

Learning exotic ways

Persimmon, or Sharon Fruit, is an ancient delicacy that only recently found its way to South African orchards and taste buds. New research is shedding light on how this fruit should be handled.



1 A close-up of a young, developing persimmon.

WHEN IS THE BEST TIME to pick 'Triumph' persimmons, marketed as Sharon Fruit, in order to maximise export potential? Should the fruit on the tree be light yellow or deep orange? How does the fruit respond to storage at different levels of maturity?

Knowing the answers to these questions is important in ensuring Sharon Fruit from South Africa reach their destination markets in the best possible condition. But, given that persimmons have been cultivated locally for less than two decades, there

is much we don't know about them yet. One such unknown is the post-harvest quality of the fruit.

Given the great distances involved in the export industry, it is imperative that the fruit be stored and packaged under optimum conditions. At the moment, the fruit is often spoilt when it arrives at its export destination. Incorrect storage and handling practices result in excessive water loss, a decrease of total soluble solids (TSS) – which is an indication of sugars present in the fruit – loss of vitamin C and a decrease in firmness. When spoils occur, the fruit has to be repackaged at the export destination – with the farmer in South Africa responsible for the cost.

Such losses and their financial and reputational impacts gave rise to a study into the maturity development, storage and shelf life of persimmons. The research project was a collaboration between the Sharon Growers Group and the Department of Horticultural Science at Stellenbosch University (SU). The SU project leader was Dr Elke Crouch who, together with Dr Wiehann Steyn, supervised the Master's student, Pesanai Zanamwe, who did the research. The project coordinator was Ferdie Ungerer, a former technical manager of the Sharon Growers Group.

PICK YOUR PICKING TIME

Mr Ungerer explains that the harvesting season of Sharon Fruit stretches from the first week of April in the earlier regions to the first week of June in the late regions. Two parameters determine maturity, namely colour and firmness of the fruit.

The research project entailed three trials over a three-year period during which Cultar-treated and untreated fruit were harvested from both early and late orchards. Cultar is an agrochemical that controls vegetative growth in fruit trees.



PERSIMMONS IN SOUTH AFRICA

Although persimmons have been enjoyed in countries such as China and Japan since ancient times, it has only been commercially cultivated in South Africa since 1998. Here, they are still regarded as an exotic fruit and many South Africans are yet to taste one.

Currently, more or less 400ha of persimmons are under cultivation in the Western Cape. This yields an annual harvest of between 5 000 and 6 000 tons of fruit, of which 1 000 tons are sold locally. Most of the fruit is destined for export markets, the largest being Germany. South Africa also exports persimmons to other European countries, Singapore, Canada, Thailand and Malaysia.



PROJECT TITLE
Reducing post-harvest losses of 'Triumph' persimmons

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DURATION
Two years

PHI-2 CONTRIBUTION
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LEAD INSTITUTION
Stellenbosch University (Department of Horticultural Science) and the Sharon Growers Group

BENEFICIARY
The persimmon industry

FOCUS AREA
Post-harvest physiology and non-destructive fruit quality assessment techniques

HUMAN CAPITAL DEVELOPMENT
One MSc student

PRESENTATIONS AND PAPERS DELIVERED
Three





Persimmons are an everyday part of the Chinese diet and farmers there grow them solely for local use.

The objectives were to:

- Determine the production window that yields fruit that store better.
- Establish stages of maturity, using a colour chart, in order to harvest Cultar-induced early, naturally early and naturally late crops without affecting post-harvest life.
- Establish the effectiveness of Sinclair and near-infrared (NIR) technology as non-destructive sorting tools.

Four early and four late orchards, as well as four orchards treated with Cultar were surveyed. Fruit was harvested in four colour groups of maturity. Group 1 fell in the colour chart value 2 (dark orange, very ripe);

group 2 in colour chart value 3 – 4 (lighter orange); group 3 in chart value 5 – 6 (dark yellow) and group 4 in colour chart value 7 (very light yellow, just ripe).

Size and weight measurements were taken by electronic balance and a diameter-electronic calliper, while firmness was determined by using a plunger. The NIR and Sinclair measurements were taken in the same positions as those for firmness. Soft fruit percentage was determined by finger pressing and fruit damage was visually assessed.

The fruit was assessed at harvest, after six-and-a-half weeks of storage at -0,5°C, after four weeks at 20°C and during simulated shelf life. The results were correlated with colour charts.



TRY THEM – THEY'RE GOOD FOR YOU

Persimmon is considered a nutraceutical* fruit because it contains high concentrations of carotenoids and polyphenols. Humans get carotenoids only from food and we need them for their antioxidant powers.

Research furthermore suggests that persimmons can help reduce high blood pressure and that they have antibacterial effects.

For more information on persimmons, visit www.sharon-fruit.com.

*The word nutraceutical is a combination of 'nutrition' and 'pharmaceutical' and refers to food or food products that provide health and medical benefits, including the prevention and treatment of disease.

THE RESULTS

It was found that in late regions the fruit firmness, soft fruit percentage, TSS and titratable acidity (TA) were better than in Cultar-treated early regions.

Darker fruit (in colour group 2) were softer and had more visible damage than fruit harvested in the slightly lighter and less ripe group (colour group 3).

In colour group 2, Cultar-treated fruit had more external damage after storage than those in colour group 3. Damage in group 2 exceeded acceptable export standards.

The results were clear: the post-harvest quality of the fruit from all regions is improved when they are harvested at a less mature stage in colour group 3 (colour chart index 5 – 6), when the fruit is still light in colour and the TSS is above the minimum export standard of 14%.

As far as NIR technology as a sorting tool is concerned, the study found that it could be used to non-destructively measure TSS but not firmness. Further studies should refine the potential of NIRs to grade 'Triumph' persimmons into distinctive TSS and fruit colour ranges. 🍊



WHEN THEY BLOW IN THE WIND

Persimmons are sensitive fruit that do not like strong winds. Windy conditions stress the fruit, causing them to produce ethylene which can lead to premature ripening. The fruit may, on the surface, seem to be in perfect condition but on the inside may already be softening – leading to shorter shelf life.

Growing as they do in the Western Cape, persimmons are occasionally subjected to the destructive force of the region's north-westerly wind.

"In view of these facts, we ran a second study alongside the maturity assessment trials to determine exactly how wind damages the persimmon industry," says Ferdie Ungerer.

The study employed four different ways of simulating the impact of wind. First, a spray machine blower was aimed at the fruit for five minutes at a time. Secondly, because wind strips leaves from trees, half the leaves of the tree sample were removed manually. The third method was to manually turn the fruit while they were still on the tree. Finally, trees were manually shaken for two minutes at a time.

The study found that wind did not affect the firmness of the fruit. However, defoliation and turning of stalks resulted in increased softening during storage. Colour development was increased during shelf life in the fruit of which the stalks were turned and where a wind blower was used. The TA was not affected by the wind.

"We will be sending the results to the technical guys at the storage facilities at Buffelsjag in Swellendam and Franschoek," says Mr Ungerer. "They will pass on the information to the different farmers. It will then be up to the individual Sharon Fruit growers of the Western Cape to use the information and take the necessary steps to minimise losses."



The post-harvest quality of the fruit from all regions is improved when they are harvested at a less mature stage, when the fruit is still light in colour.



1 Pesanai Zanamwe, Dr Elke Crouch and Ferdie Ungerer show the colour chart that can be used during persimmon harvesting.

2 Pesanai Zanamwe, Master's student at the Department of Horticultural Science at Stellenbosch, uses NIR technology to detect the grade of ripeness of persimmons.