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# TEMPERATURE MONITORING, FOOD LOSS AND WASTE IN THE MANGO EXPORT VALUE CHAIN

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# INTRODUCTION

- Food loss and waste is a topic of interest the world over
- The United Nations estimates that US$1 trillion worth of food is lost each year, which is about a third of global production
- This loss may be higher on highly perishable products
- This loss is catastrophic in many ways
- The PPECB took interest in this topic at a granular level

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# OBJECTIVES

1. To monitor food loss and waste in the export value chain of mango fruit, starting at farm level
2. To monitor temperature control during handling and export of Mango fruit
3. To suggest further research to reduce issues identified in the trials

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# METHODOLOGY

- Trial was conducted in Hoedspruit
- Cultivars: Kiett and Shelly
- Seasons: 2024/25 and 2025/26


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# RESULTS: Fruit quality at harvest

| Trial Site | Sunburn (%) | Blemishes (%) | Injuries (%) | Black spot (%) | Poor Size (%) | TOTAL (%) |
|---|---|---|---|---|---|---|
| Farm 1 (2024/25) | 3.4 | 0 | 0.9 | 0 | 7.7 | **12.0** |
| Farm 2 (2025/26) | 6.4 | 5.5 | 1.0 | 0.7 | 8.1 | **21.7** |

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# RESULTS: Fruit quality in the packhouse

| | 2021/22 | 2022/23 | 2023/24 | 2024/25 | 2025/26 | Packout | TOTAL |
|---|---|---|---|---|---|---|---|
| Volume inspected (CTN) | 785383 | 616329 | 1022081 | 1579170 | 1515302 | | 5528365 |
| Volume rejected | 9180 | 3772 | 11336 | 14870 | 18144 | | 57302 |
| Percentage (%) | 1.15 | 0.61 | 1.11 | 0.94 | 1.2 | | 1.04 |

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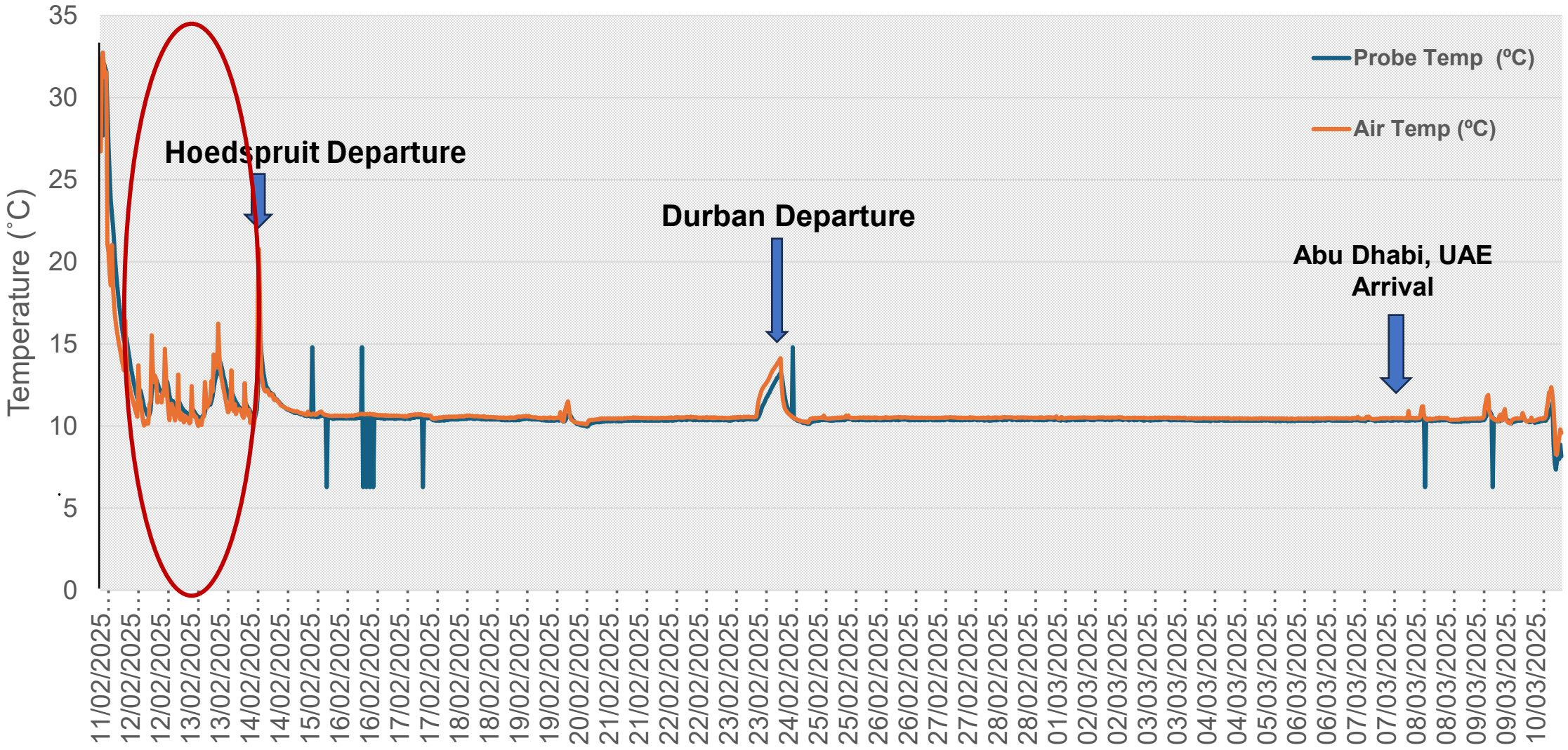
# RESULTS: Fruit quality in the packhouse

| Quality Parameter | Percentage (%) |
|---|---|
| Incorrect fruit weight and size | 27.6 |
| Incorrect carton markings | 26.1 |
| Chemical residues | 21.0 |
| Jelly seed | 7.1 |
| MRL Exceedance | 7.1 |
| Excessive wax | 2.9 |
| Mango Weevil | 2.9 |
| Old fruit | 2.4 |
| Incorrect documentation | 1.4 |
| Dirty fruit | 0.9 |

# Temperature profile: Farm 1

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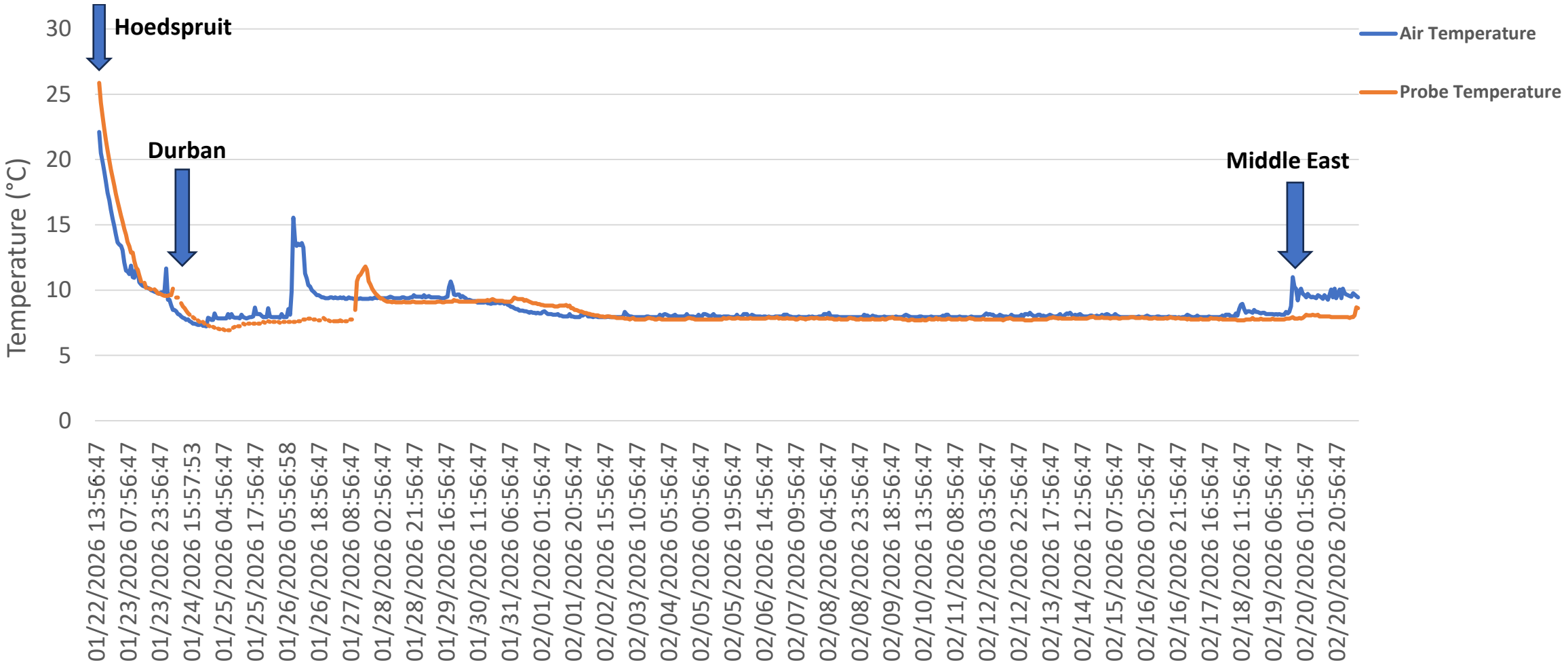
# Temperature profile: Farm 2

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# Fruit quality on arrival: Farm 1 (Kiett) CA – $O_2$ – 12%, $CO_2$ – 10%

| | DECAY (%) | SOFT FRUIT (%) | PROGRESSIVE (%) | TOTAL DEFECTS (%) |
|---|---|---|---|---|
| FARM 1 | 34.8 | 23.2 | 10.1 | 66.1 |

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# Fruit quality on arrival: Farm 2 (Shelly) CA container

| | DECAY (%) | SOFT FRUIT (%) | LENTICEL (%) | TOTAL DEFECTS (%) |
|---|---|---|---|---|
| FARM 2 (2025/26 | 0 | 19.2 | 75.3 | 94.5 |

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# CONCLUSIONS AND RESEARCH RECOMMENDATIONS

1. Mango quality in the orchard was not bad, with between 12 and 20% fruit is lost at this stage
2. PPECB rejections were also low at 1% or less
3. This means on farm quality of Mango fruit was modestly acceptable
4. Temperature management during handling and shipping was mostly acceptable

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# CONCLUSIONS AND RESEARCH RECOMMENDATIONS

5. Concern was fruit quality on arrival. Consignments monitored were rejected or heavily discounted in the market
6. The problem was soft “over mature” fruit, decay and lenticel spots

## FURTHER RESEARCH

1. There is scope to optimize CA storage of mangos

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# CONCLUSIONS AND RESEARCH RECOMMENDATIONS

2. There is opportunity to look at means to reduce fruit softening and over maturity during storage

   (a). Time temperature tolerance (TTT)

   (b). There is scope to optimize at storage temperatures

   (c). There is opportunity to relook at the use of ethylene inhibition as a means to slow down fruit maturation in storage

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# CONCLUSIONS continued…..

Maropeng in her PhD is investigating some of these factors

The PPECB would like to thank producers who have allowed us to do our trials on their farms, exporters who have shared fruit quality information

We appeal for your continued support as we continue with our trials

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# Thank you for your attention

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