

## Remaining Questions from Harvest Sanitation: It's More Than Hopes and Dreams

April 6, 2023

*Below are the questions from the Q&A session that were not answered due to time. Identifying information has been removed and grammatical or spelling errors corrected (expressed in brackets), but the content of each question has not been changed from how it was submitted.*

### General sanitation strategies

1. Are there special requirements for cleaning of harvesting equipment that [are] being used for [nighttime] harvesting operations? Think of lighting and sanitation worker safety.

Lighting for most Harvesters is adequate for harvesting needs, providing light to areas where work is completed in harvest mode. Adding lights to tops of elevators and having flood lights on the truck or trailer used for wash to highlight poorly lit areas is advised.

-JK

2. Are there any sanitizing protocols/products that protect equipment in between cleanings to reduce [cross-contamination]?

If the equipment is left idle for multiple days, some companies have implemented a re-wash with detergent and sanitizer. Especially if there are vinyl/cloth backed belts as they will hold moisture for extended periods of time and we have seen these as problematic in micro counts increased with time, moisture and temperature promoting growth. Definitely want to make sure all surfaces are rinsed and sanitized at a minimum prior to harvest every time.

-JK

3. Are fungicides applied only post-harvest to manage fungi from storage and transport to retail sale? Are they incorporated with sanitizers at harvest?

I have not seen any fungicides incorporated in sanitizers at harvest. However the EPA registration on some sanitizers such as Peracetic acid and Sodium Hypochlorite do have some Fungi claims.

-JK

Depending on the type of crop, fungicides can be applied to the crop pre-harvest (for example to control powdery mildew in spinach) or post-harvest (for example to prevent crown rot on bananas or butt mold on pineapples) to prevent quality issues. Effective, validated sanitation of harvest equipment would prevent the equipment itself from spreading fungi to multiple harvest lots.

-ND

4. Do you have any recommendations or resources for sanitization in [hand-harvested] commodities?

Glove and Knife controls, some hand harvested products have canvas bags or totes. all would want to be reviewed for best method to wash, store and verify as clean before use. We have looked at cabinets for using the ClO2 (chlorine dioxide) for gassing apple and stone fruit collection bags. More to learn.

-JK

Whether products are harvested completely by hand, by a completely automated harvest process or a hybrid of the two, any sanitation of equipment should follow the seven steps of sanitation. The method of application of each step may be different (for example, handheld utensils like knives may be washed, rinsed and sanitized in a bucket system vs. a full harvest rig which would be cleaned in place) but the steps will be the same. And regardless of the program, any sanitation protocol should be validated to ensure that the process when executed as designed is capable of knocking down the micro load to safe levels.

-ND

5. [Do] any [private] sanitation [companies exist] for harvesting equipment[?]  
Yes, there are regional providers. Good questions to ask are related to capabilities and costs as these companies often have similar time demands for servicing multiple companies. Example, tender leaf machines are likely all harvesting along a schedule based on weather. So if all machines are down at one time how would your company fit in their schedule.

-JK

#### Specific Dole questions

1. What is Dole's acceptable APC range for a harvester's food contact surface[?]  
Within the industry workgroup around harvest equipment sanitation, there was a microbiology work group which looked at the different microbiological metrics and the appropriate thresholds. This group was made up of individuals from a number of different companies, including Dole. Data from different companies and different cleaning processes was collected for the microbiological workgroup to analyze. Based on this work, Dole has adopted the threshold of 2000 cfu/swab as a target maximum.

-ND

#### Specific Factor IV questions

1. You had a slide comment that said that you had technologies or procedures that lasted 72+ hours. If this is the case, can this be accepted as a general overall procedure which could save [man-hours]? Can you address this a bit more[,] please?  
Yes, we are working with Cal Poly, SLO reviewing and matching lab activities with our field activities for Pure Biosciences on their silver ion technology. They have a fine mist that is applied and then followed by a food safe coating that creates a covalent bond on the surfaces. We have some literature that is due to print soon, showing after 2-3 days of harvest and wash activities that the surfaces treated were 1-2 logs lower in APC than the control surfaces. Not that this is a solve everything solution but might be another weapon in harvester sanitation arsenal and labor savings.

-JK

2. Can you further explain the D7-foam [and] fog process?  
Decon 7 is a cleaner / disinfectant that requires 3 concentrates to be mixed creating an excellent solution. For field equipment we are using this when equipment is brought out the shop area and broken down for the Periodic cleaning. Very good results on micro post use. Clean Break is the goal. We are aware that the solution expands if stored in containers that don't breathe so for field use we recommend pictures in lids if transported to field. A solution is ok to use within 24 hours of mixing but best to use soon after mix.

-JK

3. Can badly designed tool/brush spread contamination, and do you see this happening at the field level?

Yes and Yes. We recommend the harvesting companies complete a verification of SSOP with pre detergent, post detergent rinse and after santinize to see if they control all aspects desired. We have see post detergent numbers elevate on atp and apc related to brushes and scrub pads that were not in good condition.

-JK