Module 19
Packhouse Sanitation

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Reference

Please consult the CRI Production Guidelines volume IV for more information on packhouse sanitation.

Introduction

Packhouse sanitation is a critical step to prevent fruit contamination in the packhouse, and especially to prevent fruit from becoming re-contaminated after it has been treated.

The idea is to keep the spore load inside the packhouse as low as possible, by not allowing infected fruit into the packhouse in the first place, and by immediately removing infected fruit from the packhouse if they are found.

Fruit that were removed after being treated with fungicides and during grading should be removed and stored outside the packhouse, because if they decay inside the packhouse, it promotes the development of spore populations that are resistant to fungicides.

Packhouse sanitation also creates a clean working environment for packhouse workers.

An effective packhouse sanitation plan consists of a multifaceted approach. Actions that must be included in this plan are:

- Effective pre-sorting
- Removing and destroying decayed and infected fruit
- Equipment and work area sanitation
- Personal hygiene
- Good recordkeeping practices
Pre-Sorting

Preventing infected and decayed fruit from entering the packhouse is the first very important packhouse sanitation action.

In degreening rooms, fungal diseases start to develop faster because of the favourable conditions in the rooms. There is therefore often severely decayed fruit in the bins when they come out of the degreening rooms. You may also find decayed and infected fruit in the bins coming from the orchard.

These green bombs must be removed before the fruit is dumped into the washing system, and must never be allowed to enter the packhouse. This is the main purpose of pre-sorting.

Even though the fruit washing system contains a sanitizer, green bombs will still contaminate the rollers and brushes and cause the system to become dirty, which means that it will have to be replenished more often. In this regard it is also extremely important that concentrations of sanitising agents in washing systems must be managed very carefully.

During pre-sorting fruit that is obviously not fit to be exported is also removed and channelled to the local market or processing bins. This fruit must be kept outside the packhouse, or in an area that is separate from where the export fruit is handled, and dispatched to its destination as soon as possible.

It will sometimes happen that contaminated fruit is missed during pre-sorting. If such fruit is found on the grading line or in a packing bin, or anywhere else in the confines of the packhouse, the packline must be stopped immediately and the area must be disinfected.

Removal of Fruit

Never allow any fruit to lie around in the packhouse and develop spores. All fruit that has been culled during sorting and grading, or that has fallen on the floor or that has been discarded for any other reason, must be removed from the packhouse environment regularly.

Fruit that is removed from the packline after the fruit were treated with fungicides are especially dangerous. The spores that are active on this fruit are most likely resistant, and can cause major losses.
Also remember that sour rot can be spread from infected to healthy fruit in the packhouse by vinegar flies that are attracted to the sour odour. This fruit must not be allowed to remain in the packhouse environment.

The golden rule is if it is not going to be exported, it must not be in the packhouse. Store fruit that is destined for the local market or for processing outside the packhouse, especially after the fruit has been treated with fungicides.

Fruit that is severely infected and that cannot be sold on any market must be collected, removed, and destroyed, either by chopping it up at a sight away from the packhouse and allowing it to dry out in the sun, or by burying it.

The export fruit must also not be allowed to stay in the packhouse for long periods of time after it has been packed, especially in hot conditions.

Remember that a number of the postharvest diseases develop faster at higher temperatures. Export fruit must either be pre-cooled at the packhouse immediately to stop the development of diseases, or dispatched to pre-cooling facilities.

Store your retention samples of each export batch in a separate area, and check them regularly for the development of diseases.

**Retention Samples**

Retention samples are made up of one carton from each batch of fruit packed in the packhouse. These cartons must be kept for at least three weeks at ambient temperature, and checked regularly for the development of postharvest diseases.

**Equipment and Work Area Sanitation**

In terms of equipment and work area sanitation, the three important aspects are the:

- Sanitising agents that are used
- Method that is used to apply them
- Frequency of application
Sanitising Agents

Quaternary Ammonium Compounds

The sanitising agents that are used most commonly in packhouses are quaternary ammonium compounds. Also known as quaternary ammonium salts, these salts are able to clean and disinfect a surface, no matter what the pH balance of the area is.

This property makes quaternary ammonium compounds ideal for cleaning and disinfection in packhouses, where citrus oils and juice can create areas of differing pH that have to be sanitised.

Recommended Concentrations

To ensure effective sanitation, the concentration of the active ingredient must be carefully managed when the cleaning solution is mixed.

There is a range of quaternary ammonium compounds on the market. Always follow the manufacturers’ recommendations, as the volume of active ingredients is each product can be different.

Cleaning Methods

The cleaning solution is now applied to all surfaces in the packhouse, including surfaces that come into contact with fruit, such as grading tables, brushes, rollers, sizer cups, and packing tables, and the floors and walls of the packhouse. Also remember to sanitise all picking bins and trailers after they have been emptied and before sending them back to the orchard, especially bins that was used for degreening.

It is important to clean all equipment and work areas thoroughly. The most thorough way of applying the cleaning solution is by using knapsack sprayers to douse equipment with the solution, and to use clean cloths to wipe down other surfaces in the work area with the solution. Follow the manufacturer’s recommendation in terms of the concentration and the contact time of the solution on surfaces.
Walls and floors must be cleaned daily, because fungal spores can become airborne. Dirty walls can lead to contamination of fruit by infecting personnel’s hands and clothes and then being carried to the fruit.

**Frequency**

It is important to sanitise the packhouse regularly. Sanitisation costs money and time, and it must therefore also be done efficiently and effectively.

All packhouse areas should be cleaned and disinfected at least once a day. Sensitive areas, such as the pre-sorting lines that easily become infected, must be cleaned more regularly, preferably at every shift change. A cleaning schedule should be used to ensure that the frequency of cleaning is maintained.

Remember that if contaminated fruit is found on the grading line or in a packing bin, the whole line must be stopped immediately and disinfected.

**Personal Hygiene**

Ensuring that packhouse personnel follow good personal hygiene practices is part of a packhouse sanitation strategy, as it will prevent spores from spreading.

Workers must always have short nails and clean hands, and they should not have any open sores or injuries. They must wear protective clothing when in the packhouse, specifically hair coverings, overalls, and, in some cases, gloves. Clothing must be kept neat and clean.

No jewellery, rings, watches, or necklaces are allowed in the packhouse, as jewellery can cause injuries to fruit and also be a source of contamination.

Notices should be posted in the locker room and bathroom areas to remind workers to maintain their personal hygiene, and especially to wash their hands regularly. Supervisors must check all workers before they are allowed in the packhouse to ensure that these practices are adhered to.
Recordkeeping

Recordkeeping is essential in managing and controlling a packhouse sanitation system.

Records must show the frequency of cleaning, as well as the chemicals used and the concentrations of those chemicals in the cleaning solutions. Records should also be kept of personal hygiene inspections and any emergency, or unscheduled, cleaning that takes place.

active learning

Watch the DVD clips, read through the learning material and do workplace research to gather the knowledge and information to complete the assignments below.

Activity 19.1 – Mind Map

An effective packhouse sanitation plan consists of a multifaceted approach. Draw a detailed mind map explaining how the following actions associated with packhouse sanitation are handled in your own workplace or at the packhouse where you are completing your practical training:

- Effective pre-sorting
- Removing and destroying decayed and infected fruit
- Equipment and work area sanitation
- Personal hygiene
- Good recordkeeping practices

Add information on your mind map about:

- Why packhouse sanitation is important
- Recommendations for your own packhouse on how each of the processes may be improved

Activity 19.2 – Workplace Logbook

You have to complete the tasks associated with cleaning and sanitation as part of your practical learning. Make sure that your workplace supervisor or team leader observe you while completing these tasks and sign off your logbook.
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SOPs:

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