

International Macadamia Symposium 2023



MOVING FORWARD TOGETHER

Macadamias South Africa (NPC)
(SAMAC)



**Preserving Quality
from
Orchard to the Factory**

-
Dorran Bungay



The Purpose?

To produce a popular, highly nutritious, premium quality macadamia kernel for the discerning consumer

... and thereby delivering the highest possible income for the grower as a reward for an intense season's effort





Premium Macadamia Quality?

The Processor must be able to sell every kernel to an increasingly sophisticated, health conscious consumer who is becoming more intelligent about his/her culinary preferences and tastes.

Premium Quality has High Market Demand:-

Less than premium quality means
'lower prices paid'!



What is Macadamia Quality?

Quality macadamia kernel that achieves maximised financial income has four, non-negotiable attributes

1. **Aesthetics** - must look appealing (colour, size, damage free - insects, mould, discolouration, smooth & dust free)

3. **Flavour** - must meet the advertised expectation of smell and taste

5. **Palatability** - must have a smooth, creamy texture after a satisfying initial 'crunch'

7. **Shelf-life** - must be correctly handled & packaged to stay fresh & hygienic (not stale or rancid) for 1 - 2 years depending on style



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Macadamia Farming Promises a

Rich Reward

But only for

Those Who Learn the Skill Sets!



Macadamia Kernel quality Requires Two Sets of On-farm skills:-

1. Pre-harvest in the Orchard
2. Post-harvest Preservation





Skill Set (1) - Pre-harvest in the Orchard

- Climate understanding
- Land & soil selection
- Cultivar choices & Source
- Orchard preparation & Planting
- Phenology - irrigation & fertilising
- Entomology - chemicals & MRLs
- Flowering, pollination & diseases
- Pruning & mulching
- Scouting & orchard hygiene
- Maturity assessment & harvesting



Skill Set (2)

**On- farm Post-Harvest
Preserving Quality**

The Mind Set Detail

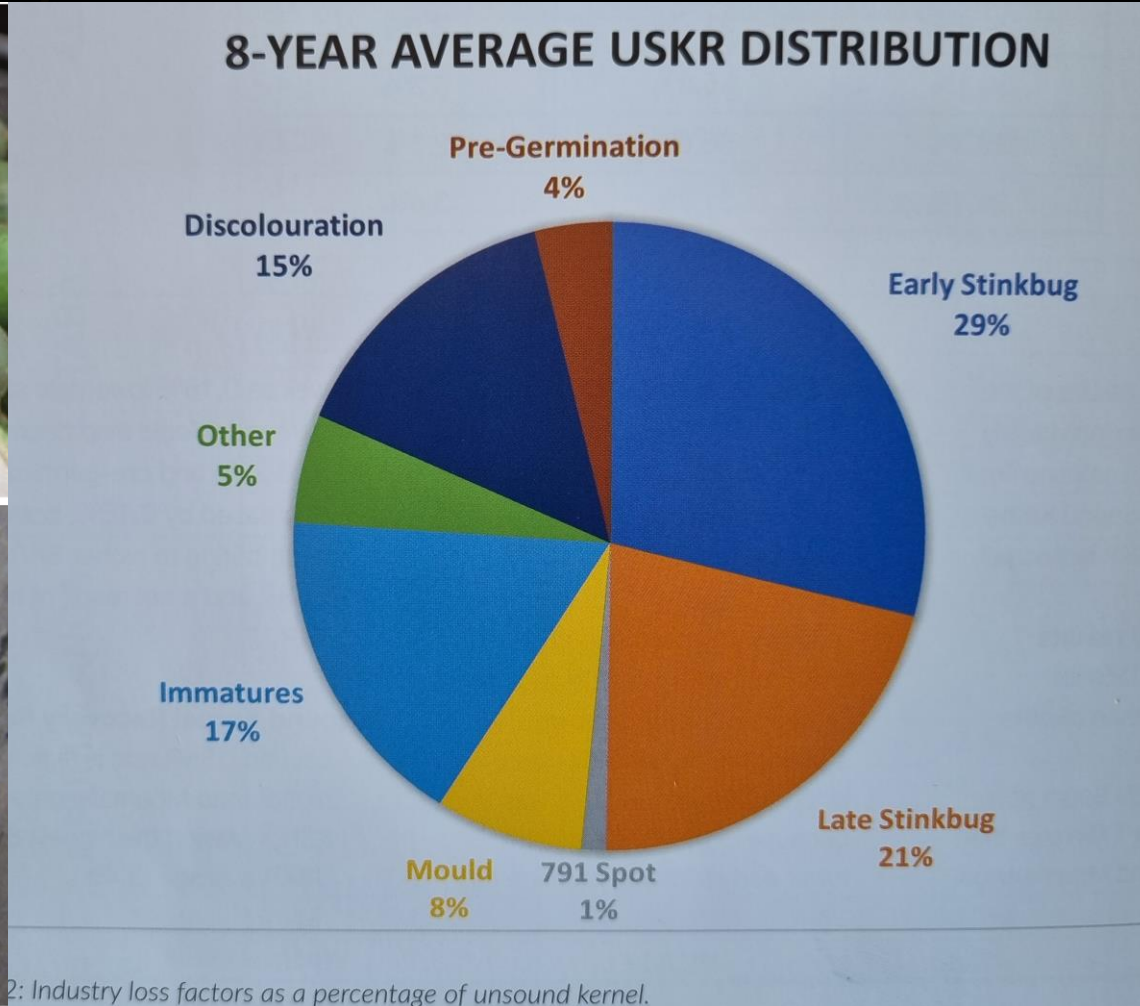
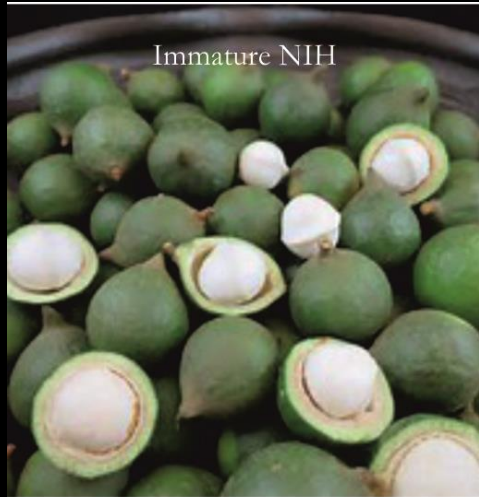


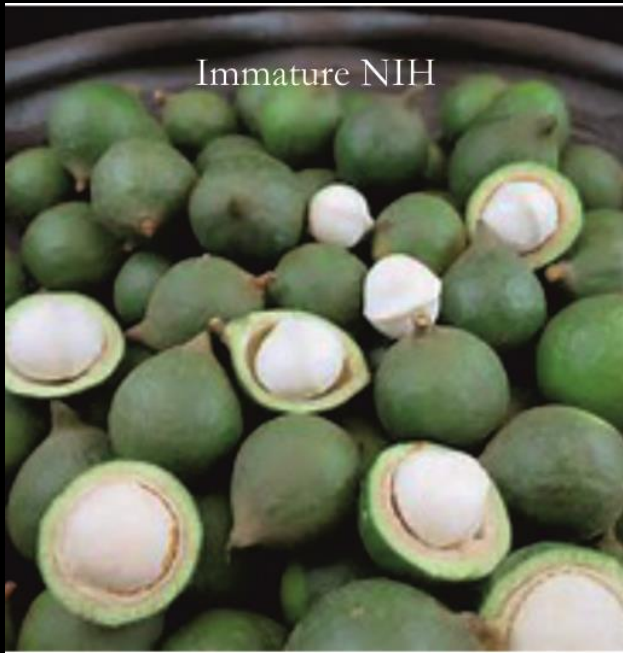
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UNSK = 3.5% Annual ave. Annual loss ave = + R250m





Skill Set (2) Post-harvest Preservation

The Risk Mind Set

- Immature kernel have low or no value
- Macadamia husk holds water
- Macadamias are a high value food source, everybody wants it (disease, mould, bugs, rats, theft)





Skill Set (2) Post-harvest Preservation

The Risk Mind Set

- Macadamias have the highest risk factor of all nuts a lettuce in a hard shell!
- Susceptible to bruising (dehusker & dropping)
- Susceptible to heat, water and time delay (on ground, during dehydration, in storage, on transport)
- Susceptible to rapid rancidity and *irreversible* loss of shelf-life (Pv & FFA)





Skill Set (2) - Post-harvest Preservation

The Risk Mind Set

- Free water outside of the shell & inside of the kernel creates high risk & is responsible for many irreversible losses
 - Husk is a moisture reservoir for premature germination
 - Designed to absorb water (want to become a tree)
 - Staining and discolouration
 - Mould, disease and insect infestation
 - Rapid metabolisation (composting & fermentation)



Skill Set (2) - Post-harvest Preservation

Salient Mind Set on Risk Management

- Main loss risk factors are water, heat and time!
- The Processor is not a hospital!
- De-husking must be soft (no bruising/breakage)
- Immaturity and obvious USWIS must be sorted out
- On-farm processing systems capacity too small?
- EMC Curing (not incomplete, erratic, or over- drying)
- Accurate unsound NIS sorting after curing
- Dry, cool bulk storage if delivery is delayed
- System safe from fungi, diseases, insects, vermin, theft



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In Conclusion

Top seven top tips for preserving quality in macadamias between orchard and factory





- Macadamias are, contrary to popular belief, highly perishable - ‘a lettuce in a hard shell!’
- Ensure orchard floor hygiene prior to abscission and harvesting
- Gather (harvest) mature nuts rapidly within a week of abscission, sooner if there is rain and if the orchard floor is wet. De-husking must be done on the same day as harvest
- Do not harvest NIH into plastic bags or containers that have no ventilation
- Handle NIH and NIS gently - avoid bruising the kernel by dropping or other deformation (e.g. squeezing in a dehusker)
- Macadamia NIS must be cured (not dried) immediately after harvest at the correct temperature and relative humidity
- The on-farm operation from abscission through to dispatch, after thorough sorting, to the processor should be achieved as fast as possible, ideally within two weeks



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Thank You

Dorran



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Questions?

