

Litchi cultivar evaluation – 2018/19 season

In 1992 a cultivar evaluation programme was established in an effort to determine the performance of both local and imported litchi cultivars. A breeding programme was also initiated to supplement the cultivar evaluation programme. Eight orchard blocks of selections or promising selections were evaluated during 2018/19.

Andani Mabirimisa and Arthur Sippel

AGRICULTURAL RESEARCH COUNCIL – TROPICAL AND SUBTROPICAL CROPS

THROUGHOUT THE YEARS, several characteristics were taken into consideration for selection of local litchi cultivars. These included high yield, large fruit, skin colour, texture and flavour (Froneman & Rheeder, 2000) and are important considerations in terms of variety development and consumer acceptance. There is a need for an increased number of new early and late season varieties.

The evaluation programme is conducted at the Agricultural Research Council – Tropical and Subtropical Crops’ (ARC-TSC) Nelspruit campus. Multiple orchards were

monitored and evaluations on early and late fruiting selections were conducted on several fruit characteristics, such as fruit size, seed size and fruit quality – both internal and external.

Phase 1 blocks consist of hybrid selections and Phase 2 blocks comprise promising selections that are multiplied for further evaluation. A total of five Phase 1 and three Phase 2 orchard blocks were evaluated during the 2018/19 season. ‘Mauritius’, ‘Fay Zee Siu’ and ‘Wai Chee’ were used as standards. Data were collected for in-field description and laboratory

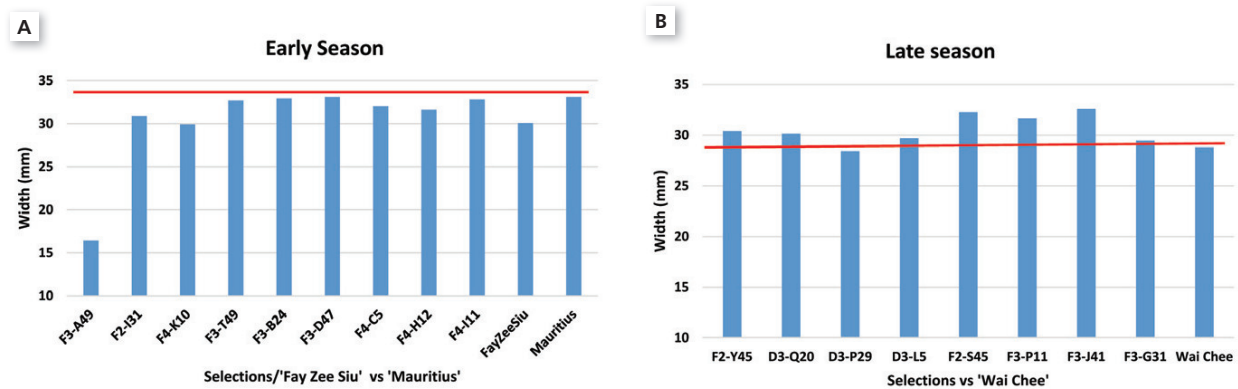


Figure 1. Mean width of early (A) and late (B) season selections compared with ‘Mauritius’ and ‘Wai Chee’, respectively, during the 2018/19 litchi evaluation season.

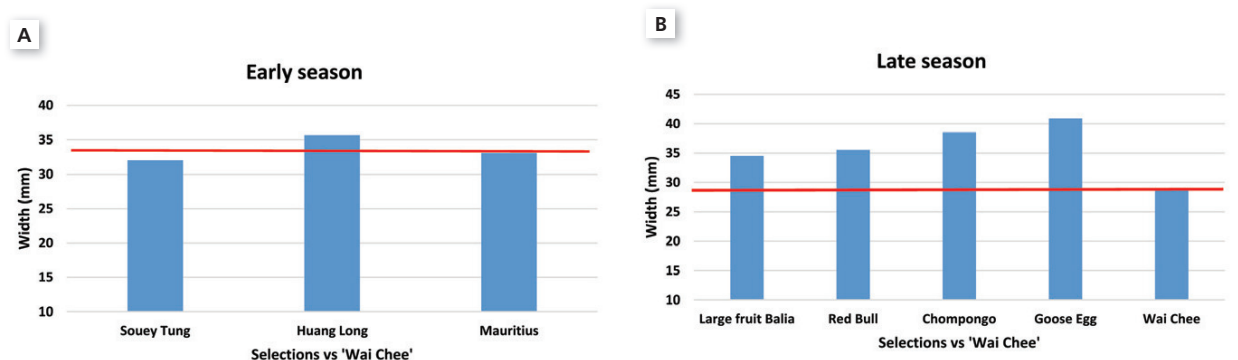
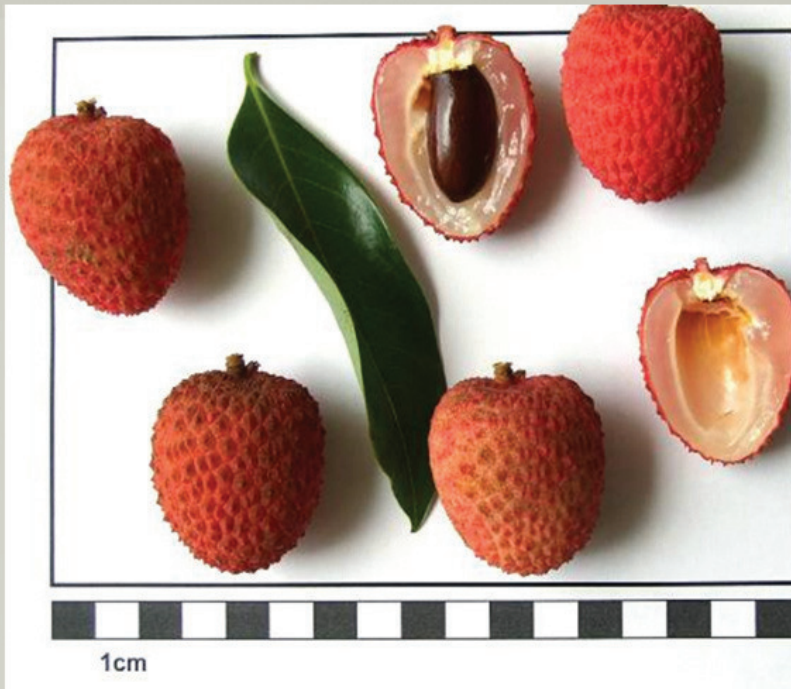


Figure 2. Mean width of early (A) and late (B) season imported cultivars compared with ‘Mauritius’ and ‘Wai Chee’ during the 2018/19 litchi evaluation season.

'TS-LIT-049'



PARENTS: MAURITIUS
HARVEST: MID (-1)
AREA: MBOMBELA

FRUIT SIZE:
 *LENGTH – 41mm
 *WIDTH 1 – 37mm
 *WIDTH 2 – 35mm
 *MASS – 30g

COMPOSITION:
 ARIL: 77%
 SKIN: 13%
 SEED: 10%

REMARKS:
 Large fruit. Good quality. Pointed shape.

Figure 3. Fruit of the recently PBR registered cultivar TS-LIT-049.

analyses (TSS, mass, length and width) were performed on all the promising selections.

Phase 1 evaluations

Selections that were early were identified and evaluated. The first harvest of the season came from selection F3-A49 (16,46 mm and 14,78 g) which was harvested five weeks prior to the 'Mauritius' harvest. All of the harvested fruit samples had chicken tongue seeds (seeds partially developed due to pollination failure). However, fruit of this selection was very small in comparison with 'Mauritius' (Figure 1a).

Selections F3-T49 and F3-B24 were harvested two weeks before 'Mauritius' and were both almost the same size as 'Mauritius'. More than 50% of the sampled fruit had chicken tongue seeds. Another selection that performed well during the 2018/19 early season, was F3-D47, which had uniform skin colour, the same fruit size as 'Mauritius' and was harvested one week earlier than 'Mauritius'.

During the late season, the selection F2-S45 was harvested three weeks before 'Wai Chee'. This selection was larger in size, with uniform skin colour and medium seed size compared with 'Wai Chee' (Figure 1b). Selection F3-J41 was also three weeks earlier than 'Wai Chee', with 80% of the sampled fruits having chicken tongue seeds, and also being larger than 'Wai Chee' in size with smooth fruit skin texture.

Phase 2 evaluations

The Phase 2 evaluation block consists of recently imported material. Only two of the imported cultivars qualified for early season evaluation, these being 'Hung Long' and 'Souey

Tung'. 'Hung Long' was larger than 'Mauritius' in width and mass, with a mean mass of 28,31 g compared to the 25,77 g of 'Mauritius' (Figure 2a). 'Hung Long' fruit width was 35,67 mm which exceeded 'Mauritius' fruit width of 33,11 mm. 'Souey Tung' fruit width was 32,03 mm and fruit mass 18,64 g, which were smaller than those of 'Mauritius'.

For the late season, 'Goose Egg', 'Large Fruit Balia', 'Red Bull' and 'Chompogo' were harvested during the same week as 'Wai Chee' (Figure 2b). The size of all late season imported cultivars was larger than that of 'Wai Chee', with 'Goose Egg' and 'Chompogo' being the largest. 'Chompogo' was also characterised by a thick skin.

RECENT PLANT BREEDERS' RIGHTS REGISTRATION

Recently, one of the Friedenheim selections was awarded plant breeders' rights under the cultivar name 'TS-LIT-049' (Figure 3). The average fruit mass of the standard 'Mauritius' fruit is 23 g, whereas 'TS-LIT-049', producing fruit during the same period as 'Mauritius', yields fruit that is on average 30 g.

Whereas 'Mauritius' fruit is oval-shaped and dull red in colour, the 'TS-LIT-049' is more heart-shaped with a bright red skin colour. Very few other cultivars available in the market match the size of 'TS-LIT-049'. It therefore has the potential to ensure a better return on investment for the producer as larger fruit often sells at a premium price.

REFERENCE

FRONEMAN, I.J. & RHEEDER, S. 2000. New high potential litchi hybrids developed by the ARC-ITSC. SALGA Yearb. 11: 7-11. 