Citrus Harvesting

Module 3:
Orchard Sanitation

Learner Guide

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Citrus Growers' Association OF SOUTHERN AFRICA
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Introduction

A packhouse is not a hospital for sick fruit. Nothing can be done in the packhouse to repair damaged, injured or sick fruit coming from the orchard. Regular orchard sanitation and good picking practices are very important to protect the fruit and keep them healthy. Always remember that fruit is a perishable product.

Postharvest Diseases

There are many different pathogens that we must prevent from contaminating fruit in the orchard. Remember that the word 'pathogen' is used for anything that can cause a disease, such as viruses, bacteria, and fungi. Most of the pathogens which cause citrus diseases, are fungi. They spread through vast numbers of invisibly small spores, and it is these spores that we must prevent from getting into our fruit.

The most important pathogens to protect against are those that get into the fruit through a wound on the fruit. This can be avoided by making sure that fruit is not injured or damaged during picking so that pathogens cannot get in. This is also why it is important that injured fruit is not put with the other fruit, because they may be carrying these pathogens to the packhouse.

There are also latent pathogens. The word 'latent' means something that is there, but not active, and waiting for the right conditions to attack. Latent pathogens live on deadwood in the trees. When it rains, fungal spores are washed down from the deadwood onto the fruit rind or into the button, where the spores lie dormant until the conditions are ideal for infection to start. Fungal spores grow best in warm and humid conditions and out of direct sunlight. In the packhouse, and especially in de-greening rooms, the conditions are ideal for these pathogens to develop.

We must also remember that there are pathogens that live in the soil. If they get a chance to get onto the fruit, they will infect the fruit and start to spread, producing more and more spores. Fruit fall on the ground for different reasons. They may have fallen off the tree after being stung by a pest insect, or they may have dropped on the ground during picking. Fruit that hangs low and close to the ground can also get soil pathogens on them. When it rains, water can splash up onto the fruit, carrying the pathogens with it. It is even possible that, when there are high numbers of flying insects in combination with rotten fruit, the insects can carry spores from fallen fruit on the ground to fruit still hanging in the tree.

Orchard Sanitation Practices

We can now start to see what we must do to keep our fruit safe and healthy.

Pruning Practices: Deadwood and Skirting

Firstly, now that we know latent pathogens live on deadwood in the trees, we can remove the deadwood so that they have nowhere to live. Secondly, by skirting the trees we can make sure that there are no branches that can carry fruit that will hang so low that pathogens that live in the soil can get onto the fruit and into the tree. In the Citrus Academy's audio-visual module on citrus pruning practices, we look at best practices for removing deadwood and skirting trees in great detail. Please watch this module.

Removing Out-of-Season and Fallen Fruit

In the third place, no fruit that has fallen on the ground in the orchard must ever be picked up and placed with other export fruit, because it has soil pathogens on it.

And lastly, we must make very sure that we remove all the waste fruit lying on the orchard floor often, so that the pathogens cannot propagate and multiply in this fruit. Also remember that pest insects, like false codling moth and fruit fly, lay their eggs in fruit. If rotten fruit is allowed to stay in the orchard, the eggs will hatch in the fruit and the larvae will grow. By leaving the rotten fruit in the orchard you also allow the pest insect to stay there, ready to attack more fruit.

All fruit lying on the orchard floor must be picked up and taken out of the orchard. A stick or scoop can be used to pick up the fruit and place it in a bag. This must be done once a week throughout the year, and at least twice a week from after colour break until picking in the orchard is finished. While the fruit in an orchard is being picked, it is best to have an orchard sanitation team following right behind the picking team to immediately pick up and remove all the fruit that might have dropped to the ground during picking.

Fruit that ripens late in the season is not as healthy and vigorous as earlier fruit, and it is risky to export such fruit. This fruit is sometimes stripped off the trees, and also treated as waste fruit. After picking, all fruit must be stripped from trees, even hard, dry fruit. If left on the trees until the next season, this fruit can be infected with pathogens, later spreading and infecting more fruit.

It is important to remove out-of-season fruit throughout the year, starting just after physiological fruit drop in November, when the fruitlets are still only the size of marbles. Out of season fruit is fruit that ripens at a different time from the other fruit. They can carry pest insects and pathogens from one season to the next.

Disposing of Waste Fruit

All the waste, late-season, and out-of-season fruit must be destroyed in such a way that the pathogens can no longer infect any other fruit. In dry climates, the fruit can be finely chopped up and spread out to dry in the sun outside the orchard. In more humid climates the pathogens can still develop in the chopped up fruit, and so best practice is to bury the waste fruit at least 30cm deep, and at least 400 meters away from the orchard. Fruit can also be collected and used as animal feed, for cattle, pigs or game.