

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

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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.