

## WORKER SAFETY AND SANITARY OPERATING PROCEDURES

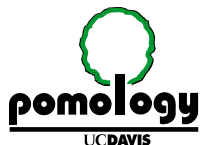
- 1) Maintain clean and sanitary toilet facilities for workers in close proximity (within 1/4 mile or 5 minutes) to work site.
- 2) Review written procedures with workers regarding the use of toilet facilities, hand washing and personal hygiene.

## Industry Reputation

The California walnut industry has a world-wide reputation for producing quality walnuts. We can maintain and expand our markets by ensuring that the products we produce maintain quality, reliability and safety. Each grower can help to protect our reputation for product quality by doing their part to assure the safety of California's walnuts.

## University of California and the Walnut Marketing Board

Prepared by Bruce Lampinen (UC Davis Dept. of Pomology) in cooperation with the California Walnut Marketing Board



## University of California and the Walnut Marketing Board

# Producing Quality Walnuts: Food Safety Starts on the Farm

Walnut growers can minimize the potential for foodborne illness outbreaks resulting from crop contamination by following good agricultural practices. Bacteria that cause foodborne illnesses such as *Salmonella* and *E. coli* O157:H7 can be found in animal and human feces. Potential for contamination of walnuts with these organisms is highest



during harvest when the nuts are dropped to the ground. This brochure highlights procedures that can be applied to minimize potential for on-farm contamination of walnuts.

# Producing quality walnuts: Food safety starts on the farm

## IRRIGATION AND WATER QUALITY CONSIDERATIONS

- 1) Trace your source of water for irrigation and recognize that water may need to be tested and treated for pathogens prior to use.
- 2) Inspect your water delivery system for potential sources of pathogens. Be aware that shared irrigation pipelines could be a source of contaminated water.
- 3) Be sure that water used for foliar applications is tested and treated as well.
- 4) Watch for potential water contamination from adjacent land (e.g. nearby landfills, septic tanks, leach fields, dairy operations, etc.).
- 5) Recycled water (e.g. tertiary treated water) has been used in California for agricultural and landscape irrigation for many years without incident. However, if you use recycled water, obtain, review and maintain copies of monthly reports available from the treatment facility. In particular, look for data on *E. coli* concentration since this serves as an indicator of fecal contamination. Minimize the chance of recycled water coming into contact with nuts. For example, use drip irrigation and maintain the system properly to minimize puddling due to leaks and/or breaks.
- 6) If water sources are contaminated, possible mitigation measures include filtration or chlorination of the water source.
- 7) Be sure crop water needs are being adequately met without over-irrigating by scheduling your irrigation using plant, soil or evapotranspiration based data.

## NUTRIENT APPLICATION

- If you use manure, do so with food safety in mind. The improper use of manure is a potential contributory risk factor for foodborne illness causing organisms. The highest risk is for crops where the edible portion of the crop touches the ground. This can potentially occur at harvest in walnuts

To minimize potential hazards:

- 1) Do not apply biosolids and/or sewage sludge at any time.
- 2) Do not apply raw or inadequately composted poultry/dairy manure or lagoon waste water to the orchard floor during the growing season.
- 3) If manure is used, composted manure products that have undergone pathogen reduction are preferable. Ask the compost producer for and maintain records on:
  - a) The percentage and physical make-up of composted material
  - b) Documentation showing that:
    - i. Compost temperature has reached 131°F for fifteen days or longer
    - ii. Compost windrows were turned a minimum of 5 times during the composting process
    - iii. Microbial test results showing *E.coli*<1,000 MPN/gram of dry solids and *Samonella*<3 MPN/4 grams of dry solids (MPN=most probable number)
- 4) If raw manure is used, apply as early after harvest as possible and disc thoroughly into the top layer of soil.

## VERTEBRATE PEST MANAGEMENT

Minimize the chance of contamination by bird, squirrel, or coyote fecal material by maintaining an active vertebrate pest management program in your orchard. As much as possible, exclude domestic and wild animals from orchards. Clean orchard floor of any undesirable residue before starting harvest. Exclude all animals, especially rodents and birds from all hulling facilities.

## HARVEST

- 1) Check that harvesting and hulling equipment is clean and in good repair. High pressure wash and sanitize all equipment prior to harvest.
- 2) As much as possible, avoid wet soil surface when nuts are shaken and wind-rowed for harvest.
- 3) Minimize the amount of soil that is picked up during the harvest operation by proper adjustment of the harvester.

## FURTHER INFORMATION

For further information on good agricultural practices regarding food safety, see the University of California Good Agricultural Practices Web Site at <http://ucgaps.ucdavis.edu>.