Key field practices impacting melon quality in domestic and export markets

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Introduction

In a project led by Melons Australia, the Queensland Department of Agriculture and Fisheries (DAF) has been working directly with melon growers and export agents, to understand issues that impact on the supply of good quality melons to export markets.

The following information includes some lessons learned that are useful for melon growers supplying domestic markets as well as exporters.

Pre-harvest

Pre-harvest factors such as soil health and nutrition can impact fruit robustness, quality and shelf-life.

Disease. Consider growing only one cucurbit crop per year on the same ground and rotate to other plant species for a break. Build-up of pests and diseases, such as Alternaria and Fusarium (Images 1 and 2) in soil is more likely when double-cropping. Poorer root health and crop vigour impacts productivity but also fruit robustness which is of particular concern in longer supply chains and sea-freight export.

Image 1: Alternaria fungus on ground spot (left) and Alternaria causing internal rot (right) in rockmelon. Previous crop on the block was rockmelon of the same variety.

Image 2 Fusarium causing stem end rot in canary-type melon.

Calcium has a positive effect on fruit quality, improving vitamin C content, firmness and storage ability. In muskmelon, 80% of calcium accumulation occurs within 20 days after flowering (Bernadac 1996). Soil moisture must be adequate during this period to ensure calcium uptake. Check nutrient levels using soil tests well before planting as it takes months for calcium to become available after lime application. Leaf testing provides an opportunity to correct deficiencies before yield or fruit quality are affected. Excessive nitrogen fertilisation can worsen calcium deficiency and result in soft fruit which transports poorly and is susceptible to rots.

MRLs. Since Maximum Residue Levels (MRLs) regulations can change periodically, growers and exporters must regularly check that the pesticides used in their spray programs are compatible with the intended market. For example, Imazalil post-harvest fungicide has a ZERO MRL in Japan. Visit the Federal Department of Agriculture, Fisheries and Forestry website MRL Databases - DAFF (www.agriculture.gov.au), look for your country of interest and check the most current list of MRLs for your produce.

Rain close to harvest increases the likelihood of external quality defects and rot development (Image 3). Growers should avoid the risk of exporting melons harvested soon after rain as fruit breakdown is more likely in longer supply chains.

Image 3 Honeydew melon with severe ground spot after rain (left) and rotting in carton (right).

Harvest

Pickers may tend to throw rather than place melons on the conveyor. Melons can bounce against steel supports in the process (Image 4).

Image 4: Tossing rockmelons at harvest (right) against steel supports (left) can damage fruit.

Padding on metal bars wears out (Image 5) and exposes fruit to potential bruising and abrasion.

Image 5: Worn padding on harvest equipment (left) and impact damage on a specialty melon (right).

Drop height. Melons were observed dropping over one metre from the conveyor into plastic bins (Image 6). A padded mat is used to cushion melons, but this does not prevent regular instances of direct contact with the bottom and sides of bins.

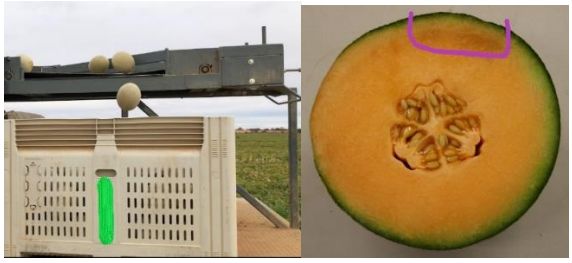

Image 6: Dropping fruit into field bins (left) can cause bruising (right).

Brix - Low and variable! Consumer surveys have identified that melon consumption is hampered by low satisfaction due to poor or inconsistent eating quality, particularly low sweetness (Jovicich and Wittl 2017). Long shelf-life rockmelon varieties travel well but do not naturally "slip", meaning that some immature melons (lower brix) may be picked. Brix measured in a recent rockmelon consignment varied from 9˚ to 13˚ at dispatch. Use a refractometer to check brix before harvest (Image 7). Melon brix should be above 10˚ (Rogers 2013). Japanese melon importers expect a minimum brix of 12˚ but prefer 14-15˚.

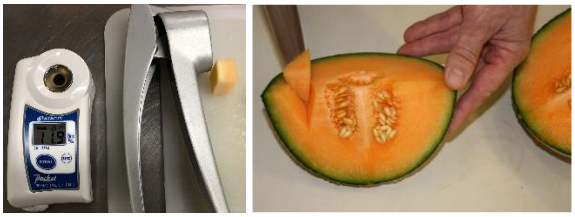

Image 7 Checking "sweetness" of melons using a digital refractometer. Always take the flesh sample halfway between the skin and the seed cavity.

References

Bernadac A; Jean-Baptiste I; Bertoni G; and Morard P (1996) Changes in calcium contents during melon (Cucumis melo L.) fruit development, Scientia Horticulturae 66: pp. 181-189

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Acknowledgements

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