

**CALIFORNIA CITRUS HARVESTING
GOOD AGRICULTURAL PRACTICES
(GAP)**

October 26, 2010

Table of Contents

Harvest and In-Field Handling Requirements

Pre-Harvest	3
Harvesting Equipment	3
Harvested Crops.....	4
Personal Health & Hygiene.....	4
Grove Sanitation.....	5
Training	5
Visitors	6
Sanitary Facilities	6
Transportation from the Field	6
Appendices	7

FOOD SAFETY - HARVEST AND IN FIELD HANDLING REQUIREMENTS

While it is ultimately the grower's responsibility to ensure that citrus fruit is produced using sound microbiological risk reduction practices, it is common for growers or packers to contract harvesting activities to firms that specialize in harvest activities. This document contains recommendations that harvesters can use to ensure that fruit is harvested and shipped to minimize the risk of microbiological contamination.

All of the recommendations in this section are contained in the primary document. This section may be duplicated and shared with harvest contractors, so harvest activities are handled adequately by contractors.

Pre-Harvest

- Prior to harvest, the grower or designated representative should perform a documented evaluation (see appendix 7) 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 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. manure, etc.) in such manner as to pose a likely contamination risk to the grove to be harvested.
 - Evidence that the irrigation water source and delivery system may potentially be compromised.
 - Evidence that field workers have not complied with employee hygiene rules as outlined in the company food safety plan.
 - Any other potential contamination risks present (e.g. contaminated run off from animal operation, leaking equipment or bathrooms etc.)

Harvesting Equipment

- Harvesting containers and equipment should be stored in a manner to avoid contamination with pathogens. Avoid storing under areas where birds may perch. Areas should be clean, free of pests and of trash that may attract animals.
- The grower should have a policy in place to ensure that gloves are used properly and do not become a source of contamination. Gloves and sleeve guards should be inspected frequently for wear and potential for contamination and should be replaced weekly or when they become worn or contaminated.
- Picking sacks, clippers, and personal protective equipment should be inspected before each use and replaced if any sign of potential contamination is present.

- When not in use, gloves and clippers should be placed in picking sacks to avoid contamination. They should not be placed on the ground or taken into toilet facilities or stored in a manner that may lead to contamination.
- Trained personnel should inspect all equipment to ensure that it is functioning properly and that all fruit contact surfaces such as bins, gloves, picking sacks and clippers are clean and sanitary prior to use so as not to become a source of contamination. Picking sacks, clippers, and personal protective equipment should be replaced or cleaned if any sign of potential contamination is present.
- Bins
 - Bins that are used for harvested fruit should not be used for any other operation such as garbage, storage of water bottles, food items or any equipment.
 - Workers should be instructed not to stand in bins.
 - Documentation of bin cleaning between uses should be made. Cleaning procedures should be documented.
- Picking Bags, clippers and ladders
 - Picking Bags, clippers and ladders should be cleaned routinely and as needed. Cleaning procedures and frequency should be documented. See Appendix 6.
 - Harvest clippers and other hand tools should be sanitized weekly or as needed such as with a chlorine solution of 100-200 ppm (total chlorine).
 - Picking sacks should be washed at least weekly or as needed.
 - Ladders should be cleaned as needed.
 - During breaks picking sacks, gloves and clippers should be stored in a designated, clean area and off the ground.

Harvested Crops

- The harvester or designated representative should ensure that the fruit is handled from tree to bin to truck in a way that no contamination with pathogens should occur. The harvester or designated representative should make sure that fruit is removed from the orchard as soon after harvest as possible to avoid contamination such as from bird droppings and animals.
- Harvest crews should be trained to recognize and avoid picking citrus that may be contaminated with pathogens (including fruit with bird droppings or any fecal matter, diseased, rotten, punctured or injured fruit) and to never pick up citrus fruit from the ground if to be used for human consumption.

Personal Health and Hygiene

- Workers 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 (e.g., diarrhea, fever, vomiting) should be restricted from the production grove.

- Worker and visitors who have an open sore or lesion must effectively cover it or should be restricted from the production grove.
- Workers should report to work in clean clothes and practice good personal hygiene.

Grove Sanitation

- Other than drinking water, the introduction of foods, feeds, extraneous materials as well as eating, drinking, spitting, chewing gum and using tobacco in groves should be prohibited except in clearly designated 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 product that comes in contact with blood must be disposed of.
- Glass containers should not be brought into groves, unless it is needed for production purposes.
- 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.

Training

- The harvester (harvest contractor) should ensure training is provided and documented for all harvest workers on proper sanitation and hygiene practices and on job responsibilities that impact food safety. Documentation should include topics covered, date and names of those in attendance. Harvest workers should be trained upon hire and monthly.
- 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 and to avoid picking citrus that may be contaminated with pathogens (including fruit with bird droppings or any fecal matter, diseased, rotten, punctured or injured fruit)
 - never pick up citrus fruit from the ground if to be used for human consumption
 - 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

Visitors

- Growers or designated representative shall ensure that all visitors comply with all established grove sanitation and personal health and hygiene practices.

Sanitary Facilities

- The following should be constantly maintained for all toilet facilities and hand washing stations:
 - 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 not be located within the production area. They should be placed in an area that minimizes risk for field and citrus fruit contamination, but is also an easily accessible location for field workers.
 - There should be a minimum of 1 toilet facility for every 20 people and separate facilities for men and women if there are more than five workers.
 - Facilities shall be located within a 5 minute walk or ¼ mile of workers.

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.

Transportation from the Field

- All personnel including drivers involved in the loading and unloading of the fruit should follow the worker health and hygiene practices described above.
- Vehicles should have cleaned cargo areas so as to minimize the contamination of the fruit with pathogens. Any cargo areas or containers that have been used to transport trash, animals, raw animal products or other items should not be used to transport fruit unless they have been fully cleaned and sanitized in a manner to ensure that no contamination of the fruit can occur.
- The personnel responsible for the loading and unloading of the fruit should take steps to minimize physical damage to the fruit that could increase risk of contamination with pathogens.

APPENDIX 1

**LIST OF NEEDED DOCUMENTATION AND SAMPLE LOGS
LOGS FOR WORKER TRAINING, EQUIPMENT CLEANING, HARVEST CREW
INSPECTION,
INJURY REPORTING AND TRUCK INSPECTION**

Worker Training Log
Field Sanitation Unit Cleaning & Pumping Log
Harvest Tool Cleaning Log
Harvest Crew Daily Pre-Op Inspection
Illness/Injury Reporting Log
Truck Inspection Log

Worker Training Log

Name of Operation: _____

Date: _____

Trainer: _____

Training Time: _____

Crew ID/Number: _____

Location: _____

Training Topic(s): _____

Attach any written training materials to this log with a staple

Employee Name (please print)	Employee Signature
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____
9. _____	_____
10. _____	_____
11. _____	_____
12. _____	_____
13. _____	_____
14. _____	_____
15. _____	_____
16. _____	_____

Reviewed by: _____

Title: _____

Date: _____

Field Sanitation Unit Cleaning & Pumping Log

Name of Operation: _____

Please see the food safety plan for overall information on field sanitation unit service procedures.

Sanitation Unit #	Date of Cleaning	Cleaned By (name)	Date of Pumping	Pumped By (name)	Supplies Stocked*
					<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No

* Sanitation supplies are single use towels, trash can, toilet paper, soap, potable water for hand washing.

If contracted with a sanitation company, attach service/cleaning receipt.

Reviewed by: _____

Title: _____

Date: _____

Harvest Tool Cleaning Log

Name of Operation: _____

Please see the food safety plan for overall information on harvest tool cleaning procedures.

Date	Tool(s)	Cleaned	Sanitized	Cleaner/Sanitizer Used	Sanitizer Levels (if used)		Completed By
					ppm:	pH:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		ppm:	pH:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		ppm:	pH:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		ppm:	pH:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		ppm:	pH:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		ppm:	pH:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		ppm:	pH:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		ppm:	pH:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		ppm:	pH:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		ppm:	pH:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		ppm:	pH:	

Reviewed by: _____

Title: _____

Date: _____

Harvest Crew Daily Pre-Op Inspection

Name of Operation: _____

Crew ID: _____

Week: _____

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
<i>Name or ID of Grove Harvested</i>							
1. Harvesting area is free of any evidence of contamination or animal intrusion.	<input type="checkbox"/> Yes <input type="checkbox"/> No						
2. Toilet and hand washing facilities are clean, have necessary supplies and are placed outside of the harvest area	<input type="checkbox"/> Yes <input type="checkbox"/> No						
3. Employees are trained and following food safety policies and procedures (hand washing, eating, using restroom, etc.)	<input type="checkbox"/> Yes <input type="checkbox"/> No						
4. Employees are healthy and have any cuts, sores or open wounds covered appropriately.	<input type="checkbox"/> Yes <input type="checkbox"/> No						
5. Employees are inspecting bins for cleanliness before filling.	<input type="checkbox"/> Yes <input type="checkbox"/> No						
6. Harvesting tools and equipment is clean and handled properly.	<input type="checkbox"/> Yes <input type="checkbox"/> No						
7. If clippers are sanitized, sanitizer concentration and ppm level	ppm						
Inspection Completed By							

If any question is marked No, complete and document corrective actions below

CORRECTIVE ACTIONS

Problem (describe and include date of occurrence)	Corrective Action Taken	Date Completed	Completed By

Reviewed by: _____

Title: _____

Date: _____

Illness/Injury Reporting Log

Name of Operation: _____

Please see the food safety plan for overall illness/injury reporting procedures.

Date	Name of Employee	Injury sustained/ Illness reported	Action taken (ice applied, bandaged, sent to hospital, etc.)	Did employee return to work?	Reported By
				<input type="checkbox"/> Yes <input type="checkbox"/> No	
				<input type="checkbox"/> Yes <input type="checkbox"/> No	
				<input type="checkbox"/> Yes <input type="checkbox"/> No	
				<input type="checkbox"/> Yes <input type="checkbox"/> No	
				<input type="checkbox"/> Yes <input type="checkbox"/> No	
				<input type="checkbox"/> Yes <input type="checkbox"/> No	
				<input type="checkbox"/> Yes <input type="checkbox"/> No	

Reviewed by: _____

Title: _____

Date: _____

Truck Inspection Log

Name of Operation: _____

Please see the food safety plan for truck inspection procedures.

Date	Trucking Company	Truck Clean	If no, state the problem (off odor, debris, etc.)	Corrective Action	Inspected By
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			

Reviewed by: _____

Title: _____

Date: _____

APPENDIX 2

EXAMPLE: FIELD SANITATION AND EMPLOYEE HYGIENE TRAINING¹

A. Employee Hygiene

1. All persons working with grower's produce, food-contact surfaces, and packaging materials shall comply with hygiene practices while on duty to the extent necessary to protect the product against contamination.
2. All persons shall wash hands thoroughly in an adequate hand washing facility to protect against undesirable microorganisms. Hands must be washed prior to starting work, after using the restroom, and after eating, or smoking.
 - a. Wash hands properly from elbow to hand, interior, palm, and back of the hand and in between fingers.
 - b. Use clean and fresh potable water to wash hands.
 - c. Use soap with antibacterial properties to remove microbes from the hands.
 - d. Hand sanitizer may not be used as a substitute for hand washing.
3. Employees with long hair will maintain the hair tied back to avoid possible contact with the produce.
4. No employee known to be a carrier or exhibiting symptoms of an infectious disease (nausea, diarrhea, fever, etc.) will be allowed to harvest produce or to work in close proximity to the fruit.
5. Any rashes, open cuts, or open sores on the hands must be covered with a sanitary dressing. If wound is not stopped from bleeding, the employee is advised to inform the supervisor.
6. Any product that comes in contact with blood or any other bodily fluid must be immediately discarded and disposed of properly. Additionally, any equipment surface that comes in contact with blood or other bodily fluid must be properly cleaned. All necessary actions should be taken to prevent further contamination.
7. Products that have fallen on the ground shall not be used.
8. Domestic animals, such as dogs, cats, etc., are not allowed in the growing area.
9. Employees are not permitted to eat, drink (other than water), or smoke in actively harvested areas or on harvesting/packing machinery.
10. For safety reasons, children should not be present in growing fields during labor activities.
11. All persons shall wear outer garments suitable to the operation in a manner that protects against the contamination of food.
 - a. Avoid loose clothing that might come into contact with the produce while performing the job duties.
 - b. Avoid wearing dirty clothing that may contaminate the fruit.
12. All persons must remove all unsecured jewelry and other objects that might fall into the product or equipment and cause potential contamination.
13. All visitors to the growing areas are expected to adhere to grower's Food Safety Policies and to follow proper sanitation and hygiene practices at all times.

¹ This section draws heavily from PrimusLabs.com documents.

B. Sanitary Practices

1. Adequate and properly stocked toilet and hand washing facilities must be provided for all employees handling grower's product at all times during work hours.
 - a. Toilet and hand washing facilities will be built of a material that allows for proper cleaning, designed for proper ventilation, and constructed to ensure privacy (interior locking device).
 - b. Toilet and hand washing facilities shall be located within reasonable proximity (1/4 of a mile) and accessible to all field workers handling the grower's product.
 - c. Sanitary facilities will be equipped with clean and fresh potable water, antibacterial soap, toilet paper, and single-use towels.
2. Employees must use the toilet facilities provided by the company. NEVER urinate or defecate anywhere except in toilet facilities. Used toilet paper must be disposed of in the toilet. DO NOT dispose of toilet paper in the trash can or on the floor.
3. All field workers must wash their hands with potable water and soap prior to beginning work, before and after breaks, and before leaving the field.
4. All field workers must wash their hands after every toilet use.
 - a. Potable water (hot, when available) must be used for hand washing.
 - b. Antibacterial soap must be used when washing hands.
 - c. Hands will be dried with single-use towels. Towels will be disposed of immediately.
5. Eating, chewing gum, drinking beverages, and the use of tobacco products will be confined to break areas where fruit, equipment, and utensils are not exposed to possible contamination.
6. Keep all glass objects outside of the grove.

C. Equipment Sanitation

1. All bins must be clean and free from contamination. Never stand in bins. Do not place personal items, lunches, water bottles or glass objects inside bins. Never place fruit into a bin that shows signs of contamination.
2. Harvesting equipment (clippers, bags, gloves, ladders, etc.) should be frequently cleaned and disinfected to avoid contamination.
 - a. Clippers and other hand tools should be sanitized weekly with a 100-200 ppm chlorine solution.
 - b. Picking sacks should be washed with a high pressure hose weekly, or more often, if needed.
 - c. Ladders should be cleaned with a high pressure hose, as needed.
 - d. Gloves and protective sleeves should be inspected daily for wear or potential contamination and should be replaced weekly, or when they become worn or contaminated.
3. Always store gloves, clippers, and sacks off the ground, in a designated area when not in use.
4. Glove, clippers and sleeve guards should be stored in picking sacks during breaks.