Integrated Pest Management for Citrus

3 Pre-Harvest Blemish Analysis

Learner Guide

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Citrus Growers' Association OF SOUTHERN AFRICA
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Citrus Production Guidelines: Volume III – Integrated Pest Management, *Citrus Research International*

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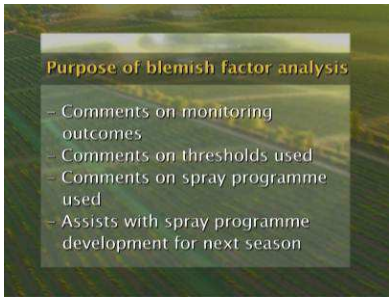
Second Edition

The first edition of the Integrated Pest Management for Citrus learner guides were exact transcripts of the audio-visual modules which they accompanied. This second edition has been updated with additional information and new developments. The changes are in *italics and underlined*.

Introduction

A blemish factor analysis is a very important exercise which needs to be conducted at the end of every season. This helps greatly in decision making for a pest management programme for the following season.

Purpose of Analysis



A blemish factor analysis effectively does four things:

- It comments on the **pest and natural enemy trends** observed through scouting during the course of the season.
- It also comments on the **threshold** which had been applied by the farmer during the course of that season. *Although many thresholds have been scientifically determined, many others are still in the process of development and it can also not just be assumed that thresholds will be identical in each different area.*
- Thirdly, the blemish factor analysis comments on the **success of the spray programme** applied during the season, and
- It helps in establishing what sort of spray programme to follow for the **following season**.

Fruit Collection Procedures

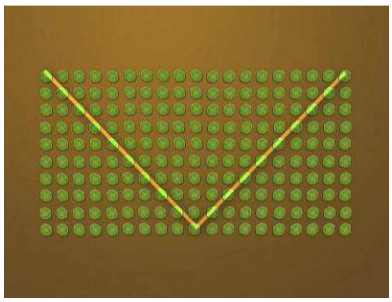
A blemish factor analysis can be conducted either in the orchard or at the packhouse.

However there are problems associated with conducting this analysis at the packhouse. If fruit are delivered to the packhouse and a sample is taken from the picking bin at the packhouse, this sample is unlikely to be representative of the orchard as a whole. It is likely to represent only a small section of that orchard.

The second problem is that fruit are often preselected in the orchard. In other words, the worst blemished fruit, which is unlikely to make the export standard, will be thrown out in the orchard and won't even make it to the packhouse.

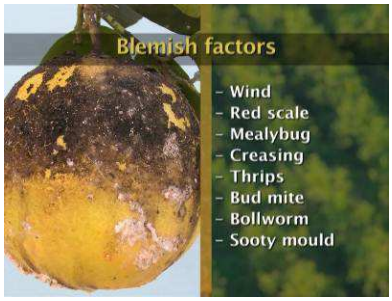
It is therefore better to conduct such an analysis in the orchard. Growers or scouts should select 50 to 100 fruit per hectare at random and conduct the analysis on these fruit. Fruit can be analysed while they are still hanging in the tree or the fruit can be picked and analysed at a later stage.

It is important that these fruit which are selected are not just from one section of the orchard but that they are representative of the entire orchard. Therefore, trees at random and fruit at random should be selected throughout the orchard in a similar sort of formation as what would be used for scouting, i.e. a diagonal line, or a V- or W-shape.



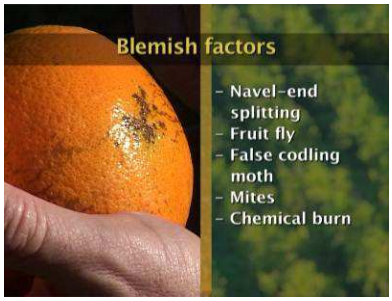
Fruit Blemishes

Every single blemish factor on the fruit should be noted and recorded. It should also be noted whether the blemish factor is just a minor scarring or whether it is sufficient to downgrade the fruit for export. In order to determine that, one needs to get hold of Citrus Research International's (CRI) blemish standards booklet so that one can categorise what is acceptable and what is not acceptable for export.



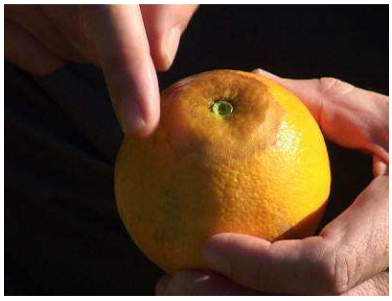
Blemish factors which should be recorded are factors such as:

- Wind
- Red scale
- Mealybug
- Creasing
- Thrips damage, and one can categorise this thrips damage as early damage, late damage or thrips scribbling
- Bud-mite damage
- Bollworm damage
- Sooty mould
- Navel-end splitting
- Fruit fly
- False codling moth
- A range of mites, e.g. flat mite, rust mite, silver mite
- Other factors, such as chemical burn

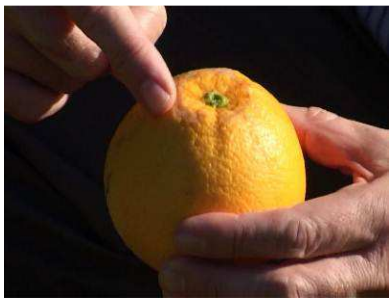


Blemish Example: Thrips

Here I have selected a few examples of thrips damage. This first one, for example, shows very severe thrips damage from early in the season when the fruit was still small. Remember that all of the feeding early in the season occurs underneath the calyx, so the further the damage has grown from the calyx, the earlier the



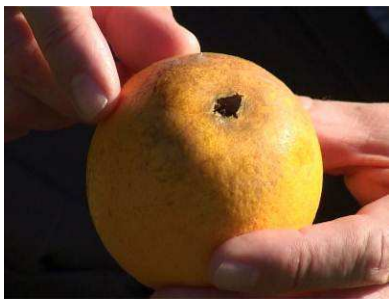
damage was inflicted.



The fact that there was no break in the damage from right up to the stem-end to far from the stem-end means that there was inadequate or no thrips control during the course of almost the entire early season.

The second example shows just a ring of thrips damage where between that ring and the stem-end it is clean. So at a fairly early stage during the season, thrips control was inadequate. Possibly scouting didn't pick up the presence of thrips early enough or the product which was used was not effective enough or reapplication of the product wasn't rapid enough. However, thereafter it appears that thrips control was adequate. Both of these examples are probably likely to downgrade the fruit for export.

The third examples shows an even less severe case of thrips damage, just a single ring of damage which occurred for a very short period of time. This may or may not downgrade the fruit for export. This example shows a very small sector of thrips damage and it is unlikely that this will downgrade the fruit for export.



Another example is late-season thrips damage which doesn't occur underneath the calyx, but occurs on the side of the fruit. This is called thrips scribbling.

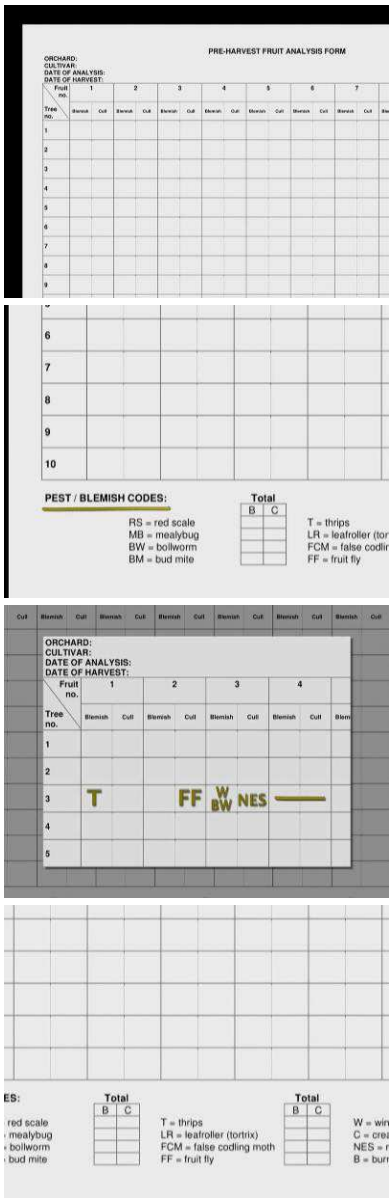
Finally, a fairly unusual form of thrips damage is damage around the navel-end, also clearly sufficient to cause downgrading of the fruit. This would also have occurred probably later on during the season.

Blemish Example: Budmite

There are three different symptoms of bud mite damage on fruit, i.e.:

- Ridging around the calyx-end
- A general flattening of the fruit, and
- Protrusion of the navel-end in navel oranges

Blemish Analysis Records



The information that is gathered when the fruit sample is inspected is entered on a form similar to this one.

In this example, each block on the grid represents a fruit. For instance, this block is for the first fruit from data tree number three.

Blemish codes are used to indicate the type of damage to the fruit. The code is entered in either the blemish column or the cull column, which is an indication of the severity of the damage. For instance, if the first fruit from data tree three has thrips damage that will downgrade it from export quality, hence T is entered in the blemish block for this fruit.

If the second fruit from the same tree for instance is infested with a fruit fly larva, FF is entered into the cull column under this fruit, because this type of damage means that the fruit has to be culled and cannot be sold at all.

If a fruit has more than one type of blemish, the codes for all the different blemishes must be entered. For example, if the third fruit from data tree three has wind scarring, bollworm damage and navel-end-splitting, W and BW is entered into the blemish block for the fruit and NES in the cull block.

If there is no damage to a fruit, a dash or line through the block is used as an indication.

Once all the blocks have been completed, the numbers of blemishes and cull factors are added up and entered into the blocks at the bottom of the form. This information can be entered into a summary sheet along with information from other orchards, where it can be analysed further.