Report on International Pink Lady® Association (IPLA) Technical Meeting in San Francisco de Mostazal, Rancagua, Chile – Richard Hurndall and Dr Elke Crouch

The meeting was held at the Monticello Casino, owned by South African company, Sun International. There were 170 delegates, mostly from Chile, Argentina and Brazil. Presenters were from Chile, Australia, New Zealand, France, USA and South Africa (Dr Elke Crouch).

The meeting covered both pre and post-harvest aspects of Cripps' Pink and Rosy Glow. One of the stated aims of the meeting was to provide the Chilean industry with the knowledge to be able to stretch their Pink Lady® sales to September/October to reduce the peak Southern Hemisphere volumes in June. The Chilean industry Pink Lady® production is produced predominantly from Cripps' Pink trees. Their aim is to achieve a minimum of 60% red blush. It was not apparent in the presentations, but their good colour comes from harvesting late, up to starch conversion charts 9 & 10 on a 10-point scale i.e. 80% plus. In contrast to South Africa where diffuse browning is prevalent, Chile mostly has radial browning which is partly ascribed to maturity. Their levels of internal browning are much higher than in SA.

The pre-harvest topics covered nursery trees, rootstocks, new orchard establishment, nutrition and irrigation of new and mature orchards, vigour control and cropping, disease management and Cripps' Pink mutations. The symposium was a veritable Horticulture 101 for Cripps' Pink/Rosy Glow. The presentations have been uploaded to the following website: http://www.pinklady.cl/congreso/presentaciones/. They contain a wealth of information and you are encouraged to browse through them.

Stated objectives for production included:

Attain full tree height by 4th season

Achieve 65 – 70% light interception

Harvest 60% of the crop in the first two picks, with maximum 3 picks 5 – 7 days apart

Achieve 90% packout at 100 tons/ha at low starch conversion (Rosy Glow)

The last objective has been consistently achieved with one pick by a grower in Australia. Orchardists are incentivised by the amount of Pink Lady® specification fruit they pick at the optimum stage.

Labour costs are driving smaller trees, and M9, CG 202 and M26 rootstock are used in New Zealand. Take care of growth limiting factors before planting. Use high N & P in the first 2 years to force the trees. Slow extension growth is required in years 3 & 4. Extension of the terminal bud should typically be 20 cm on M9 and 30 cm on M26. This is achieved by withholding N and ensuring good K leaf levels. Leaves should be lemon-green, rather than dark green (N 1,5 – 1,9%). Strive for a calm, narrow tree. Get rid of water-shoot factories. M106 can behave like a dwarf rootstock through root pruning.

Twin-stem trees have less vigour than single-stem trees. A future orchards trial in New Zealand (Dr Stuart Tustin) involves a 10-stem tree planted at 3m apart and 1,2 – 1,5 m between rows with the objective of producing 170 t/ha. An existing Lady in Red orchard in NZ produces 140 t/ha. Focus on maximising income rather than minimising cost.

Reflective mulch is used in virtually 100% of the orchards in Australia and New Zealand. Shade cloth (white) is becoming prevalent in Australia.

The removal of leaf litter was described as a necessary step in the control of apple scab. Orchard hygiene in the orchard is important to reduce inoculum pressure for decay causing organisms. Calcium sprays help to improve resistance to disease.

There is a drive towards zero spray drift from retailers. In certain countries spray equipment needs to be tested and registered. The solution to spray coverage is not through an increase of water, but rather through air flow and settings. In Australia they aim to achieve 850 drops per square cm without runoff onto the ground. Spray volume is calculated at litres per 100 m vertical canopy rather than l/ha.

Regarding nutrition, a K deficiency will result in poor colour, small fruit, low TSS and low bloom. Good K levels counteract the effect of N on colour. The application of 100 kg/ha of K is considered a necessity. Since calcium accumulates slowly in fruit, 15 – 20 calcium sprays are recommended for good firmness and control of bitter pit. Accurate water budgets for irrigation can be calculated using crop constants, evapotranspiration factors and percentage shading in the orchard.

On the post-harvest side, Dr Elke Crouch gave an excellent presentation on harvest maturity, soil type, tree age and fruit mineral composition in browning susceptibility of Cripps' Pink apples. Under South African conditions, the more prevalent diffuse browning is a chilling injury which is affected by harvest maturity and CA storage duration in excess of 3 months. The defect is progressive in nature during shelf-life. Radial browning is less common under our conditions. It has been reported as a senescent disorder related to harvest maturity, and its risk has been linked to lower growing degree days as well as storage with CO_2 higher than 1%. Fruit that exhibit internal browning were correlated with low K and a low K/Mg ratio. Fruitlet and fruit analysis may thus provide an indication of the potential for browning.

In contrast, Chile suffers high levels of radial browning in regular atmosphere storage. Their 6-year study presented by Carolina Torres indicated that radial browning could be ascribed to growing degree hours (GDH) and harvest firmness. Diffuse browning was linked to GDH and background colour at harvest. A typical stepwise cooling is 10 days at 10 °C; 20 days at 4 °C; thereafter at 1 °C. Their best regular atmosphere (RA) storage result was achieved in combination with SmartFresh^{SM}, stepwise cooling and final storage at 1,5 °C for 120 days resulted in less than 10% browning. They have been experimenting at higher RA storage temperatures, but anything above 2 °C results in unacceptable greasiness.

French research looked at alternatives to DPA, such as Dynamic CA, respiratory quotient (RQ) and Swinglos (repeated initial low oxygen stress) technologies. Low ethylene storage under ultra-low oxygen (ULO) shows promise. Hot water dipping (2 – 3 minutes at 48 °C) in conjunction with ULO was successful and controls decay. There is however a capacity rate-

limiting issue with this treatment. It was advised not to combine wooden and plastic bins in the cold room as this compromised air flow.

Discussion with Alejandro (Alex) Fresno (Ecofresh) and Karin Sonneborn (Unifrutti)

This discussion was to establish the Forelle trends in their industry. According to Alex, their export of Forelle is approximately 900 000 cartons. Planting trends were not readily available. They achieve good production and colour, and are favouring Forelle over other bi-coloured pears. Producers are not aware of the cold storage requirement of Forelle. While there is co-ordination with respect to industry structures, they are individualistic and not as highly co-ordinated as we are in South Africa. Alex appealed for closer rapport between our two exporting countries.

Meeting with Prof Juan Pablo Zoffoli, Universidad Catolica de Chile

Prof Zoffoli does regular atmosphere storage research on Cripps' Pink. His treatments included:

Rapid cooling to 0 °C

Rapid cooling to 5 °C, followed by passive cooling to 0 °C

Passive cooling to 5 °C for 60 days followed by passive cooling to 0 °C for further 100 days

The latter treatment gave the best result. Although a treatment of 90 days at 5 °C plus 60 days at 0 °C gave good internal browning control, there was a degree of greasiness.

The use of SmartFresh^{SM} in combination with RA storage resulted in reduced decay and greasiness, but increased internal breakdown.

Their protocol for Forelle is to harvest at 14 lbs and either ship immediately or store in RA with or without SmartFresh^{SM} for up to 5 months. The fact that stem punctures is a significant problem indicates late harvest with a risk of mealiness. He is aware of the cold requirement of Forelle to prevent mealiness, as well as the use of SmartFresh^{SM} on late-harvested Forelle to prevent mealiness – Forelle Early Market Access (FEMA) programme. He was of the opinion that it would be beneficial for Forelle if someone from our industry could address their industry. A lack of funding is hampering his potential to conduct research on Forelle.

Their technology transfer to producers occurs by:

Seminars

Newsletters

Cellphone App in conjunction with advertisers

Training courses

They also provide Internet courses to students recorded in Power Point.

He noted that their government funds students to study at University of Davis, California.

Discussion with Dr Daniel Manriquez, R&D Manager, AgroFresh

He is aware of mealiness issue with Forelle and the use of SmartFresh^{SM} on late-harvested Forelle to prevent mealiness (FEMA). They use standard SmartFresh^{SM} treatment for long term storage to develop their Middle and Far Eastern markets, including China.

Their recipe to allow ripening of Packham's Triumph after SmartFresh^{SM} treatment, is to treat at a SmartFresh^{SM} concentration of 300 ppb. An intermittent warming of 5 – 10 days at 10 °C is applied, where after the fruit is recooled to -0,5 °C before shipping.

Abate Fetel is treated at a SmartFresh^{SM} concentration of 400 ppb and Bon Chretien at 500 ppb.

He kindly took us on a tour of their port city of Valparaiso.