



COMMUNITY

4-H & YOUTH

ENVIRONMENT

AGRICULTURE

FOOD

# Rinsing and Packing

## Rinsing & Packing Produce with Produce Safety in Mind

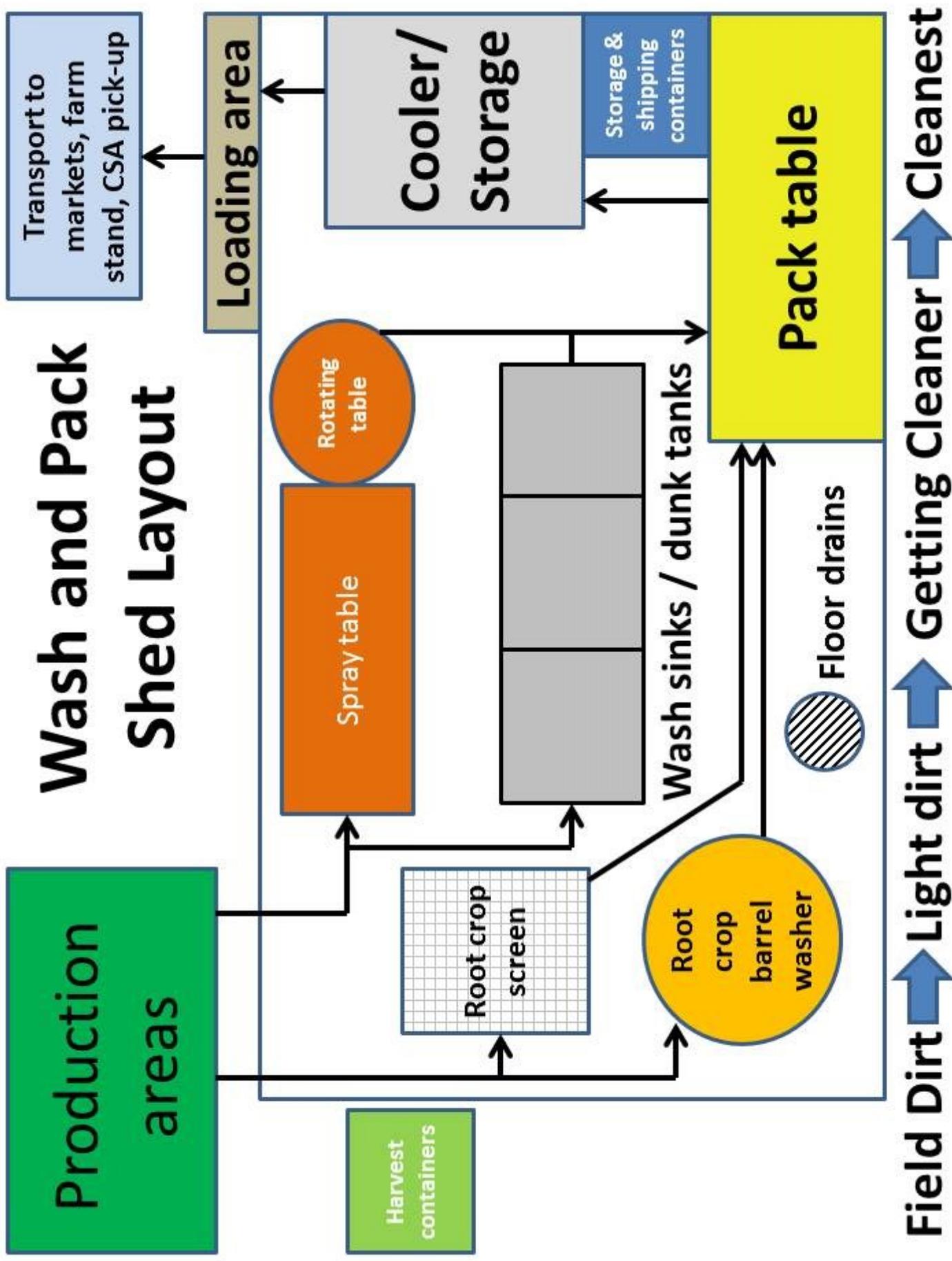
Good hygiene and cleaning practices in the wash and pack shed can improve produce quality and safety, and extend shelf life. Careful layout of rinse and pack sheds can reduce the risk of cross-contamination of produce and increase worker efficiency by cutting down on wasted motion and improving ergonomics.

### Pack Shed Design, Flow and Maintenance

- As much as possible, design your pack shed so that flow is in one direction. Any steps that double back from post-wash to pre-wash areas introduce the possibility for cross-contamination (see Rinse and Pack Shed Layout diagram on reverse).
- If rinsing both fruits and vegetables and animal products (e.g., eggs) in the same space, rinse the produce first. Clean and/or disinfect contact surfaces after animal products have gone through and before produce is packed.
- Make sure run-off from fields, livestock areas, and compost/manure storage does not drain into areas where produce is rinsed, packed, stored, or sold.
- Take efforts to exclude birds, rodents, insects, livestock, and domestic and wild animals from the pack area as much as possible. For controlling birds see: <http://pubs.cas.psu.edu/freepubs/pdfs/uh126.pdf>
- Use food-grade oils and lubricants on pack shed equipment. See <http://renewablelube.com/>
- Keep transportation vehicles (e.g., gators) out of the pack area. Soil on the wheels can contaminate the floor which can then be transferred to surfaces if harvest containers are left on the floor and then hoisted to a food-contact surface.
- Differentiate storage or shipping containers from harvest containers (for example, use color-coding). Store all containers off the ground (e.g., on pallets) in covered areas where they are protected from bird droppings, rodents, insects, and other potential contaminants.
- All water and ice used for rinsing, cooling and shipping must be potable (drinkable). Test the pack shed water source using the Water Quality Testing Guidelines for Agricultural Water Sources at <http://www.uvm.edu/sustainableagriculture/Documents/gapwaterquality.pdf>



For wash and pack shed ideas and examples, see this five-minute video by Cornell Extension: *Harvest Efficiency: Wash Station Setup*. <http://www.youtube.com/watch?v=yL55vdN6saE>



## Pack Shed Design and Flow (continued)

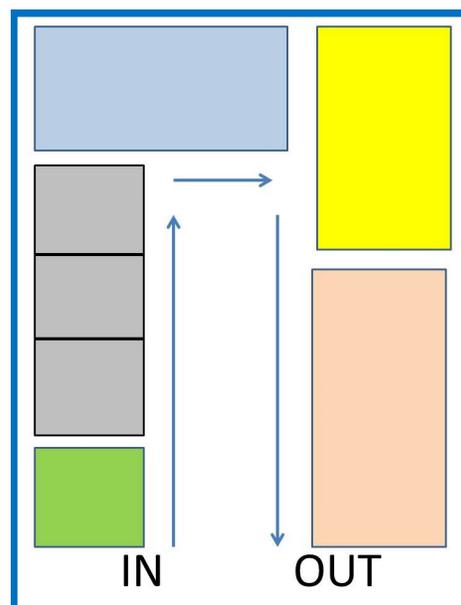
Having a visual of the flow in your pack area may help you identify inefficiencies or safety concerns and explain the process to others (e.g., new employees). When drawing a flow diagram of your pack shed, be sure all major equipment (e.g., sinks, coolers) and steps are represented. Draw arrows to demonstrate the movement or flow through the pack shed. Arrows should generally go from one direction to the other or in an “L”, “J” or “U” shape (see left).

### Rinsing Produce

Water is an excellent vehicle for the transfer of pathogens from one piece of produce to another or from equipment and surfaces to produce. This process is known as cross-contamination.

Triple washing is an effective way of reducing the risk of cross-contamination from wash water. Consider adding a sanitizer to the final rinse to provide extra assurance in preventing cross contamination in case the pathogen load is high. For details of an on-farm study of rinse water quality, see the **Produce Safety Study Report: Effectiveness of Multiple Washings and/or Organic Sanitizer Treatment in Reducing *E. coli* Levels in Wash Water** at <http://www.uvm.edu/vtvegandberry/factsheets/WashWaterStudySummary1-13.pdf>

Rinse water in dunk tanks should be changed when it becomes visibly dirty according to the crop (e.g., less dirty for leafy greens than for winter squash). Check sanitizer levels frequently to make sure they are at the levels stated to be effective on the manufacturer’s label. For a slide show on measuring chlorine and changing out wash water see: [https://cps.ucdavis.edu/amass/documents/document/106/FINAL%20CPS%20Webinar%20Slides%209.21.2012\\_Updated.pdf](https://cps.ucdavis.edu/amass/documents/document/106/FINAL%20CPS%20Webinar%20Slides%209.21.2012_Updated.pdf)



*For some structures, such as those with access on only one side, a “U” shaped flow can be efficient and reduce risk of cross-contamination.*



### An Outbreak Associated with *Listeria* Contamination of Whole Cantaloupe

*Listeria* is a bacterial pathogen that can be found in soil, water, and some animals. Unlike most other bacteria, it can grow at refrigerated temperatures. *Listeria* can survive and grow in food processing areas, drains, and equipment, and has been implicated in numerous food recalls and outbreaks. Although most often associated with ready-to-eat meat and dairy products, in 2011 cantaloupes were the source for an outbreak affecting 147 people and causing 33 deaths and one miscarriage. [Source: CDC]. On the farm in question, *Listeria* was isolated from cantaloupes in cold storage and numerous areas within the packing facility. Factors potentially associated with the outbreak were: pooling of water on the pack shed floor, surfaces and trench drains that were not easily cleanable, used equipment that had previously been used for potatoes and was not easily cleanable, a truck used to haul culls to a cattle farm, and poor post-harvest practices including a lack of pre-cooling before putting the cantaloupe in cold storage. This outbreak underscores the importance of minimizing the introduction of contaminants into processing areas, and routine cleaning and disinfection procedures of equipment and storage areas. [Source: FDA]

## Cooling Produce

When cooling tomatoes, peppers, apples, potatoes, eggplants, and cantaloupes in a water bath, the water should not be more than 10 degrees cooler than the inside temperature of the produce, as a temperature differential greater than 10 degrees can create a vacuum and draw water into the pulp through the stem. If there are pathogens in the water, they can also be drawn into the produce pulp.



## Cleaning and Sanitizing Procedures

- Choose food contact surfaces that are easily cleanable and can be sanitized or disinfected, such as stainless steel, frp/dairy board, plastic or laminate. Wood is porous and is not considered easily cleanable.
- Cleanliness and sanitation of the pack area is key to minimizing risk of contamination. Create a daily cleaning and/or sanitizing schedule for your pack area. Clean more frequently if needed, depending on crop or field conditions. If mixing sanitizers with water, use only potable water and follow the label instructions.
- Instruct and post signs reminding employees to wash their hands prior to handling produce and touching food contact surfaces in the pack shed. The hand washing sink should be separate from the sink(s) where produce is rinsed. Label each sink for its specific use.
- Clearly mark all containers for culls, compost, trash, and recycling so that they will not be confused with harvest or storage containers. Discard compost and culls daily so as not to attract vermin and insects.
- Store dirty harvest containers away from clean produce, shipping and storage containers, and storage areas.
- Store shipping and storage containers off the floor (e.g., on pallets) in a clean, dry, and covered area.
- If rodents are a problem in packing areas, set and check traps regularly. Keep a space of 18" between walls and stored items, as mice do not like cross exposed areas. For more on rodent control, see: <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/FST-34.pdf>
- An easy way to remind employees of Standard Operating Procedures (SOPs) in the pack area is to post laminated signs above sinks and other areas where following procedures is important. Examples of pack shed SOPs include adding sanitizer to wash water and cleaning and sanitizing of equipment and work surfaces. See the *On-farm Cleaning* fact sheet for an example.



*Stainless steel sinks and surfaces are easy to clean and can often be found used at auctions or restaurant supply stores. Plastic sinks are also a good choice and can be sanitized.*

April 2013. Center for Sustainable Agriculture, University of Vermont Extension. <http://www.uvm.edu/~susagctr/?Page=gaphome.html>

UVM Extension helps individuals and communities put research-based knowledge to work. Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. University of Vermont Extension, Vermont. University of Vermont Extension, and U.S. Department of Agriculture, cooperating, offer education and employment to everyone without regard to race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or familial status. Any reference to commercial products, trade names, or brand names is for information only, and no endorsement or approval is intended.