. *(See Appendix 5)*
  - a. A Letter of Guarantee from the supplier will be kept on file to verify the compost/treatment process.
  - b. A Certificate of Analysis from the supplier will be kept on file to verify testing was completed.
- 3) Materials will be stored in a manner and location to minimize the potential for contamination of the crop.

**DOCUMENTATION:**

1. Soil Amendment/Crop Treatment Application Log
2. Letters of Guarantee and Certificates of Analysis (if applicable)

**FOOD SAFETY PLAN**

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STANDARD OPERATING PROCEDURE #5.0

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**WORKER HEALTH & HYGIENE and GROVE SANITATION**

**CONCERN:**

The potential for contamination can increase if worker health and hygiene practices and grove sanitation procedures are not followed.

**POLICY:**

All grove workers and visitors must comply with the company's Worker Health & Hygiene and Grove Sanitation procedures.

**PREVENTATIVE OR CORRECTIVE MEASURES:**

**Training**

- 1) All workers will be trained upon initial hire and will receive updates semiannually. All training will be documented on the Worker Training Log (*See Appendix 5*), including topics covered, date, trainer name and names of those employees in attendance.
- 2) All workers will be trained on the Personal Health & Hygiene and Grove Sanitation procedures, as well as job responsibilities that impact food safety, in accordance with the Worker Food Safety Training Guide (*See Appendix 2*) for topics covered.

**Worker Health and Hygiene**

- 1) Workers having direct contact with fruit are required to wash hands before starting work, after using the toilet, after each break, and at any other time when hands may have become a source of contamination. Hand Sanitizers are not a substitute for hand washing.
- 2) Toilet facilities will be used by all workers and visitors. Toilet paper must be disposed of in the toilet and not on the floor. Urinating, defecating or spitting is not permitted in any growing areas
- 3) Workers and visitors showing signs of illness will be restricted from the production grove. Workers should report to their supervisor immediately if they have the following symptoms, fever, diarrhea, vomiting or symptoms of other infectious diseases.
- 4) Workers and visitors with open sores or lesions must effectively cover the wound or they will be restricted from the production grove. Workers must report to their supervisor for treatment if they injure themselves while working. Special attention will be given if an employee is bleeding, since contacted product must be disposed of.
- 5) First aid kits are readily available for employees and located \_\_\_\_\_ (identify location.)
- 6) Workers will report to work in clean clothes and practice good personal hygiene.
- 7) Hairnets or other hair covering are not necessary for food safety purposes in citrus groves.
- 8) Potable drinking water is available to all employees. Documentation of potability will be retained.

**Grove Sanitation**

1. Structures, equipment and containers used in the grove to contain or contact citrus fruits excepting those identified in the risk assessment as presenting negligible risk of fruit contamination will be cleaned and where appropriate sanitized.



2. Designated storage areas during breaks or visits to the toilet are provided for protective clothing and tools used by employees so that they are not left on the ground or anywhere that may lead to their contamination or contamination of fruit.
3. Employees' personal belongings shall be stored in designated areas so as not to be a source of product contamination.
4. Introduction of foods, eating and drinking is confined to designated personal service areas, except for drinking water which is permitted anywhere in the grove. Eating is permitted in harvested areas. Workers are instructed to remove and properly dispose of any trash or remaining food.
5. Personal service areas will be maintained so as not to be a source of contamination and are located away from produce handling areas. Employees will be informed of the location of designated areas.
6. Fruit that has come in contact with blood must be disposed of. Equipment that has come in contact with blood will be effectively cleaned and sanitized prior to use.
7. Procedures are in place to address spills and leaks (fuel, oil, hydraulic fluid) on production equipment in the field.
8. Light bulbs and glass on production equipment in the grove will be protected so as not to contaminate fruit in case of breakage.
9. Glass containers are not allowed inside the grove, unless they are required for production purposes. If glass breaks in the grove the following procedure will be conducted:
  - a. Work in the immediate vicinity of the breakage will be stopped and broken glass will be thrown away.
  - b. Bins, tools and equipment exposed will be inspected.
  - c. Workers will check themselves, including clothing and shoes for glass fragments, nicks, cuts, and bleeding.

**DOCUMENTATION:**

1. Worker training logs
2. NUOCA log

STANDARD OPERATING PROCEDURE #6.0

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**TOILET FACILITIES AND HAND WASHING STATIONS**

**CONCERN:**

The potential for contamination can increase if toilet facilities and hand wash stations are not used by workers or are not sufficiently maintained for use.

**POLICY:**

- All workers will be instructed to use the toilet facilities and hand washing stations. (See Worker Food Safety Training Guide-*Appendix 2.*) Signage in English, Spanish or other appropriate language will be posted adjacent to washing stations requiring people to wash their hands after each toilet visit.
- Toilet facilities and hand washing stations must comply with all local, state and federal standards. This includes number of facilities and location relative to employees.
- Toilet facilities and hand washing stations will be self-contained so that wash and rinse water does not flow onto the ground.
- Toilet facilities and hand washing stations will be clean, operational, regularly maintained and located in a manner that minimizes potential for contamination of fruit and are accessible for servicing.

**PREVENTATIVE OR CORRECTIVE MEASURES:**

**Field Placement**

- 1) Toilet facilities and hand washing stations will be placed in personal service areas that minimize risk of contamination to the grove and citrus fruit in case of leaks or spills, but are easily accessible for workers.
  - a. There will be a minimum of one facility for each 20 employees.
  - b. Facilities will be within a ¼ mile or 5 minute walk of workers.

**Cleaning & Servicing**

- 1) Cleaning, servicing (pumping) and stocking of supplies will be the responsibility of \_\_\_\_\_ (insert responsible company/person)
  - a. Toilet facilities and hand washing stations will be serviced at least weekly or more frequently as needed.
  - b. The Toilet Facility and Hand Wash Station Log (*See Appendix 5*) will be kept in the toilet facilities/hand washing station to record servicing and cleaning dates.
- 2) If possible, toilet facilities and hand washing stations will not be cleaned and/or serviced near the grove.
  - a. If they must be cleaned and/or serviced near the grove, then appropriate physical barriers or containment practices will be in place in the event of a spill.
- 3) Facilities will be, at all times, well stocked with toilet paper, liquid soap, single use paper towels, and hand washing water that meets microbial standards for drinking water.
  - a. Documentation of source and test results will be on file to show that hand wash water meets microbial standard for drinking water. If a municipal source, the municipal testing will suffice.

**DOCUMENTATION:**

- 1) Toilet Facility and Hand Wash Station Log
- 2) Source and test results of hand wash water.

INSERT COMPANY NAME HERE  
**FOOD SAFETY PLAN**

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STANDARD OPERATING PROCEDURE #7.0

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**ANIMAL ACTIVITY**

**CONCERN:**

Animal feces are potential sources of food-borne pathogens.

**POLICY:**

In order to minimize the potential for contamination, animal assessments and monitoring of the grove and adjacent land will be conducted. Based on the assessments and monitoring, action will be taken to minimize the potential for contamination of fruit or food-contact surfaces and to prevent the harvest of potentially contaminated fruit.

**PREVENTATIVE OR CORRECTIVE MEASURES:**

**Animal Assessment**

- 1) An assessment of the grove and adjacent land will be made at the beginning of each season and documented in Field Assessment – Adjacent Land Use and Animal Activity Sections. *(See Appendix 1)* The assessment focuses on the impact of domestic, livestock and wild animal activity for potential pathogen contamination of the grove and fruit. It will include the extent of animal intrusion, type and approximate number of animals, nearness to the grove and water sources and proximity to harvest date. Primary attention will be directed to animals known to be potential sources of food-borne illness such as pigs, deer, cattle and sheep.
  - a. Necessary preventative measures put into place or already in place to exclude animals or minimize intrusion will be documented. Measures may include fence repair, traps, deterrents, redirecting of wildlife, disposal of animal carcasses, removal of feces, etc.
  - b. When the assessment indicates a possibility of contamination with pathogens, action will be taken to minimize the potential for contamination of the fruit and to prevent the harvest of any potentially contaminated fruit.

**Animal Monitoring**

- 1) Monitoring of the grove and adjacent land for evidence of animal activity will be conducted \_\_\_\_\_ (insert monitoring frequency) and records maintained. Monitoring will be recorded on the Animal Monitoring Log. *(See Appendix 5)*
  - a. When monitoring indicates possibility of contamination with pathogens, action will be taken to minimize the potential for contamination of the fruit and to prevent the harvest of any potentially contaminated fruit.
- 2) Any bins that have evidence of animal contamination will be returned to packers.

**DOCUMENTATION:**

- 1) Field Assessment – Adjacent Land Use and Animal Activity Sections
- 2) Animal Monitoring Log
- 3) NUOCA log

**FOOD SAFETY PLAN**

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STANDARD OPERATING PROCEDURE #8.0

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**PRE-HARVEST EVALUATION**

**CONCERN:**

The harvest of contaminated fruit can increase the potential of food-borne illness to the consumer.

**POLICY:**

1. Prior to harvest, an evaluation of the grove environment shall be performed and documented for changes that may be likely to result in contamination of citrus fruit.
2. To the extent possible, action will be taken to prevent the harvest of fruit that is likely to be contaminated.

**PREVENTATIVE OR CORRECTIVE MEASURES:**

1. The evaluation will be conducted no more than 7 (or enter maximum number of days) days prior to harvest and will be recorded on the Pre-harvest Evaluation log. *(See Appendix 5)*
2. The evaluation will include inspection for:
  - a. Evidence of animal intrusion such as downed fences, presence of live or dead animals, animal tracks or feces. If animal intrusion is detected, measures shall be taken to remove or prevent from harvest any potentially contaminated product.
  - b. Presence of potentially contaminating materials (e.g. non-composted manure, etc.) likely to pose a contamination risk to the grove to be harvested.
  - c. Evidence that the irrigation water source and delivery system may potentially be compromised.
  - d. Any other contamination risks present such as contaminated run-off from animal operations, evidence that field workers have not complied with employee hygiene rules, evidenced of flooding, leaking equipment, toilet facilities, etc.
3. When the evaluation indicates potential for contamination of fruit, corrective actions must be taken prior to harvest.
4. Harvest contractors are required to train workers and follow GAPs for citrus harvesting.

**DOCUMENTATION:**

1. Pre-harvest Evaluation log

INSERT COMPANY NAME HERE  
**FOOD SAFETY PLAN**

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STANDARD OPERATING PROCEDURE #9.0

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**PESTICIDE USE**

**CONCERN:**

To prevent product contamination from pesticide use that doesn't comply with federal, state or local laws and regulations.

**POLICY:**

Pesticide usage will comply with all federal, state, and local laws and regulations and will be applied in accordance with the label instructions.

**PREVENTATIVE OR CORRECTIVE MEASURES:**

- 1) Pesticide use reports and PCA recommendations are kept on file. Use records will be available to the packer upon request.
- 2) Pesticides will be stored in a manner and location to prevent contamination of fruit, equipment and water sources. Pesticides will be stored in a locked area.
- 3) Records are kept on file demonstrating that all personnel responsible for pesticide applications are trained and/or licensed, or supervised by licensed personnel in compliance with prevailing regulations
- 4) Procedures are developed for disposal of waste agricultural chemicals and cleaning of application equipment that protects against contamination of product and growing areas.
- 5) Spray equipment will be properly calibrated \_\_\_\_\_ (indicate frequency) and documents of calibration maintained.
- 6) Residue testing will be conducted on fruit prior to harvest if there is an indication that the product may be out of compliance for MRLs.

**DOCUMENTATION:**

- 1) Pesticide use reports
- 2) PCA recommendations
- 3) Applicator license or training records
- 4) Chemical disposal procedures
- 5) Application equipment cleaning records
- 6) Pesticide residue test results (if necessary)
- 7) Sprayer calibration records

**FOOD SAFETY PLAN**

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STANDARD OPERATING PROCEDURE #10.0

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**TRACEABILITY**

**CONCERN:**

If product contamination is discovered or in the event of a product recall, product must be clearly and quickly traced back to the origin and traced one step forward to all recipients.

**POLICY:**

- In the event that product contamination is discovered or of a product recall in the marketplace, all recipients of the fruit (except for direct to consumer sales) will be identified and all appropriate records made available.
- If we are contacted by a regulatory agency such as FDA, California Department of Health Services or a county Department of Health in regards to the safety of harvested fruit, or if we become aware of any factors that might impact safety of fruit harvested, the shipper having received the fruit from the block in question will be contacted immediately. The shipper will be consulted prior to any decision to conduct a product recall.

**PREVENTATIVE OR CORRECTIVE MEASURES:**

- 1) At harvest, records of harvest dates, harvest crews, quantities harvested, subsequent destination of fruit and transporter will be maintained and quickly retrievable. Outgoing loads will be identified at a minimum with grower block, harvest date and harvest crew.
- 2) Records will be maintained using the same source identification (grove/block ID) used by the packer.
- 3) Adequate records of cultural practices, including input sources, methods, and timing used in the grove will be maintained for at least two years and will be readily retrievable.

**DOCUMENTATION:**

- 1) Records of all production inputs
- 2) All Food Safety & Pesticide Use Records
- 3) Harvest Records

INSERT COMPANY NAME HERE

**FOOD SAFETY PLAN**

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STANDARD OPERATING PROCEDURE #11.0

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**LABOR CONTRACTORS**

**CONCERN:**

Ensuring food safety practices are followed by labor contractors when working in company groves.

**POLICY:**

- 1) Harvesting contractors will follow the practices of the *GAPs for California Citrus Harvesting*.
- 2) All labor contractors and their employees will be required to abide by our company food safety policies and practices when working in company groves.

**DOCUMENTATION:**

- 1) All documentation will be kept on file by the contractor. Documentation will be available upon request.



INSERT COMPANY NAME HERE  
**FOOD SAFETY PLAN**

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STANDARD OPERATING PROCEDURE #12.0

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**SELF AUDITS**

**PURPOSE:**

Self-audits are a useful means to ensure that food safety procedures are being followed and records properly maintained.

**PROCEDURES:**

1. Self-audits will be conducted annually by the individual responsible for food safety.
2. All aspects of the operation's food safety plan will be audited using \_\_\_\_\_ (indicate audit checklist used.)

**PREVENTATIVE OR CORRECTIVE MEASURES:**

- Corrective measures will be taken to address deficiencies found in the self-audit. These will be recorded on the audit check list.

**DOCUMENTATION:**

1. Audit checklist with corrective actions
2. NUOCA log

## APPENDIX 1

### FIELD ASSESSMENT

Grove/Ranch name:		Business or Grower Name:	
Date of assessment:		Total acres:	
Site location: GPS coordinates (optional)			
Person performing assessment:			
Person responsible for food safety at this location (if different than above):			

<b>Property Overview (check all that apply and include on site map)</b>					
<input type="checkbox"/> Crop production	<input type="checkbox"/> Animal production (Describe)	<input type="checkbox"/> Permanent or temporary structures on site (homes, barns, etc.)			
<b>Other Crop(s) grown on this property</b>					
<b>Crop(s)</b>				<b>Acres under cultivation</b>	
1)					
2)					
3)					
Possible Risks	Risk Assessment	Potential contaminants: Biological/ Chemical/ Physical			Verification/Supporting Documentation
		B	C	P	
Contamination from structures or animal production on the property	Preventative and corrective measures are in place, including buffer zones, fencing, structure maintenance and repair. Fields are assessed at the beginning of the season and prior to harvest for food safety risks.	X		X	1. Field Risk Assessment 2. Pre-Harvest Inspection

<b>Previous Land Use History (New Plantings Only)</b>					
Possible Risks	Risk Assessment	B	C	P	Verification/Supporting Documentation
Soil contaminants	All lands used for citrus production have been in tree crop production for at least the last 5 years.	X	X		1. Land history statement

<b>Flooding History</b>					
Has any part of the citrus grove(s) recently been affected by a significant flood event? <input type="checkbox"/> Yes <input type="checkbox"/> No					
Possible Risks	Risk Assessment	B	C	P	Verification/Supporting Documentation
Flood waters contacting product	After a significant flood event, a documented evaluation will be conducted and kept on file. Fruit that is submerged in flood water will be excluded from harvest for human consumption.	X			1. When applicable, flood event evaluation.

Adjacent Land Use (check all that apply and include on map)					
<input type="checkbox"/> Crop production	<input type="checkbox"/> Residential	<input type="checkbox"/> Grazing/Pasture Land	<input type="checkbox"/> Fallow Land		
<input type="checkbox"/> Concentrated Animal Feeding Operation	<input type="checkbox"/> Manure dumping, storage, or handling	<input type="checkbox"/> Watershed (river, stream, pond, lake)	<input type="checkbox"/> Commercial or industrial development		
<input type="checkbox"/> Other, Describe:					
Possible Risks	Risk Assessment	B	C	P	Verification/Supporting Documentation
Contamination from domestic animals, wildlife, water, manure storage, composting or waste storage operations	Preventative and corrective measures are in place, including buffer zones, fencing, ditches, and documented animal monitoring. Fields are assessed at the beginning of the season and prior to harvest for food safety risks.	X	X		1. Field Risk Assessment 2. Pre-Harvest Inspection

Animal Activity					
Describe general animal pressure on the Grove/Ranch over the previous year (i.e. types, amounts and frequency of domestic and wildlife observed in and around the grove):					
Possible Risks	Risk Assessment	B	C	P	Verification/Supporting Documentation
Contamination from animals of potential significance: Cattle, sheep, pigs, deer	Preventative/mitigation measures are in place including fencing, deterrents, skirting trees, removal of feces before harvest, disposing of animal carcasses, chasing off animals when seen on the property, etc. Routine Animal Monitoring is conducted per SOPs. Prior to harvest the grove is inspected for evidence of livestock or wildlife intrusion.	X			1. Field Risk Assessment 2. Animal Monitoring Log 3. Pre-Harvest Inspection

Water Use and Source (check for each type of use, include sources on map)					
Use	Municipal	Well/Closed System	Surface water (canal, reservoir)	Not Applicable	
Hand Washing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Equipment cleaning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Irrigation Method: <input type="checkbox"/> Micro Jet Sprinkler <input type="checkbox"/> Drip <input type="checkbox"/> Furrow <input type="checkbox"/> Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fertilizer/Pesticide/Fungicide Application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Water tests and assessments have been conducted on each source at the required frequency? <input type="checkbox"/> Yes <input type="checkbox"/> No					
Possible Risks	Risk Assessment	B	C	P	Verification/Supporting Documentation
Water contaminated through the source or distribution system contacting fruit	Water coming in contact with fruit is sampled annually. Reclaimed water is not used. Surface and well water sources, and distribution systems are assessed annually. When needed corrective actions/preventative measures are implemented and recorded.	X			1. Water Testing Results 2. Well and/or Surface Water Inspection Log 3. Water Distribution System

<b>Soil Amendments / Crop Treatments</b>					
Supplier name and address is being recorded along with the method and date of application? <input type="checkbox"/> Yes <input type="checkbox"/> No					
Soil Amendments containing manure, used at this location (check all that apply)					
<input type="checkbox"/> No manure or municipal biosolids are applied to soil	<input type="checkbox"/> Municipal biosolids are applied to soil	<input type="checkbox"/> Manure is applied to soil	<input type="checkbox"/> Composted manure is applied to soil		
Crop Treatments (containing animal products) used at this location					
<input type="checkbox"/> No crop treatments containing animal products are applied to the crop	<input type="checkbox"/> Crop treatments containing animal products are applied to the crop				
Animal Manure & Products storage (check all that apply)					
<input type="checkbox"/> No municipal biosolids, animal manure, and/or crop treatments are stored on the premises	<input type="checkbox"/> Municipal biosolids are stored on the premises	<input type="checkbox"/> Manure is stored on the premises	<input type="checkbox"/> Composted manure and/or crop treatments (containing animal products) are stored on the premises		
Possible Risks	Risk Assessment	B	C	P	Verification/Supporting Documentation
Contaminated animal manure and by products contacting fruit through application or storage.	Materials are sourced from reputable vendor, a letter of guarantee and/or certificate of analysis is on file. Materials are stored and applied in a manner that prevents contact with fruit and trees are skirted. Established pre-harvest application interval.	X			<ol style="list-style-type: none"> <li>1. Letters of Guarantee or Certificate of Analysis</li> <li>2. Soil Amendment/Crop Treatment Application Log</li> <li>3. Self-audits</li> </ol>

<b>Pesticides</b>					
Possible Risks	Risk Assessment	B	C	P	Verification/Supporting Documentation
Contamination from improper application (misuse of chemicals, contaminated equipment, etc.)	Materials are regulated by local, state and federal laws and regulations. Applications made by licensed or trained applicators and follow label instructions. Sprayer equipment is calibrated and cleaned. SOPs for pesticide storage. Residue testing as needed per SOPs.	X	X		<ol style="list-style-type: none"> <li>1. Pesticide use reports and PCA recommendations.</li> <li>2. Applicator license or training records</li> <li>3. Sprayer calibration records</li> <li>4. Pesticide residue test results (when applicable)</li> <li>5. Water testing results</li> </ol>

<b>Sewage Systems (check all that apply and include on map)</b>					
<input type="checkbox"/> Municipal	<input type="checkbox"/> Septic System	<input type="checkbox"/> Portable containment system		<input type="checkbox"/> None on site	
Possible Risks	Risk Assessment	B	C	P	Verification/Supporting Documentation
Contamination from improperly maintained sewage systems	The system is evaluated annually to verify it's maintained in a manner to prevent contamination of the grove and fruit, and is in compliance with local laws and regulations	X			1. When applicable, sewage system evaluation

<b>Toilet and Hand Wash Facilities (check all that apply)</b>
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<input type="checkbox"/> Permanent facilities	<input type="checkbox"/> Portable units	<input type="checkbox"/> None on site (brought on with workers)			
<b>Cleaning and Maintenance of Toilet Facilities</b>					
<input type="checkbox"/> Performed by grower		<input type="checkbox"/> Contracted service		<input type="checkbox"/> Not Applicable	
Possible Risks	Risk Assessment	B	C	P	Verification/Supporting Documentation
Contamination of soil and fruit from facilities due to location, waste containment issues and cleaning.	Facilities comply with all local, state and federal standards. SOPs in place for proper location, servicing and stocking with needed supplies.	X			1. Toilet Facility and Hand Wash Station Log  2. Self-audits  3. Hand Washing Water Analysis (microbial potable standards only)

<b>Worker Health &amp; Hygiene</b>					
Labor is hired by (check all that apply): <input type="checkbox"/> Grower/Farming Company <input type="checkbox"/> Labor Contractor <input type="checkbox"/> Other					
Possible Risks	Risk Assessment	B	C	P	Verification/Supporting Documentation
Workers contaminating fruit or the grove due to poor health and hygiene practices	Workers are trained in health and hygiene practices. Glass SOPs. SOPs in place that identify appropriate practices. Labor contractors are required to follow SOPs.	X		X	1. Worker Training Logs  2. Self-audits

<b>Grove Sanitation</b>					
Possible Risks	Risk Assessment	B	C	P	Verification/Supporting Documentation
Contamination of soil and fruit from equipment, foreign materials and workers.	Harvest equipment that contact fruit (bins, clippers, picking sacks, ladders) are cleaned and sanitized per SOPs. Other equipment used in farming and transportation to packinghouse is considered of negligible risk due to only incidental fruit contact. SOPs in place to address spills and leaks, workers personal belongings, eating and drinking, trash removal, Glass SOPs. Blood and other bodily fluids SOPs.	X	X	X	1. List of food contact equipment  2. Equipment cleaning and maintenance Logs  3. Worker Training Logs  4. Self-audits

<b>Harvesting/ Other contracted labor</b>					
Harvesting labor is arranged/hired by (check all that apply): <input type="checkbox"/> Packer <input type="checkbox"/> Grower/Farming Company <input type="checkbox"/> Other					
Possible Risks	Risk Assessment	B	C	P	Verification/Supporting Documentation

Harvesting Workers should follow GAPs when working in the grove	Harvesting and other contractors will follow the practices of the <i>GAPs for California Citrus Harvesting</i> .	X	X	X	1. Labor Contractors or Packer will maintain and have available all harvest records.
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**Grove/Ranch Map (or attach copy of map)**  
 include production areas, adjacent land uses, water sources and any permanent water distribution systems. Other items to possibly include: permanent toilet facilities, sewer/septic systems, barns or other animal housing, manure storage sites.











