Appendix 2. Calypso® mango quality assessment manual



Calypso® mango quality assessment manual for export markets

Perfection Fresh – DAF

November 2018

Queensland Government

CRCNA DEVELOPING NORTHERN AUSTRALIA

EXPLORE THE ESTD Perfection 1978 WORLD OF TASTE

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Introduction

Quality assessment is essential to determine what the customer is receiving, the practices in the supply chain where quality is compromised, and improvements needed at each point in the chain to meet customer requirements.

This manual provides a standard method for assessment of external quality of Calypso® mangoes focused on export markets at the point of receival. Emphasis is given on skin colour and fruit firmness (which are the key attributes to determine maturity stage and residual shelf life). Photographs of the most common skin defects are provided, including rots, sapburn, physical damage, lenticel spotting, and skin browning. Photographs of major internal (flesh) disorders are also included.

Please refer to the 'Calypso® Mango Quality Assessment Manual' for more detailed information, including description and possible causes of each defect, field defects, and less common defects. Refer also to 'Calypso Export Procedure 5 (QA on receival)' for detailed instructions on fruit sampling, assessment, and recording of QA information.

Skin colour

Assess skin colour based on the guide shown on page 5. The rating scale (1–6) refers to the percentage of the background skin colour (non-red) area showing yellow and not the percentage of the whole skin area.

Calypso® mango fruit typically changes from green to yellow as the fruit ripen.

The Calypso® fruit can be ‘eating ripe’ when still quite firm, with little change in firmness for some time after ripe. Thus, both skin colour and firmness should be used to indicate the ripeness stage, as using only firmness can be unreliable.

(Note: holding fruit under controlled atmosphere (CA) conditions, for example during seafreight, can slow down the loss of green colour and increase softness).

Calypso® Mango Skin Colour Guide

Calypso® mango skin colour guide

1



0-10% yellow

2



10-30% yellow

3



30-50% yellow

Calypso® mango skin colour guide

4



50-70% yellow

5



70-90% yellow

6



90-100% yellow

Fruit firmness

Determine fruit firmness is determined by holding the fruit in the palm of the hand and gently squeezing with the fingers or thumb when the fruit is hard, or with the whole hand when the fruit is softer to avoid bruising. Calypso® fruit are usually eating ripe at a firmness rating 3 (firm soft).

Firmness rating scale

Rating	Description
0	**Hard -** no 'give' in the fruit
1	**Rubbery -** slight 'give' in the fruit
2	**Sprung -** flesh deforms by 2-3 mm under extreme thumb pressure
3	**Firm soft -** whole fruit deforms with moderate hand pressure
4	**Soft -** whole fruit deforms with slight hand pressure



✓ Grasping with whole hand (correct)



✗ Grasping with the thumb (incorrect)

Most common skin defects

Stem end rot (firm)





Black, firm rot, usually rounded, slightly sunken. Does not penetrate deep in the flesh.

◯ 1 cm^2

Stem end rot (soft)

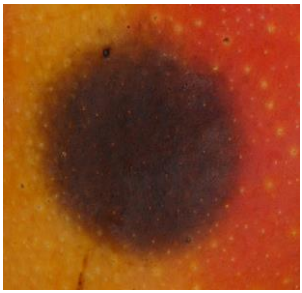




Fast growing, watery, soft rots that penetrate deep into the flesh. Grey brown or black.

Body rots





A black rot, usually rounded and slightly sunken. Appears on the body of the fruit or around the stem.

◯ 1 cm^2

Dendritic spot





Small black spots with irregular edges. It is slowly growing and does not penetrate in the flesh.

Sap burn

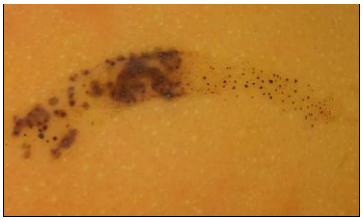




Dark brown spots and blotches, often slightly sunken. Can appear as runs or streaks down the cheek or around the shoulder.

1 cm^2

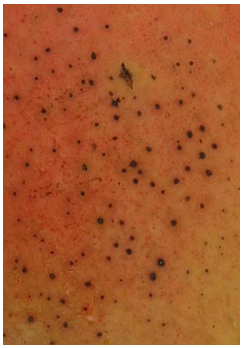






Lenticel spotting

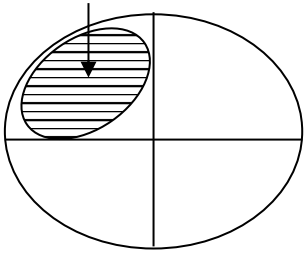


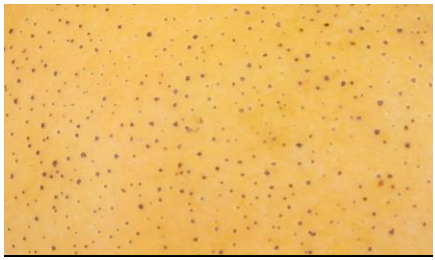


Round or star shaped spots scattered over the skin.



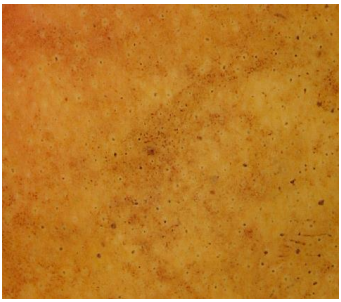
Area = 10% of fruit surface





Skin browning

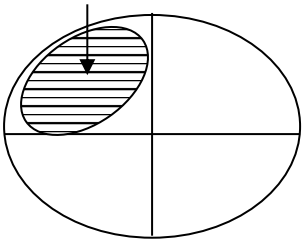


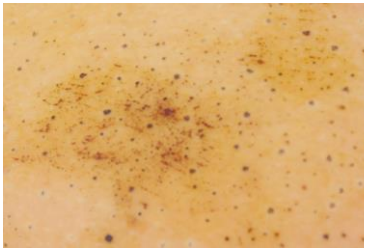


Light to dark brown flecking, blotches, smears or rings, which usually becomes more severe as fruit ripens.



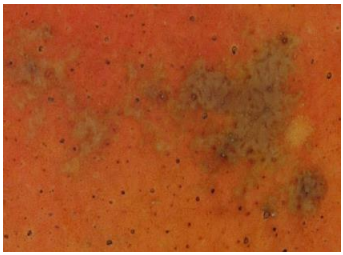
Area = 10% of fruit surface





Heat/cold damage





Large areas of brown to grey discolouration, usually around the middle of the fruit. Irregular sunken areas can occur if severe.

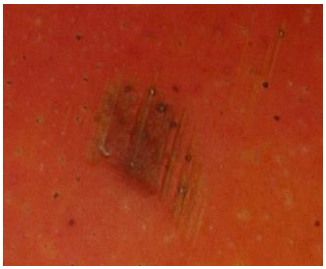
1 cm^2





Abrasion/rub marks



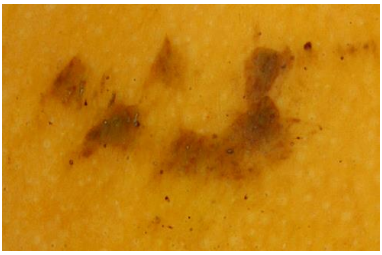


Small light brown streaks or scratches often together with skin browning. Usually superficial.

○ 1 cm^2







Crease marks





Random, irregular, depressed brown lines, indentations or marks on fruit.

1 cm^2

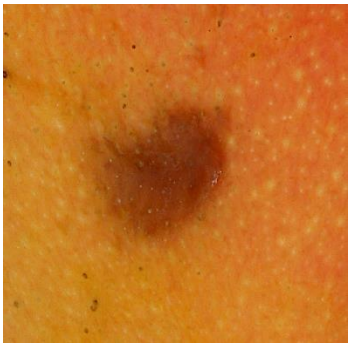






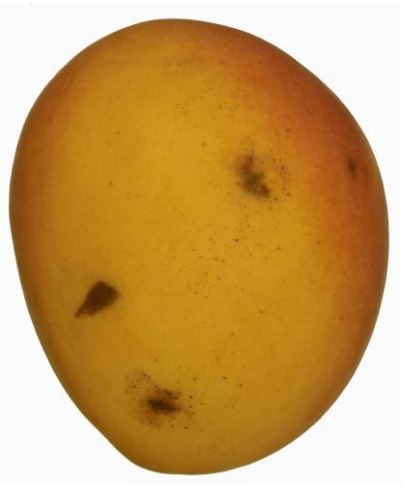
Stem damage (punctures)





Small, brown marks on the fruit, usually sunken.

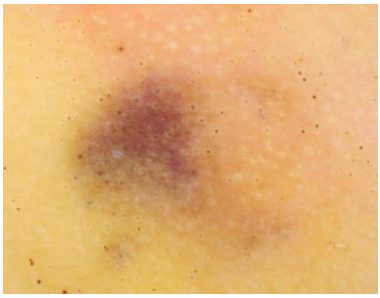
◯ 1 cm^2



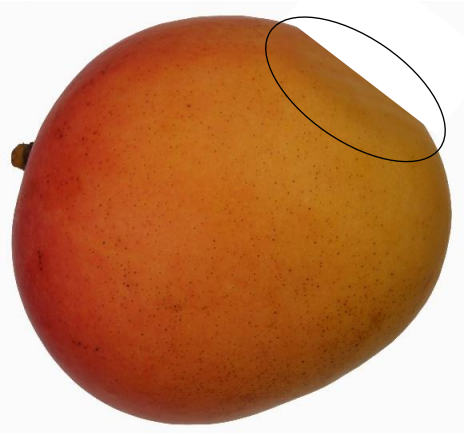


Bruising





Compression damage (flat areas)





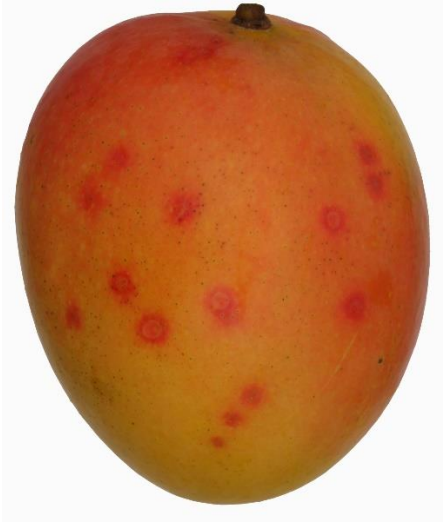
Field blemish: Sun burn / sun bleaching

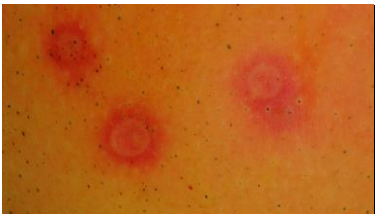


Bleached or yellow patches, usually on the exposed shoulders of the fruit

○ 1 cm^2

Field blemish: Pink spot





Conspicuous pink spot on the fruit caused by scale infestation in the field.

Field blemish: Tree/wind rub



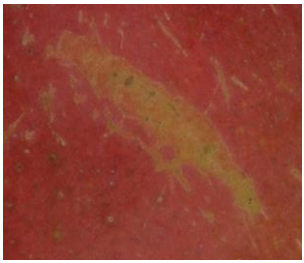


Discoloured or black superficial areas of healed scar tissue on the skin.

1 cm^2

Field blemish: Russet





Light-coloured blemish appearing as silver lines or blotches on the skin of the fruit

Misshapen



Wounds / cuts





Internal disorders

Stem end cavity



Occurs at the stem end, initially as watery patches in the flesh; as it develops, the flesh collapses, leaving a distinct cavity



Soft nose



Flesh toward the nose of the fruit ripens more rapidly than the rest of the flesh, becoming over-soft, dark yellow and watery.

Internal disorders (cont.)

Jelly seed



Similar to soft nose, but the flesh around the seed ripens more rapidly than the rest of the flesh, often with an ‘off’ odour and flavour.

Flesh browning



Dark brown discolouration of the flesh, which can start as small areas with smaller darker spots, usually near the seed.

Internal disorders (cont.)

Flesh cavities



Cavities in the flesh not restricted to any specific area. Can have a white boarder around the cavity.

White patches



White areas in the ripe flesh, which can be small ‘rice-sized’ spots, small streaks or larger areas, often firmer than the surrounding flesh.