

Maturity Patterns of Sugarcane Varieties Introduced by Sugarcane Research Institute



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Results of the studies of maturity patterns of sugarcane varieties introduced by Sugarcane Research Institute (SRI) from 1984-2017 are presented in this document with the dates of planting and harvesting, and variation of pure obtainable cane sugar (POCS) with the age of the crop in different series of the varieties. Maturity Patterns of the varieties are useful to schedule the planting and harvesting times of the crop of each variety to maximize the genetic ability of accumulation of sucrose in SRI-developed varieties.

Varieties evaluated and released up to SL 94 series

Varieties that have been released for commercial cultivation and some of the near-commercial promising varieties in the series of 90, 92, 93, and 94 evaluated up to Replicated Yield Trials (RYT) were used for the experiments of maturity studies under irrigated and rain-fed conditions in 2006 at SRI research farm as follows:

Location: SRI research farm

Crop status: Plant crop

Water regime: Irrigated crop

DOP (Date of planting): 01/06/2006

Juice analysis: From 11-13 months age

Standard variety: Co 775

Varieties SL7103, SL8306, SL88116, SL891673, SL92 4997, SL92 5588, and SLI121 showed comparatively higher POCS (12%) than other varieties (Figure 1).

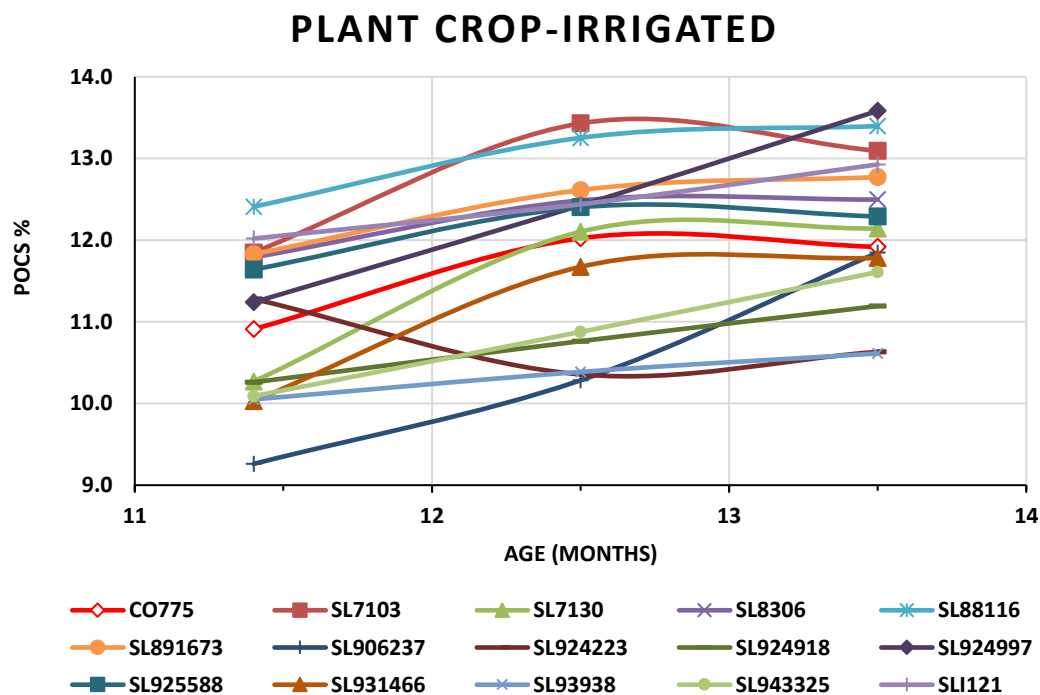


Figure 1 Variation of POCS % with the age of the varieties evaluated under irrigated conditions in *Yala* season 2006



Location: SRI research farm

Crop status: Plant crop

Water regime: Rain-fed

DOP: 05/04/2006

Juice analysis: From 13-16 months age

Standard variety: Co 775

PLANT CROP-RAINFED

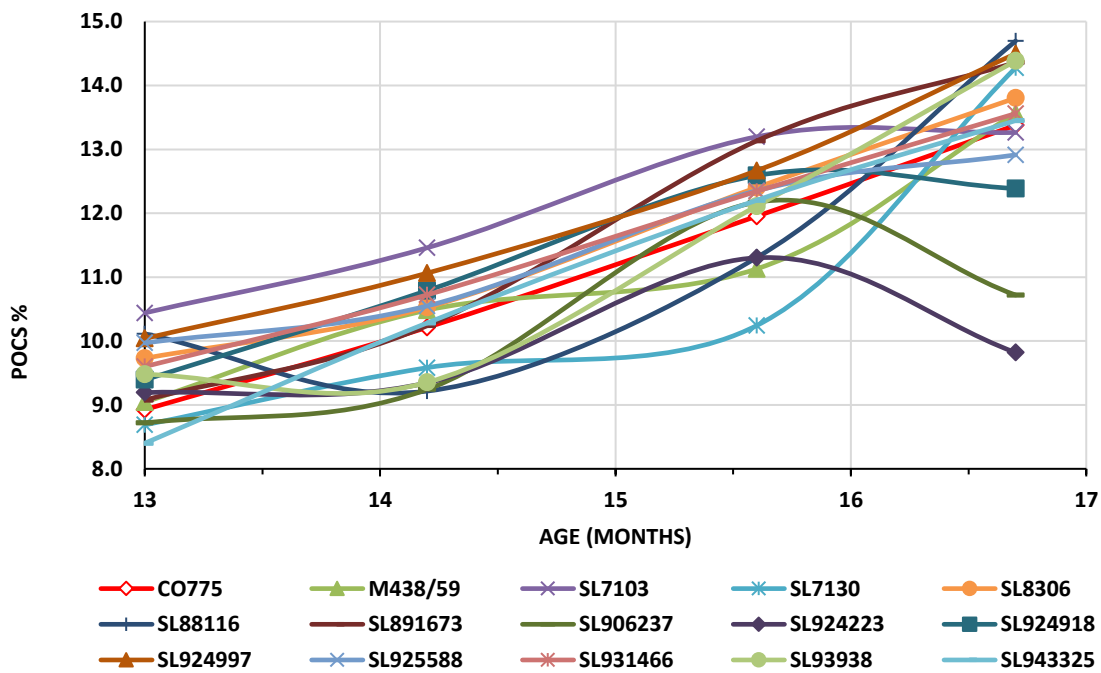


Figure 2 Variation of POCS % with the age of the varieties evaluated under rain-fed conditions in Yala season 2006

Rainfall distribution-2006

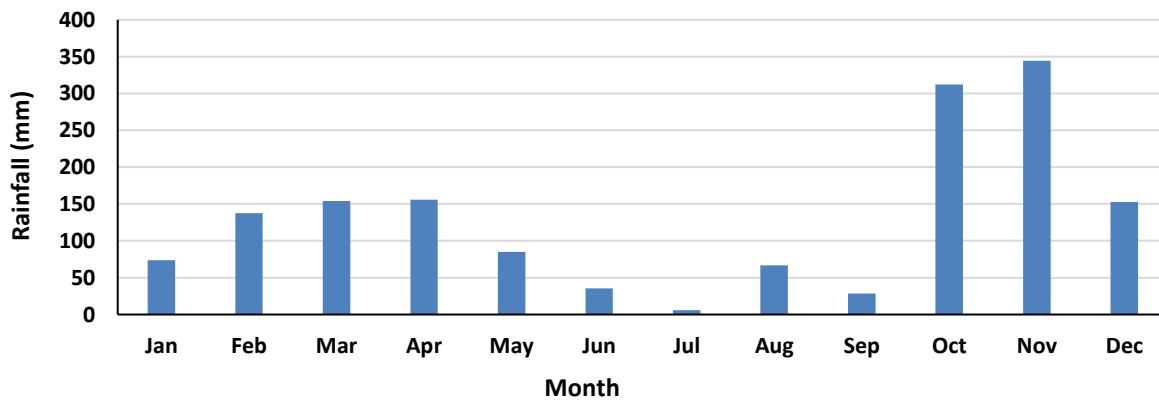


Figure 3 Monthly rainfall in 2006



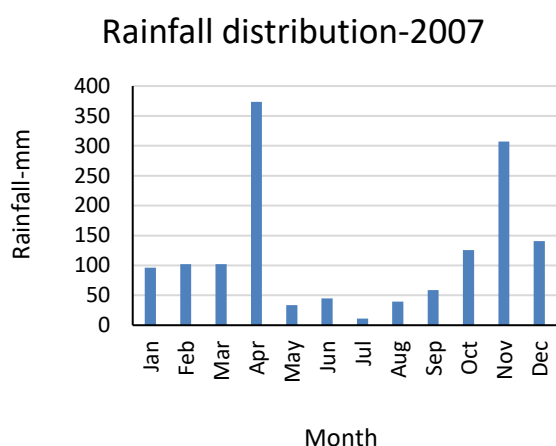


Figure 4 Monthly rainfall in 2007

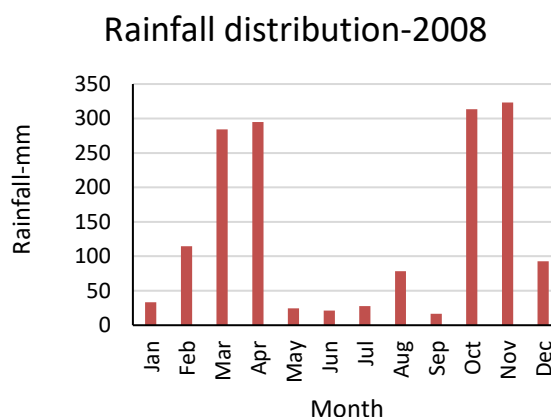


Figure 5 Monthly rainfall in 2008

Summary

Based on the results of irrigated crop higher POCS% at 11.5-13.5 months compared to standard Co 775, were observed for SL 7103, SL 88 116, SL 89 1673, SL 8306, SL121, SL 92 5588 and SL 92 4997 (Figure 1). Under rain-fed condition higher POCS% compared to standard Co 775, were observed for 13-16 months for SL 7103, SL 92 4997, SL 92 4918, SL 7130, SL 8306 and SL 92 5588.

1996 Series

SRI released the variety SL 96 128 and SL 96 328 for commercial cultivation in 2012 and there are 12,000 ha of SL 96 128 and 398 ha of SL 96 328 in commercial cultivations as of 2020.

Variation of POCS % in juice based on the maturity testing experiment conducted at SRI from 2007-2009

Location: SRI research farm

Crop status: Plant crop

Water regime: Irrigated crop

DOP: March 2007- May 2008

Juice analysis: From 08th months age onwards

Standard variety: Co 775



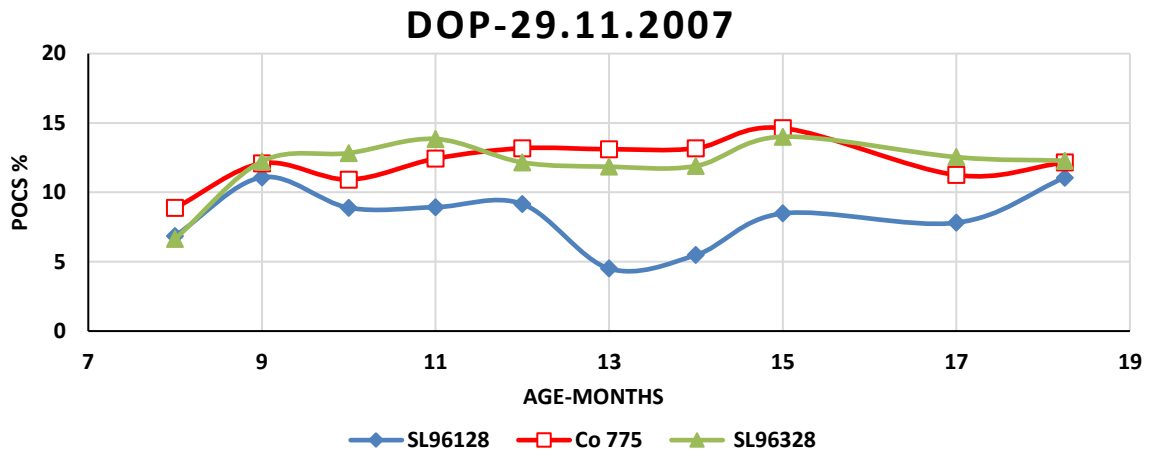


Figure 6 Comparison of variation of POCS % of 96 series varieties with Co775 under irrigated conditions in *Maha* season 2007 at SRI

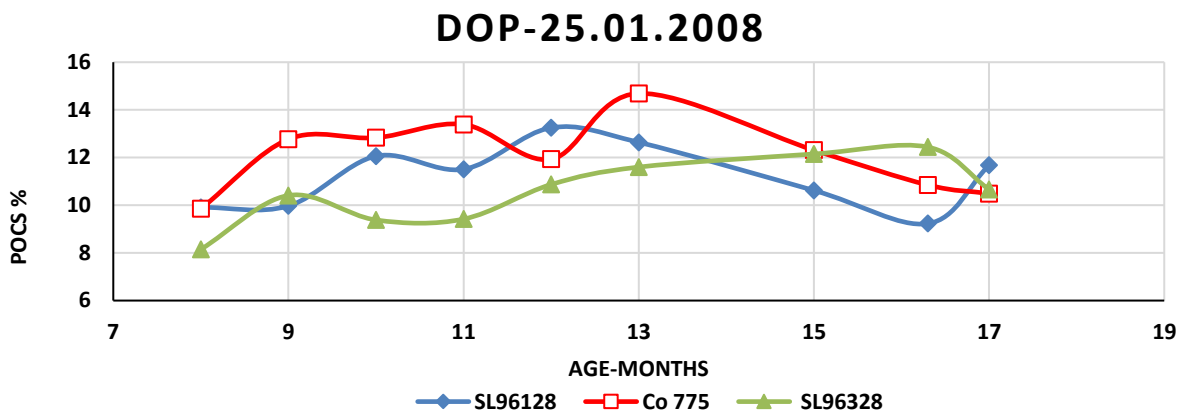


Figure 7 Comparison of variation of POCS % of 96 series varieties with Co775 under irrigated conditions in *Maha* season 2007/2008 at SRI

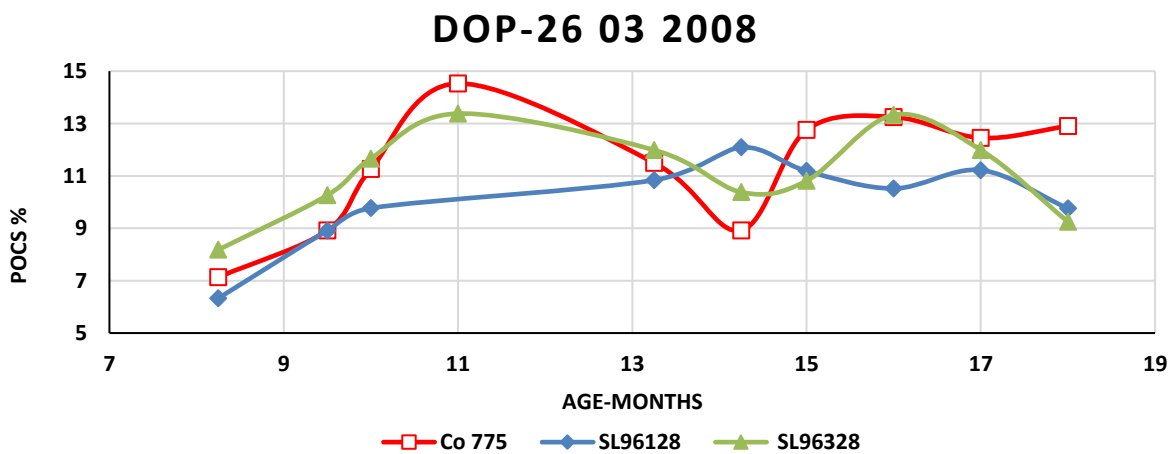


Figure 8 Comparison of variation of POCS % of 96 series varieties with Co775 under irrigated conditions in 2008 *Yala* season at SRI



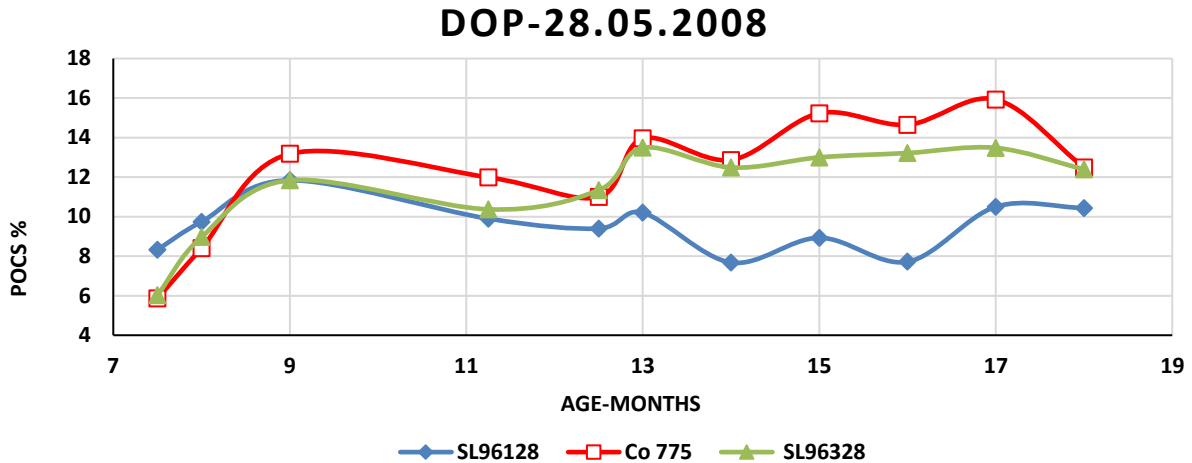


Figure 9 Comparison of variation of POCS % of 96 series varieties with Co775 under irrigated conditions in 2008 *Yala* season at SRI

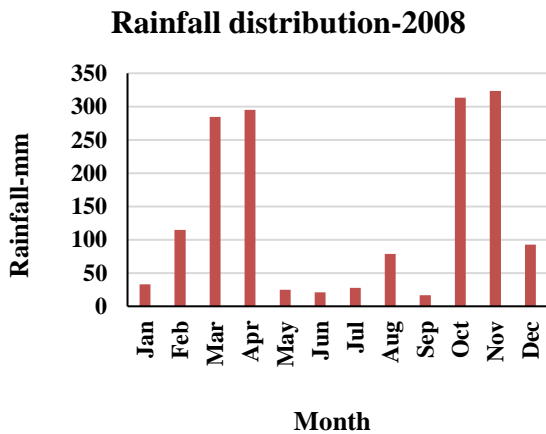


Figure 10 Monthly rainfall in 2008

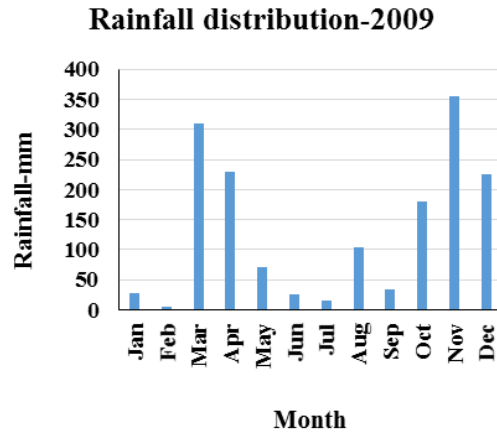


Figure 11 Monthly rainfall in 2009

Summary

According to the observations, SL 96 128 is more sensitive to planting time of the year. It was observed that the highest POCS % was recorded for SL 96 128 when the crop was established from January –March (Figure 7-8), and very low POCS % was observed when it was planted in late November (Figure 6). However, SL 96 328 showed a similar pattern to Co 775 both *Yala* and *Maha* seasons. In general, the highest POCS % was observed in the months with low rainfall and low POCS % was observed when rainfall is high during the sample harvesting time (figure 10 and 11)

1998 Series

Sugarcane research institute (SRI) released the variety SL 98 2524 for commercial cultivation in 2015 and there are 975 ha of commercial cultivations as of 2020 in Pelwatta, Sevanagala, Gal-Oya, and Ethimale plantations.



Variation of POCS % in juice based on the maturity testing experiment

Location: SRI research farm

Crop status: Plant crop

Water regime: Irrigated crop

DOP: from 23/11/2010- 05/10/2011

Juice analysis: From 08th months age onwards

Standard variety: Co 775

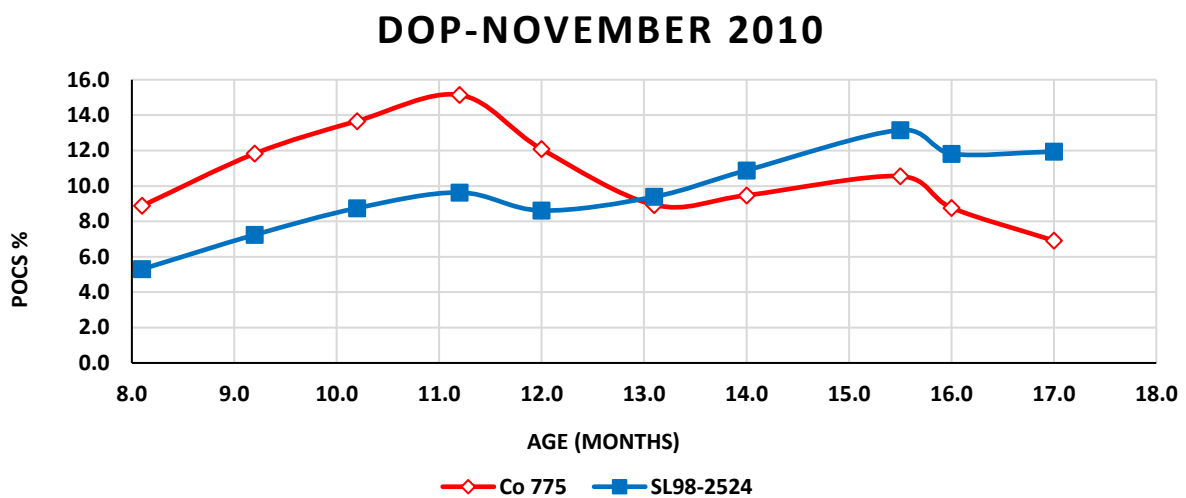


Figure 12 Comparison of variation of POCS % of SL98 2524 with Co775 under irrigated conditions in 2010 *Maha* season at SRI

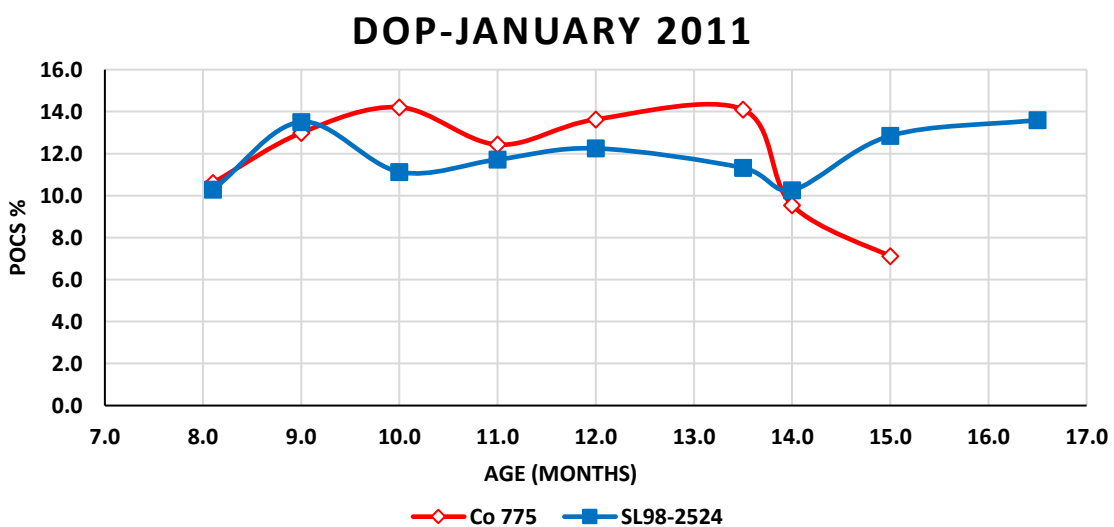


Figure 13 Comparison of seasonal variation of POCS % in SL98 2524 with Co775 under irrigated conditions in 2010 *Maha* season at SRI



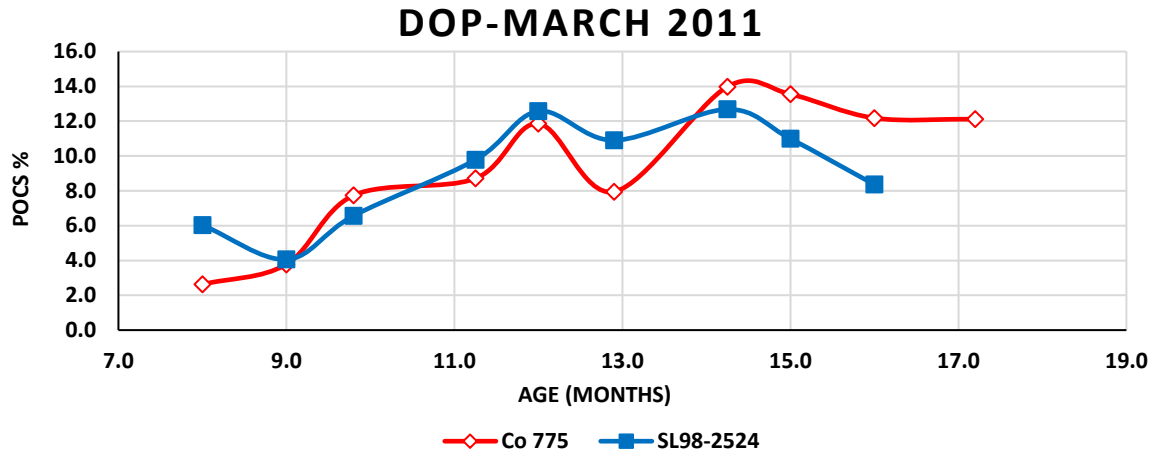


Figure 14 Comparison of variation of POCS % in SL98 2524 with Co775 under irrigated conditions in 2011 *Yala* season at SRI

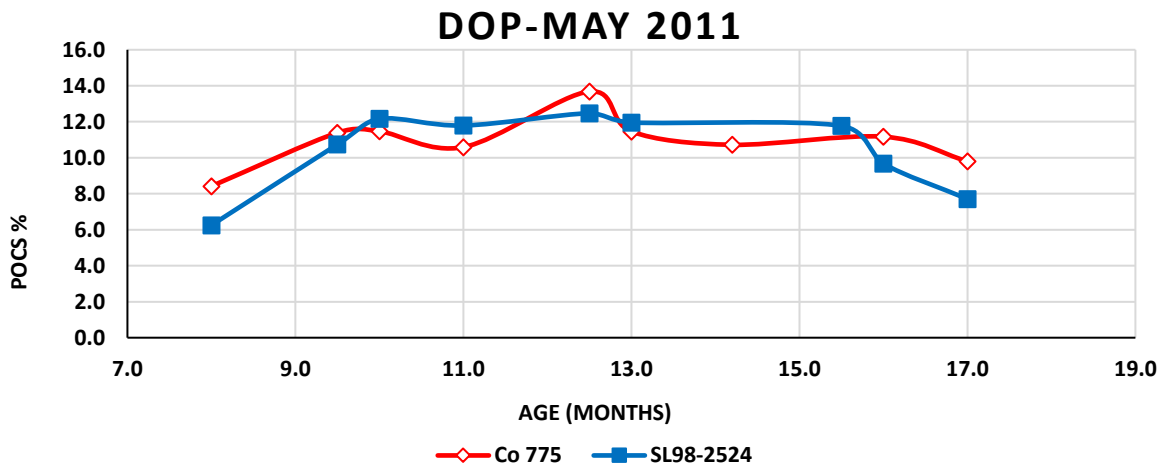


Figure 15 Comparison of variation of POCS % in SL98 2524 with Co775 under irrigated conditions in 2011 *Yala* season at SRI

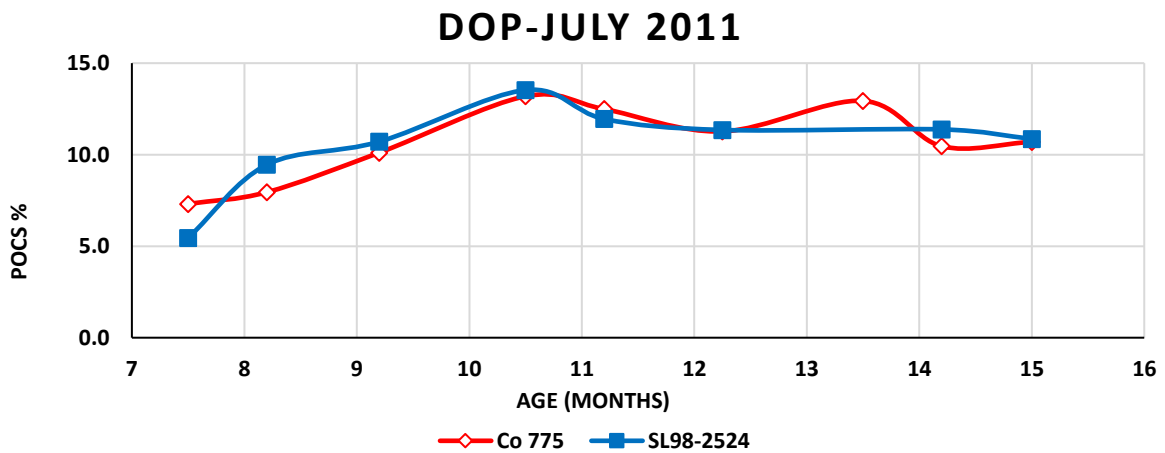


Figure 16 Comparison of variation of POCS % in SL98 2524 with Co775 under irrigated conditions in 2011 *Yala* season at SRI



DOP-OCTOBER 2011

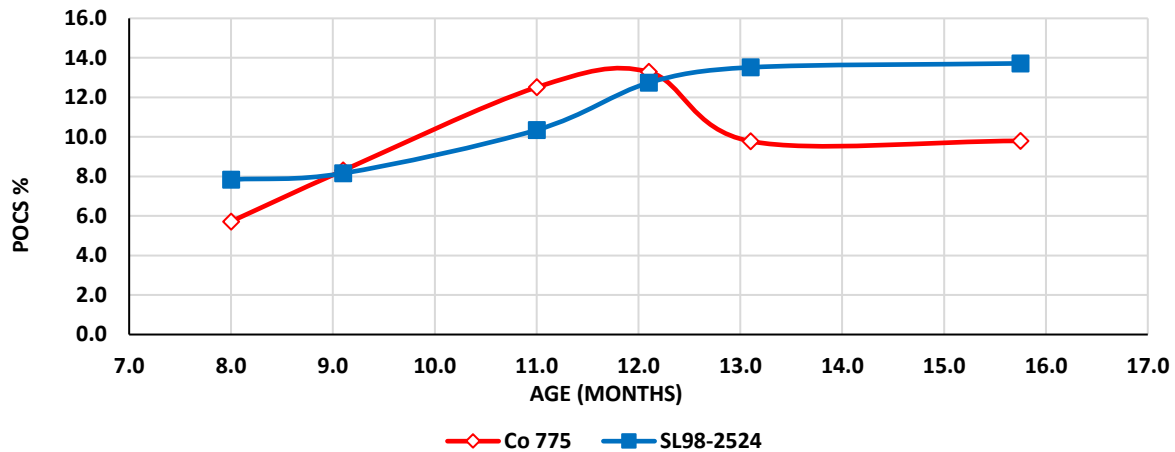


Figure 17 Comparison of variation of POCS % in SL98 2524 with Co775 under irrigated conditions in 2011 *Maha* season at SI

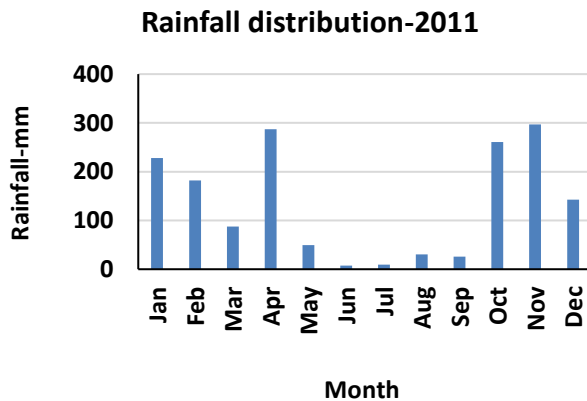


Figure 18 Monthly rainfall in 2011

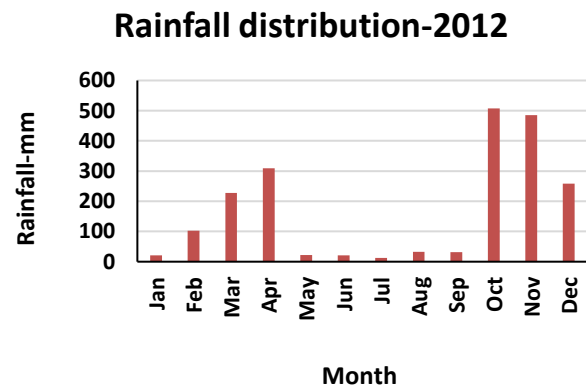


Figure 19 Monthly rainfall in 2012

Summary

SL 98 2524 showed a similar maturity pattern compared to Co 775 when the crop is planted in *Yala* season and the highest POCS% was observed from 12-15 months age (Figure 14-16). When the crop was established at *Maha* season, high POCS % was observed compared to Co 775 after 13-14 months of age (Figure 12 and 17). Generally, The highest POCS % was observed in the months with low rainfall, and POCS % reducing trend was observed when rainfall is high during the sample harvesting time (Figure 18 and 19)

2000 Series varieties

Location: SRI research farm

Crop status: Plant crop

Water regime: Irrigated crop

DOP: January 2014- November 2014

Juice analysis: From 08th months age onwards



Variation of POCS % in juice based on the maturity testing experiment

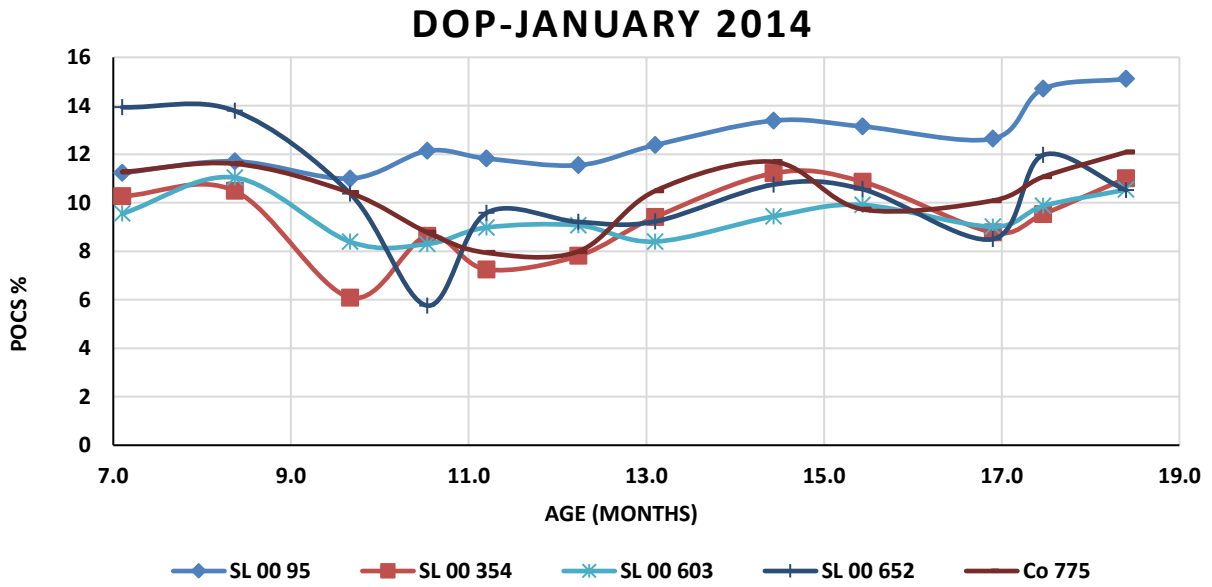


Figure 20 Variation of POCS % in 2000 series varieties with the age under irrigated conditions in *Maha* season 2013/2014

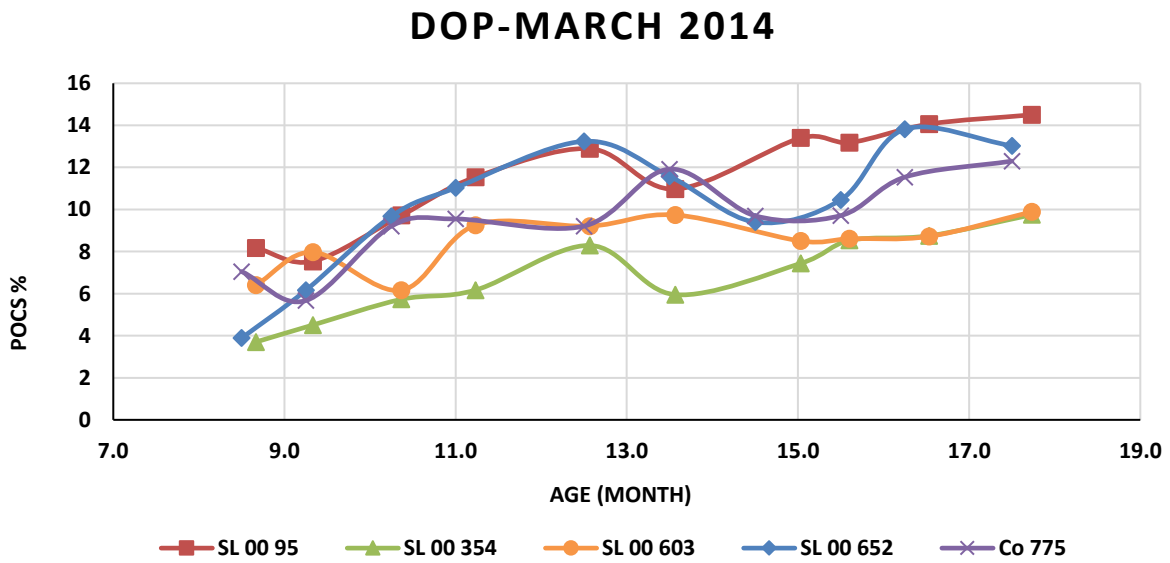


Figure 21 Variation of POCS % in 2000 series varieties with the age under irrigated conditions in *Yala* season 2014



DOP-MAY 2014

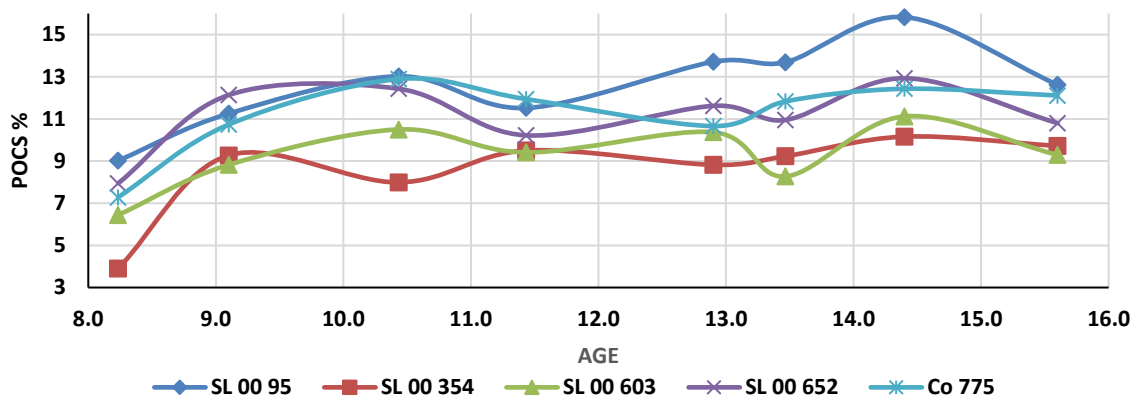


Figure 22 Variation of POCS % in 2000 series varieties with the age under irrigated conditions in *Yala* season 2014

DOP- JULY 2014

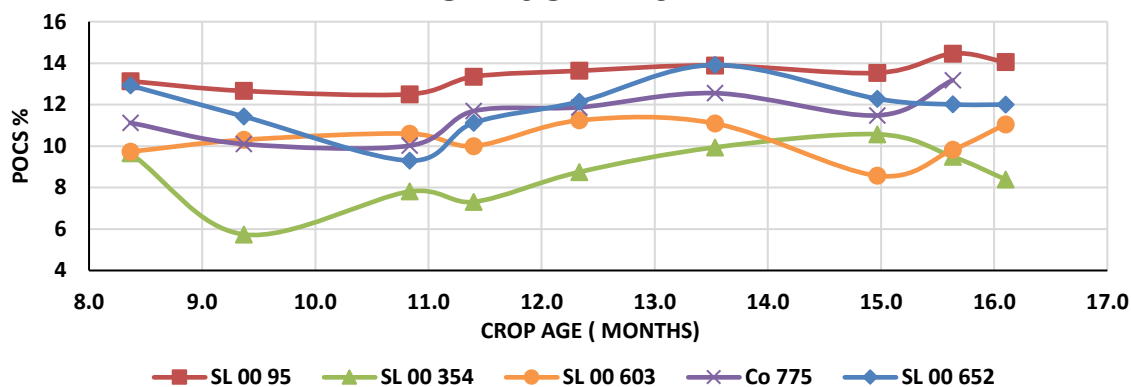


Figure 23 Variation of POCS % in 2000 series varieties with the age under irrigated conditions in *Yala* season 2014

DOP-OCTOBER 2014

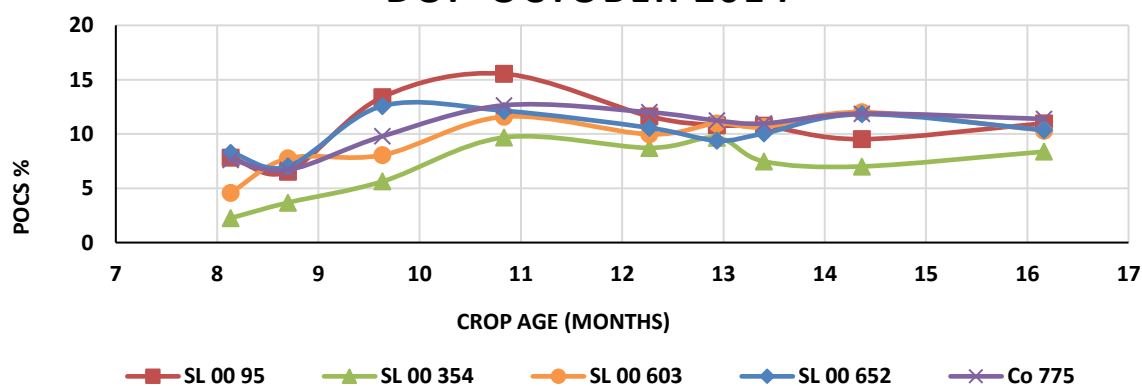


Figure 24 Variation of POCS % in 2000 series varieties with the age under irrigated conditions in *Maha* season 2014



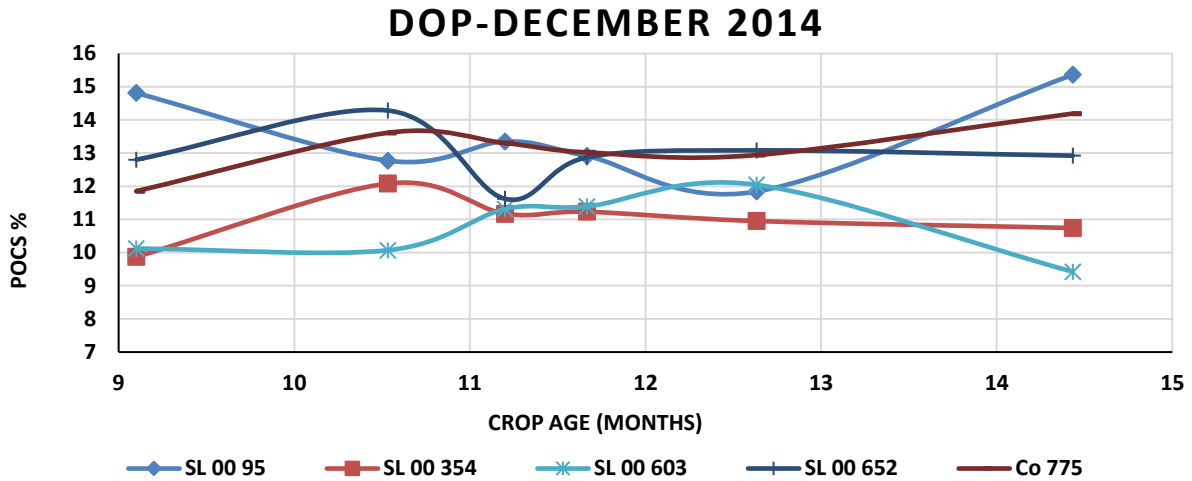


Figure 25 Variation of POCS % in 2000 series varieties with the age under irrigated conditions in *Mala* season 2014

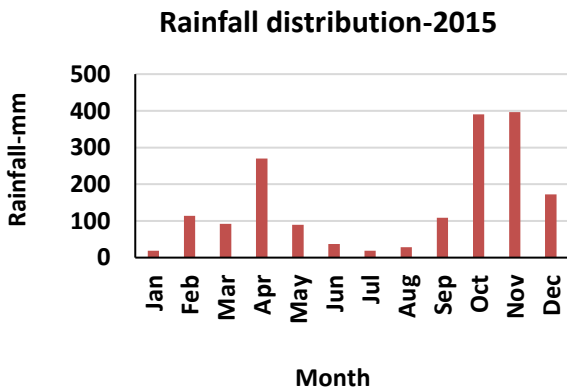


Figure 26 Monthly rainfall in 2014

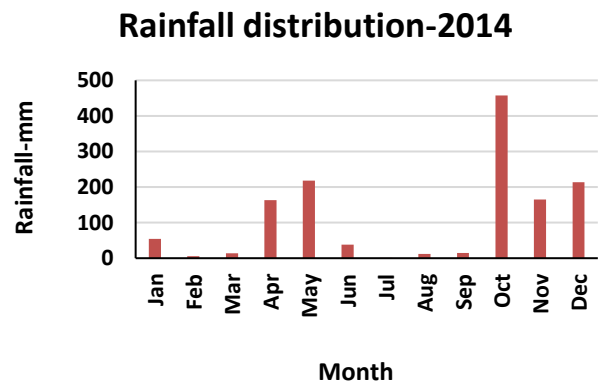


Figure 27 Monthly rainfall in 2015

Summary

SRI introduced four new sugarcane varieties (SL 00 95, SL 00 354, SL 00 603, SL 00 652) in 2000 series for commercial cultivation in 2017. The variation of the POCS % in juice are presented in the above graphs (Figures 20-25) based on different planting time. Based on the results, SL 00 95 is the best variety in terms of sugar content in the 2000 series. All other varieties are quite similar to standard CO 775. SL 00 95 variety can retain greater than 12 % POCS from 11 to 16 months age. Therefore, the SL 00 95 has a good pattern of maturity for the commercial sugar industry. The pattern of maturity of SL 00 354, SL 00 603, and SL 00 652 are quite similar to CO 775 and those varieties can be identified as mid maturing varieties. Also, all the tested varieties perform better when planted in *Yala* season in terms of sugar content (Figure 21-23). Generally, the highest POCS % was observed in the months with low rainfall, and POCS % reducing trend was observed when rainfall is high during the sample harvesting time (Figure 26 and 27).

