

FEEDBACK ON THE 2012 FORELLE EARLY MARKET ACCESS PROGRAMME

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Introduction

Forelle is prone to mealiness and astringency if not cold stored for at least 12 weeks at -0.5°C . This mandatory storage period can result in a gap in the supply of bicolour pears to EU markets, resulting in buyers switching to fruit from other offshore competitors, a move that often remains permanent even when Forelle pears from South Africa become available. To combat this and to accommodate increasing volumes of Forelle, an urgent need has arisen for RSA Forelle to be available in Europe from week 15. This will also assist in smoothing out the peak and maintaining a supply of consistently high quality fruit. The objective of this initiative was to reduce the mandatory 12 week cold storage period following Forelle harvest and enable availability of acceptable eating quality South African Forelle pears in Europe from week 15, after only 4 to 6 weeks cold storage.



In 2011, five containers of early season Forelle were exported to Europe, where samples were examined offshore by ExperiCo, and further samples subjected to consumer taste tests in the UK and Germany. The results of this study were published in a recent issue of this Journal (Crouch and Bergman, 2012). The main message from the consumer feedback was to target markets that preferred a crisper fruit, and to visibly market the fruit accordingly. Following the positive market response from this trial, the Forelle Producers Association (FPA) increased this programme to 10% of exportable Forelle/Vermont Beauty in 2012, resulting in over 300 000 cartons being exported across Europe, the Far East, Middle East, North America and Canada. ExperiCo was tasked to co-ordinate orchard release in co-operation with Hortec®; monitor holdback samples sourced from as many participating orchards as possible, and get market feedback from the Middle East and UK markets.

The success of the Forelle Early Market Access (FEMA) programme was largely attributed to strict guidelines and controls being adhered to, ensuring that only fruit of correct harvest maturity and acceptable eating quality arrived in offshore markets, in compliance with the initial research recommendations.

Methodology

To qualify for the FEMA programme, participating Forelle orchards were closely monitored until a minimum harvest criteria was reached, at which time orchards were released by Hortec®. This was typically at least 2 to 3 weeks past the commercial harvest date, allowing the fruit to attain an acceptable eating quality on the tree, with sugar levels above 14%, flesh firmness targeted between 6.0 and 5.5 kg, and no astringency. Harvested fruit were then subjected to a SmartFreshSM application to prevent ripening, thereby enabling the earlier marketing of a crisp, but sweet and juicy fruit.

Whenever available, samples from as many orchards as possible were collected from pack houses following SmartFreshSM application and subjected to the following analyses or tests:

- SmartFreshSM efficacy
- Fruit maturity at time of harvest and packing
- Ripening and mealiness prediction model
- Fruit quality of pears packed for export after 4 weeks cold storage at -0.5°C
- Fruit quality of pears packed for export after 4 weeks cold storage at -0.5°C plus a shelf-life period of 7 days at 20°C
- Assessment for astringency throughout the above sampling stages by taste panel

Individual data from these examinations is available to participants of the 2012 programme from Jacques du Preez, the Hortgro production manager (jacques@hortgro.co.za). Only the harvest maturity standards and the validation of the mealiness prediction model will be discussed in this report. Fruit were also assessed in Dubai and the United Kingdom, and meetings held with distributors and supermarket chains. This article will relay market sentiments expressed at these meetings and report on feedback received by South African exporters from their offshore agents.

Assessment of the FEMA harvest maturity standards

From previous research (Crouch and Bergman, 2010) it was determined that the minimum acceptable release criteria for Forelle pears harvested for the FEMA Programme should be:

Flesh firmness between 6.0 and 5.5 kg

Total Soluble Solids (TSS) of at least 14%

Titrateable Acidity 0.25% to 0.20% (malic acid equivalents)

Ground skin colour 2.3 to 3.0 (SA Colour chart for green apples and pears)

Orchard samples submitted to Hortec® maturity laboratories in Ceres and Elgin at the time of harvest release were analysed to determine compliance to the release criteria (Table 1). It was found that the means for all parameters examined were, in general, close to the minimum FEMA standards. However, although flesh firmness measurements indicated that only 26.1% of samples tested were within the release criterion of 5.5 to 6.0 kg, almost 60% of samples were 6.1 kg or less. Skin ground colour compared favourably with the release criteria, with 97.3% compliance noted. Total soluble solid content indicated 85% compliance. Although only 18.9% of samples complied with the acid content recommendation of between 0.20 and 0.25%, only 3.6% of samples were above 0.30%. Similar trends were noted when the different production areas were examined separately, although the Elgin and Vyeboom samples showed slightly lower compliance across all parameters, compared to Ceres and Langkloof samples (Table 2).

Table 1 : Orchard samples taken at the time of harvest across areas

Parameter Target	Mean	Min	Max	Frequency	Percentage of valid	% below target	% on target	% above target
Firmness (kg) 6.0 – 5.5	6.1	5.4	6.7	5.5 < x ≤ 6.0 5.5 < x ≤ 6.1	26.1 57.6	0.9	26.1	73.0
Skin Ground Colour ≤ 3.0	2.4	1.6	3.1	2.0 < x ≤ 2.5 2.5 < x ≤ 3.0	58.6 35.1	–	97.3	2.7
TSS (%) > 14.0	14.5	11.1	16.3	14.0 < x ≤ 15.0 15.0 < x > 16.0	62.2 22.5	15.3	84.7	–
Acidity (%) 0.20 – 0.25	0.19	0.12	0.31	0.20 < x ≤ 0.25 0.30 < x > 0.35	18.9 3.6	60.3	18.9	13.5

Table 2 : Orchard samples taken at the time of harvest from Elgin and Vyeboom, Ceres and Langkloof

Parameter	Target	Mean	Min	Max	% below target	% on target	% above target
Elgin and Vyeboom (39 samples)							
Firmness (kg)	6.0 – 5.5	6.1	5.7	6.7	0	20.5	79.5
Skin Ground Colour	≤ 3.0	2.5	1.6	3.5	–	97.4	2.6
TSS (%)	> 14.0	14.1	11.1	15.4	23.1	76.9	–
Acidity (%)	0.20 – 0.25	0.18	0.12	0.30	66.7	25.6	7.7
Ceres (82 samples)							
Firmness (kg)	6.0 – 5.5	6.0	5.4	6.7	1.6	31.3	67.2
Skin Ground Colour	≤ 3.0	2.3	2.1	3.0	–	98.4	1.6
TSS (%)	> 14.0	14.7	12.0	16.3	12.5	87.5	–
Acidity (%)	0.20 – 0.25	0.19	0.12	0.31	64.1	17.2	18.8
Langkloof (9 samples)							
Firmness (kg)	6.0 – 5.5	6.0	5.8	6.2	0.0	12.5	87.5
Skin Ground Colour	≤ 3.0	2.7	2.5	3.0	–	87.5	12.5
TSS (%)	> 14.0	14.7	14.0	16.2	0.0	100.0	–

All samples were assessed for astringency at packing, and although 22% of the samples indicated some degree of astringency, this could not be correlated to any of the maturity parameters measured and was also noted across regions. Mealiness was only noted in one sample after storage and so the use of SmartFreshSM to delay ripening, effectively prevented the occurrence of this disorder as intended.

Recommended changes to FEMA harvest maturity standards

Positive market feedback from offshore distributors indicated that the FEMA, “Crisp and Sweet” brand of Forelle pear was a success. Data from samples sourced from the orchards and at time of packing indicated, however, that the majority of orchards did not meet the flesh firmness release criteria. All orchards however, were harvested at least 2 to 3 weeks after the standard release date. If one includes fruit harvested at 6.1 kg, then the majority of orchards would be represented. An orchard release criterion for fruit not participating in the FEMA programme, i.e. standard maturity, is a maximum flesh firmness of 6.8 kg, with a 20% tolerance above this value. An orchard is deemed to be at optimum picking maturity at an average flesh firmness of 6.3 kg. If the flesh firmness criterion for FEMA orchards is relaxed to a higher value above 6.0 kg, these orchards may well be harvested earlier, resulting in astringent fruit that could compromise the FEMA Programme. Acid content was assessed but not used as a single determining factor in releasing orchards. It is suggested that this standard be changed to limit the harvesting of orchards with acid values above 0.30% malic acid equivalents.

The following harvest maturity release criteria are recommended for Forelle orchards participating in the 2013 programme:

1. Flesh firmness remain at 5.5 kg to 6.0 kg
2. Total soluble solid above 14%
3. Titratable malic acid equivalents below 0.30%
4. Skin ground colour to not exceed 3.0 on SA Colour Chart for green apples and pears
5. No astringency

Release Maturity:

Orchards not meeting the flesh firmness release criteria 2 to 3 weeks after the standard release date may be released if firmness does not exceed 6.3 kg, TSS values are above 14%, skin ground colour does not exceed 3.0, and most importantly, if the fruit are of acceptable eating quality and not astringent. The final decision for release in 2013 will still lie with Hortec®, in collaboration with **ExperiCo**, who will look at all these factors when releasing an orchard.

Assessment of the mealiness prediction test

SmartFreshSM treated fruit were subjected to a prediction test to assess the ripening potential, and in particular, mealiness development, that could be expected after 12 weeks of cold storage followed by a shelf-test. This information would prove useful should the fruit not be marketed immediately, and storage for periods longer than 6 weeks be required. Data collated from over 130 orchards indicated that, in nearly all of the cases studied, no mealiness developed. This result was confirmed by the prediction test and also to some extent the efficacy test. The prediction test gave a good indication of flesh firmness after storage and could possibly be further developed to include prediction of astringency levels. The main drawback of this test at present, is that a result is only known at roughly the same time as the fruit arrive at the offshore destination.

Feedback from offshore markets

In early June, www.freshplaza.com published an article by Randolf Aaldijk of Origin Fruit Direct headed, "Forelle six weeks earlier because of SmartFreshSM". The article referred to the season starting a few weeks earlier than last year because "South Africa is experimenting with a SmartFreshSM treatment". Aaldijk, who confirmed that Forelle are normally subjected to a mandatory storage period after picking, said that after SmartFreshSM application, fruit are exported immediately. According to Aaldijk, this was an interesting development as the pears arrived about 6 weeks earlier and there was no longer be a 'gap' between supplies of Rosemarie and Forelle making it easier to arrange programs with supermarkets. "It is a test, but I expect this will develop enormously in the coming years and as a result the season can be extended." he said. The article was accompanied by several pictures of Forelle pears sporting the new "Crisp and Sweet" label.

Mark Jensen from SAFPRO provided some excellent market feedback on the FEMA programme. He also emphasised the strategic benefit of the early market access of Forelle.

"We had very good comments from retailers saying that on this basis they could now run "bi-coloured" programs from Rosemarie without stopping and losing market momentum, opening up potentially an extra 6 weeks of marketing."

Middle East and the United Kingdom

The above comments echoed many of the sentiments expressed by client feedback from the East and the UK. A meeting with Kibsons International in Dubai, one of the largest importers of fresh produce to the UAE, confirmed that consumers in the Middle East prefer a crisper, sweeter pear - especially because of the very hot climate. They received no complaints from the earlier marketed Forelle and indicated that they would like to grow the programme in the future. Meetings were also held in the United Kingdom with Chingford Fruit, Worldwide Fruit, and Mack Multiples, where samples of FEMA fruit were made available for examination and tasting. All fruit sampled looked aesthetically



attractive with the contrasting green and red blush and were of exceptional eating quality. Although the pear season had got off to a slow start because of cooler weather, no complaints of astringent or mealy fruit had been received at the time of the visit. Some consumers had complained of fruit that did not ripen which again emphasised the importance of labelling the fruit with the correct message and targeting the correct markets. The use of in-store promotions and clearly visible signage would aid in getting this message across. Dr Theresa Huxley from Sainsburys expressed some concern about the transition between the early “Crisp and Sweet” Forelle and the standard fruit marketed as “Sweet and Juicy”, which again emphasised the importance of continued market feedback and dialogue between exporters and marketers. The general consensus across distributors was that this programme should be continued and volumes increased in coming years.



Europe

Market feedback was also received via correspondence from South African exporters and their offshore clients. Randolf Aaldijk from the Netherlands also had this to say about the shipments that they received:

“Based on the condition and quality of the fruit upon arrival, we can clearly state that the treatment with SmartFreshSM was absolutely no problem and even a success. The better freshness and more shiny appearance definitely helped to create a good market with the right prices. Not only the better quality, but also the earlier arrival helped create more blushed pear programme into the major European retailers without the normal gap of arrivals between Rosemarie and Forelle. More retail will reserve space because of this. We see that we can be more competitive towards the Chileans because of the earlier arrivals of SmartFreshSM Forelle, and again because we see no gap between the arrivals of the different varieties”.

Feedback from Del Monte in Germany remarked on the overall good quality of the fruit on arrival and the fact that there was absolutely no waste. Texture and firmness were rated as very good, appearance as very fresh, and taste as sweet, rich and moderately juicy. Customer reaction was positive with no claims reported. Cobana Fruchtring, also in Germany, participated in the FEMA programme with the objective of benefiting from the lack of availability of blushed pears since March. The programme worked very well commercially, when the shipping containers arrived in an empty market and fruit achieved good sales prices. This was in part because Chilean shipments with Forelle only reached Europe 2 to 3 weeks later! Cobana Fruchtring saw a further advantage to the programme in that total Forelle volume out of RSA could be stretched over a longer period avoiding peaks of arrival that create pressure on the markets. Again no quality problems were observed due to the earlier shipments and no claims or negative comments received, even after three weeks of cold storage in the Netherlands.

Far East

Although only small volumes of early Forelle were sent to the Far East in 2012, the containers of Forelle received under the FEMA Programme were very well received. Fruit were reported as having an attractive blush colour and a creamy sweet flavour once ripened. Customers were very happy with the pears and look forward to further arrivals in coming years.

Benefits of the FEMA Programme

With a successful season behind us, the benefits of the FEMA programme become all that more evident. The advantage of a longer picking window was particularly noticeable on the increased fruit size and reduced levels of astringency in the fruit. Larger fruit size equates to more cartons. Allowing early entry of fruit into the offshore markets also resulted in less pressure to harvest early for the normal protocol Forelle, further reducing the risk of astringency. Care must, however, be taken to ensure that orchards harvested for the standard protocol are of an acceptable quality for medium to long term storage. The application of SmartFreshSM effectively delayed fruit softening and hence prevented the development of mealiness. The fruit also exhibited a fresh, enticing external appearance. The higher sugar levels improved the taste of the fruit, resulting in the potential for FEMA to become the preferred source of good tasting Forelle pears. This, along with the added advantages of bicolour pear continuity, the smoothing of marketing peaks and storage flexibility - FEMA fruit can be stored under RA storage for 16 weeks should the market demand be flat, - certainly added to the profitability of this cultivar for South African producers.

Impact of the FEMA Programme on standard protocol Forelle and Vermont Beauty

While a positive response was received for fruit exported through the FEMA programme, feedback from certain South African exporters has raised an area of concern regarding fruit originally destined for the early programme, but which was then harvested prior to the FEMA release date and stored under the standard 12 week protocol. In some cases, these fruit were harvested because they did not make the minimum flesh firmness release. However, the delayed harvest had the negative effect of advancing skin ground colour, and also evidently resulted in an increase in both the incidence and severity of watercore during storage. Watercore is caused by a leakage of cell sap into the intercellular spaces, following an abnormally rapid conversion of starch to sugar. Although the most influential factor is maturity, other pre-disposing factors include inadequate orchard nutrition, heavy or ill-timed pruning and the alternation of hot days with cold nights (Snowden, 1990). It is thought that watercore may be directly linked to increased levels of internal flesh browning during extended storage durations. Offshore markets preferring a firmer and greener fruit, such as the Middle and Far East and Russia, were in some instances disappointed in the quality of fruit that arrived after the FEMA programme. This was particularly true for Vermont Beauty, which is marketed as a green pear alongside Williams Bon Chretien, and which in some consignments experienced poor quality due to advanced skin colour and low flesh firmness's.

South African Marketing Strategy – the way forward

Making this a successful programme is still all about managing risks. Not only for Forelle or Vermont Beauty destined for early market access, but also for orchards that fall into the standard 12 week storage protocol. Probably the single most important risk for the FEMA programme is that producers do not adhere to the correct protocols and so compromise the programme by picking too early, resulting in fruit with increased astringency and unacceptable eating quality. Fruit should be harvested as close to eating ripe as possible, with ground skin colour not exceeding a score of 3.0 on the industry colour chart for green apples and pears. The perception that yellower fruit will ripen too quickly and not have sufficient shelf-life will need to be rectified through correct information transfer to supermarkets and retailers. There is also the risk of fruit slipping through the system that have not been subjected to SmartFreshSM, resulting in fruit offshore with a high mealiness potential, especially if stored for less than 12 weeks. Anyone found compromising the programme should lose the privilege of participating in this programme in the future.

Previous studies indicated that certain markets prefer a soft and juicy pear. It is therefore important to discourage those shoppers who prefer a softer pear from eating a fruit that they would not enjoy. The use of the new “Crisp and Sweet” PLU label effectively brings across this message, but could be further expanded to “in-store” promotions, and larger signage especially on pre-packs, and on box-ends. This risk could be further managed by sending the fruit to target markets where consumers prefer a firmer, crisper pear. Certain issues around the use of the PLU label still need to be addressed, in particular where countries have particular language or barcode requirements.



Further market feedback is still required from the Far East, Russia, North America and Canada, where volumes are continuing to grow. More information is also needed in relation to the crossover between FEMA fruit and the standard commercial Forelle, when “Crisp and Sweet” makes a transition to “Soft and Juicy”.

The Forelle / Vermont Beauty cultivar as a whole needs to be protected, which emphasises the importance of maintaining the excellent reputation that South Africa has for good quality fruit of exceptional eating quality. In this regard, it is essential that producers do not compromise their orchards by harvesting too late for the standard “Soft and Juicy” programme. To manage this, it is important to select FEMA orchards as soon as possible, and then commit these to the early programme. There have been suggestions that FEMA fruit should be released on the merit of their

eating quality at harvest and not by using flesh firmness as the main maturity parameter. The merits of this point will certainly be taken into consideration during the 2013 season, but will pose a challenge since taste remains a highly subjective parameter which precludes it from being a maturity indexing variate.

This season has seen the identification of many suitable target markets and retail partners. Strategies to sell or keep surplus fruit that did not make the export grade have been established. The Forelle Producers Association has indicated that through the success of the 2012 programme, volumes will be further increased. Dispensation will again be required for export, and again, continued feedback from retailers and supermarkets regarding consumer acceptance and/or complaints is essential in minimizing and managing unforeseen risks.

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