

Report on SMGE 2016 season.

By
Peter Johnson



Acknowledgements

Funding support

- Australian Centre for International Agricultural Research (ACIAR)

Sindh Mango growers

Mr Mahmood Shah, Mr Humayoon Durrani, Mr Ghulam Sarwar Abro, Mr. Mazhar Abro, Mr. Junaid Hyder Shah, Mr. Zain-ul-Abdin Sayed, Dr Aftab Shah,

Tropical Direct

Mr. Nigel West,

Mr. Alex West

FESA

Ms. Laura Parnham

Mr. Luke Retchless

Table of Contents

Summary	4
2016 Season	4
Consignment details:.....	5
Container arrival.....	5
Fruit conditioning.....	6
Repacking:.....	6
Quality issues	7
Disease breakdown	7
Fruit blotches.....	7
Brush damage:.....	8
Internal breakdown.....	8
Fruit Dehydration	9
Internal browning:	10
Other Issues.....	10
Under skin browning	10
Fruit contamination	11
Fruit fly.....	11
Post shipment Saleable Life.....	11
Marketing.....	12
Recommendations	13
Technical.....	13
Marketing	13

Summary

2016 Season

The 2015 season presented itself as a make or break exercise, producers in Pakistan were still coming to terms with the impact of fruit fly on their systems and the Department of Plant Protection (DPP) was allowing this shipment effectively on a trial basis. In the past two seasons with Tesco's, variable quality fruit had been delivered to the stores due to poor post shipment handling practices. On top of that, the carton and post-harvest chemical issues still hadn't been fully resolved. The season overall went very well with the three most outstanding issues in the past correct post arrival condition, Disease management and carton performance being resolved.. However in order to commercial succeed there was a need to fully develop the existing customer base and bring new customers on board.

For the 2016 season 2 containers were sent Tesco being the cornerstone customer with the intent to develop supply chains with new supermarket and specialty fruit customers.

A number of issues arose during this season that had a dramatic impact on the result of the shipments. Changes of buyers with Tesco meant there was a loss of momentum with developing the line and sales were sluggish. The UK market as a whole saw a return to old ways with Pakistani fruit with vast volumes being sent mostly of very poor quality. This had a dramatic downward pressure on prices and new super market buyers were reluctant to commit to a program. This resulted in having to supply the wholesale markets to move some of the product.

Overall fruit quality was good with virtually no sapburn, disease levels below 1%, however fruit dehydration appeared to be a much greater issue this season than had been previously. Irregular sizing of the fruit combined with the supermarkets reluctance to move into single piece sale, created difficulties in repacking the product for the super markets, in order to meet the minimum weight requirements, significant amount of give-away weight was occurring.

Container conditions were not ideal with the oxygen levels not reaching the set point of the container for much of the duration the oxygen was around 13-15%. This significantly advanced the maturation of the fruit and would have had some contributing factor on the higher levels of dehydration that were experienced.

The season turned out to be a challenging one for SMGE, and highlighted one of the main issues that has not been addressed throughout the development that of a strategic market development plan.

Consignment details:

Container 1

Brand:	SMGE (Sindh Mango Growers and Exporters)		
Variety	Sindhri		
Harvest	June 6-7	Packing	June 6-8
Transport to Port	June 8	Depart Karachi	June 10
Type of transport:	Controlled Atmosphere Sea container Maersk.		
Arrive Felixstow:	July 2	Container Opened:	July 6
Conditioned:	July 6-9	Dispatched to supermarket	July 11-21

Container 2

Brand:	SMGE (Sindh Mango Growers and Exporters)		
Variety	Sindhri		
Harvest	June 11-12	Packing	June 12-13
Transport to Port	June 15	Depart Karachi	June 17
Type of transport:	Controlled Atmosphere Sea container Maersk.		
Arrive Felixstow:	July 9	Container Opened:	July 13
Conditioned:	Held conditioned prior to dispatch Dispatched to supermarket July 18 ++		

Container arrival

The log of container 1 indicated that the transit temperature remained close the set temperature and humidity was low to mid 90's, unfortunately the gas levels of this container were unavailable, although from the more advanced state of the fruit it is suspected that the O₂ was running high.

Container 2 humidity was significantly lower traveling around the mid 80's, temperature remained close to the set point. Oxygen levels remained high in this container around 12 - 15% not achieving anywhere near the set point of 3%. CO₂ levels remained around 5% which was within expectations. The higher O₂ levels appear to be an ongoing issue with the star care containers. Fruit exposed to the higher O₂ levels are noticeably more advanced in skin colour and softness with the second container averaging colour stage at 3.2 and softness at 2.3 both these are higher levels than would be expected if atmospheric conditions stabilised at the set points.

O2 & CO2				
2016-07-10				
Time	SetCO2	SetO2	CO2	O2
23:22	4.0	3.0	5.0	14.2
22:22	4.0	3.0	4.9	14.2
21:22	4.0	3.0	5.2	14.0
20:22	4.0	3.0	5.2	14.0
19:22	4.0	3.0	5.2	14.1
18:22	4.0	3.0	5.2	14.1
17:22	4.0	3.0	5.2	14.1
16:22	4.0	3.0	5.2	14.2
15:22	4.0	3.0	5.2	14.2

Figure 2 Extract from the container log clearly showing the elevated O₂ levels.

Fruit conditioning

Fruit condition on arrival was within expectations for CA fruit taking into consideration the container atmosphere conditions with high acid levels, pale internal colour and external skin colour around stage 3 to 4.

Pallets enough to complete the supermarket orders placed into the ripening room set at 20°C upon arrival whilst the remaining pallets were placed in a holding room at 12 °C.

Individual pallets were conditioned according to their colour development upon achieving approximately stage 5 (70 – 90% yellow) the pallets were then removed to the holding room. The rooms were vented regularly thus avoiding CO₂ build-up. The fruit originally placed into the holding room was rotated through the ripening room over the next 10 days. Most of the fruit required a minimum of 48 hours of conditioning at the 20 °C which progressed skin colour another 2 stages and a substantial drop in fruit acidity.

Generally the fruit conditioning process went well; however as some of the fruit was being sent to the wholesale markets, external colour became paramount, this lead to additional time being needed to fully degreen which contributed to further dehydration. Without the use of ethylene it is difficult to develop full colour uniformity in the trays quickly. Unfortunately on the wholesale markets the buyers are going to be making direct comparisons to airfreight fruit to leverage the price downwards.

Overall the conditioning process was well managed helping maximise the saleable life of the fruit.

Repacking:

The fruit was repacked into 1kg cartons, during this process the fruit was colour sorted so the green fruit was packed together so additional ripening time could be conducted with these cartons. The fruit sizing and variation within the cartons created some problems in order to meet the 1kg specification sometimes up to 1.2 kg of fruit had to be packed. Up to

15% of extra fruit was packed into the cartons effectively as a giveaway to the store this represents a significant cost to SMGE.

Quality issues

Disease breakdown

Disease levels this season were slightly higher than last year's results, but still within acceptable levels for sea freight, levels of less than 1% in the initial packing to 1 to 1.5 % in fruit that has been held longer. The primary disease was stem end rot however some rots associated with wounding were observed.

Overall the levels of disease control are extremely encouraging. Even after day 14 post shipment the incidence of disease on the remaining fruit was extremely low. This back up the results from last year's work suggesting that under this system disease is able to be managed well.



A fruit with stem end rot that has been graded out of a consignment

Fruit blotches:

A significant amount of fruit was observed developing a blotchy skin appearance, on some pallets there was up to 5% of the fruit affected. This is the first time that this has been observed and its cause is not certain. Possible causes are over brushing and or dirty brushes, the other could be related to the temperature and duration of the hot water fungicidal dip. Enough of this issue was seen for it to be of concern and follow up actions should be taken to identify the cause.



Fruit blotching

Brush damage:

A significant amount of fruit had noticeable brush damage. This occurs when the fruit is allowed to rotate on the brush units for a long duration. This is a breakdown of the quality control procedures in the shed and is completely preventable.



Bush damaged fruit

Internal breakdown.

Small levels of internal breakdown were observed, this is nutrition related, although with the levels observed it was not deemed to be a serious issue. However if not monitored in the orchard internal breakdown can become a serious issue.



Internal breakdown

Fruit Dehydration

Fruit dehydration resulting in a shrivelled skin appearance, both Pakistan varieties Sindhri and Chaunsa are particularly prone to this, low levels have always been observed in previous consignments.

The amounts in both containers this season was higher than previously seen with the second container exhibiting the highest amount, it was extremely variable between pallets figures between 1 to 5% being observed. Some pallets in container 2 being as high as 20% on arrival. As observed in previous seasons the smaller fruit appeared to be more susceptible. It appears to be the higher pulp to skin ratio on the smaller fruit is leading to the visible signs of dehydration.

With some pallets there was an obvious gradation from the top of the pallet to the bottom dehydration with the greatest occurring in the bottom layers.

It seems that there are a combination of issues that have occurred this season that have contributed to the higher level of dehydration.

- Smaller fruit being more susceptible to external symptoms
- Humidity in container 2 running too low.
- Time delays from processing the fruit in the packhouse and the cooling process.
- Inadequate cooling



Examples of fruit shrivelling.



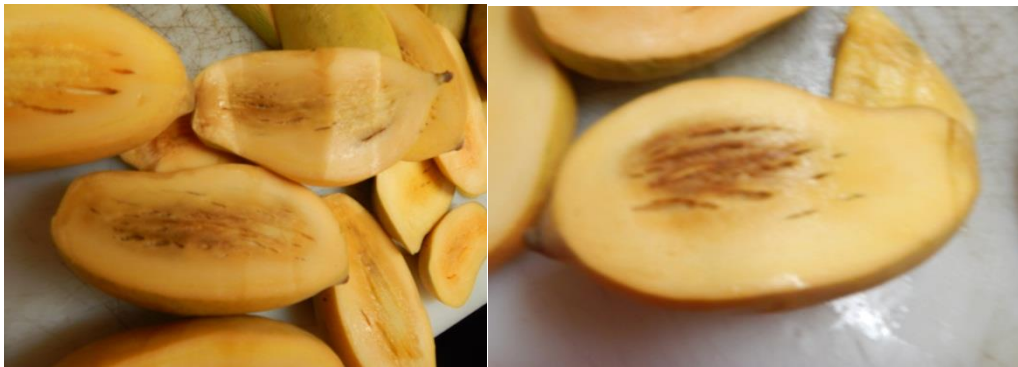
Severe Internal cracking of fruit

Flesh cracking (Fig 14) was observed in some fruit ranging from mild to moderate symptoms. This symptom has been observed on all consignments in previous years, it is not normally seen on other mango varieties. The causes are unknown but may be linked to fruit dehydration or premature ripening around the seed. Whilst it is still unclear the causes of this cracking the overall impact of this on the fruit saleability is minimal.

Internal browning:

One particular pallet experienced internal browning of the flesh. There were no external symptoms to indicate there was a problem. On further auditing of the fruit it appeared to be restricted to 2 pallets. These were consequently traced back to one farm.

Browning of this type has not been seen before in the Pakistani sea freight fruit. The exact cause of the browning has not been determined as yet. However there is most likely a temperature/time link. Browning of this type has been reported in other varieties of mangoes that have either been kept in cold storage for extended durations or excessive delays between harvest and the start of cold storage. The latter is a plausible explanation, however further investigation into this is required.



Internal flesh browning.

Other Issues



Appearance of Under skin browning

Under skin browning

Under skin browning was observed on a few pieces of fruit. Interestingly this has not been observed on previous sea shipments of Sindri. This disorder is a major issue with certain varieties such as Honey Gold from Australia and Banganpalli from India. Identifying the causes for this are part of an ongoing research program in Australia. Whilst the incidence of this was isolated to a few pieces of fruit and did not pose any problem with the consignment it is important to note as this could become a greater issue in the future.

Fruit contamination:

A few pieces of fruit arrived with writing on the skin; this issue was observed last season as well and is not acceptable. Grading and packing staff need to be informed to prevent this from happening.

Fruit fly

This is the second season that the systems approach has started to be implemented with SMGE . This result is consistent with all previous SMGE sea shipments where there has been nil detection in any consignments. Supporting the argument that CA sea freight export system poses minimal risk of fruit fly survival.

Post shipment Saleable Life

Fruit held up well on from arrival, with the slow sales it was important to get the maximum saleable life out of the fruit by day 7 post arrival noticeable dehydration starting to appear although eating quality was still very good and minimal disease break down occurred.



Fruit Day 1 on arrival.



Fruit after conditioning Day 7 post arrival.

Marketing

Meetings were held with potential new supermarket buyers, whilst they exhibited an interest in the fruit, they were not willing to run a trial with the fruit this season, as they had been receiving air freight consignments. Discussions were held around the potential market segment for sea freight fruit, whilst there was an agreement that the non-ethnic market had the most potential.

Meeting was held with a wholesaler in Birmingham who was keen to receive the fruit; this business had the capacity and experience to undertake fruit conditioning as they were also banana handlers. Their main customers were within the ethnic market segment. This company was keen to undertake the conditioning process themselves. Time was spent walking them thru the process of conditioning the sea freight mangoes. With their experience in banana they were very comfortable with post shipment conditioning protocols.

Further meetings were held with an importer in Liverpool this was aimed at creating new wholesale outlets for the fruit.

A number of issues arose this season, supermarkets tend to move their category managers around frequently, with seasonal suppliers this breaks up the continuity creating major issues in the development of the line. This is a frequent problem encountered with the UK supermarket system. To manage this it is essential to have a more varied customer base to date this has not been achieved thus leaving SMGE in the vulnerable position of having to put fruit on the wholesale market when their existing customer could not move the required volumes.

As with the previous seasons the target market for sea-freighted Sindhri mangoes was Tesco stores located in areas where there was a high ethnic (South Asian) demographic. Approximately 120 Tesco stores stocked Pakistan mangoes as part of their 'Exotic Foods'. The real opportunity that exists in the UK market is outside of this demographic segment however in order to do this the fruit will need to be marketed in a different manner i.e. not in the prepacked carton and different retail stores. In spite of pushing this for the past three seasons and demonstrating of its potential in store, it has not been able to gain any traction. Lack of being able to break into this segment has severely hampered the development of the sea freight line and to differentiate it from the poor quality air freight fruit on the wholesale markets.



Retail Display, in high end fruit retailer Slough

Recommendations

Technical

1. Training of packhouse staff on the hazards of brush damage.
2. Training of packhouse staff on fruit contamination prevention
3. Better temperature management programs within the packhouse to manage the dehydration, i.e. maximum times set the fruit can be allowed to sit on the packhouse floor before being put into the cool rooms.
4. Set humidity in containers at least 90%
5. Temperature monitoring within the chain to give a better understanding of where some of the issues are occurring i.e. internal browning and dehydration.
6. The instillation of sizing machines in the packhouse will resolve large number of issues particularly in reducing the giveaway.
7. Develop and trial store ready cartons that can be packed in Pakistan.

Marketing

It is very clear that the existing marketing strategy is not working and the viability of having only one major supermarket customer whose marketing strategy is not aligned with SMGE needs to be questioned. The Tesco strategy of restricting SMGE mangoes to stores in locations with a high south asian demographic is meeting their objective in expanding their offering in the ethnic foods range, it is not however exploiting the full potential of Pakistan mangoes in the UK market either in terms of volume or price.

Sea freighting Sindri to supply the ethnic market whether that is within the supermarket trade or wholesale market system is a high risk strategy as there is minimal margins in the chain and consumers are going to compare it to air freight chaunsa's.

The system that SMGE have developed delivers long shelf life, clean well-presented fruit, something that the airfreight Chaunsa has not been able to deliver. However to make this financially successful it must be differentiated from the airfreight market. The current non ethnic market of the UK is effectively only offered Florida type mangoes. This historically has been dictated by the supermarkets as the Florida varieties were able to meet their saleable life requirements. Currently there is nothing that resembles the yellow skin high brix mangoes of Asian origin offered to this market segment. When been able to test these varieties in the non-ethnic market the response has been overwhelming. There are good examples around the world where these types of varieties are able to make substantial inroads into the supermarket trade as in the US or dominated the trade as in Australia and New Zealand.

8. Before any further shipments are sent SMGE need to develop a full strategic marketing plan. This needs to be followed up with pre-season visits well in advance of shipments to meet with prospective buyers and undertake to get a commitment to develop new market segments.
9. The sales volume through the existing stores is insufficient to clear a sea container within a week. This is essential with a weekly shipping schedule, if an accumulation of stock, with its impact on storage facilities, is to be avoided. To prevent this situation will require
10. Organise a meeting with key supermarket buyers to see if a better strategy can be worked out with store allocations, presentation of product and promotion.

11. Continue to develop the relationship with some key wholesalers to provide an alternative marketing channel that can be used to manage weekly stock levels.
12. A new design for the retail box needs to be investigated as a matter of urgency. One that presents the fruit well and is tamper proof thus preventing customers from opening boxes to inspect the fruit causing damage.