Module 18
Fruit Washing Systems
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Reference
More information on fruit washing can be found in the CRI Production Guidelines, volume IV.

Introduction
The wet or dry dump is where fruit enters the packhouse for the first time, either after going into degreening, or directly from the orchard.

At this point, the fruit must be washed to remove spores, organic material, and dirt that may have collected on it in the orchard and during picking and transport.

Washing Systems
There are two types of washing systems in a packhouse. There is a dry dump system and there is a wet dump system. Some packhouses have both systems in place, and they use both systems for washing the fruit. Most packhouses only have one or the other. The cleaner you get the fruit into the fungicide treatments, the better.

Wet Dump System
The softer option is the dump tank option, where you are dumping fruit directly into a bath with a water system.

That is a softer handling system for soft citrus, and is in use especially in certain areas that produce a lot of soft citrus, in other words the easy-peeler types like naartjies. Soft citrus are very susceptible to injuries and the softer the handling of the fruit in a washing system the better it is on the fruit.
The spores and the organic material wash off the fruit into the water. That water has to be sanitised by means of a sanitising system. In the packhouses in the citrus industry, we use chlorine as a form of sanitizer and we use quaternary ammonium compounds. Those are the two compounds that we have for those purposes in the industry.

These products are added into a dump tank. Depending on the size of the dump tank and the concentration recommended, the amount of product will differ. The packhouse must work out their concentrations. They have a test kit that they can test that concentration on a regular basis through the day's production to maintain the concentration at a level where it is going to work efficiently to keep that system sanitised.

**Dry Dump System**

The same applies to the other washing system, the dry dump washing system, where the fruit moves over a belt and over a bed of brushes with a set of nozzles.

The water is kept and sanitised in a reservoir below the washing system and it gets pumped through the nozzles, onto the brushes and the fruit moves over the brushes and gets sanitised that way. This works just as effectively as your wet dump system.

The water used in these washing systems has to remain clean, in other words it has to be sanitised. All the spores that are washed off from the fruit into the system have to be killed. If the concentration of the sanitizing agent is not maintained at the correct levels, a build up of spores will occur. The spores start multiplying in the system and become a source of inoculum.

**System Sanitisation**

So it is vitally important to keep the system as clean as possible right throughout the day's production. At the end of the day there will be a build-up of spores, a certain amount of spores, and there will be a build-up of organic material, dust and mess in the system.

This build-up eventually leads to a formation of bio-film round the edge of the system, which is an accumulation of microorganisms, fungi, bacteria and your whole system becomes soiled.
So at the end of the day’s production, the systems have to replenished, on a daily basis. The water has to be replaced in the dump tank – clean water for the next day’s production – so you don't get a carry over of a build-up of millions of spores and allow it to become so soiled.

At the end of the day, it becomes like a pea soup that you are washing your fruit in. So vitally important, on a daily basis to change those washing systems around, and replenish them and start with a new, fresh system the next day.

**summary**

**Washing Systems Dos and Don’ts**

- Use a **sanitizing agent**, such as chlorine or quaternary ammonium compounds, in water.
- Use a **test kit** to check the concentration of the sanitizing agent regularly.
- Check **brushes and rollers** regularly to avoid injuries to fruit.
- **Replace water** in systems on a daily basis.

**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 18.1 – Group Discussion**

Discuss in your the pros and cons of using a wet dump system or a dry dump system. Make keynotes in your workbook on the conclusions that you reach.

**Activity 18.2 – Research Report**

Write a 2-page report on the fruit washing system used in your packhouse, including details on the monitoring activities that are in place to ensure the correct sanitation. Include a diagram showing the flow of the water through the washing system.
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