fresh NOTES
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BROWNING ON WHITE SEEDLESS TABLE GRAPES
An update from the browning workgroup

As all involved in table grape production and exports are aware, browning on white seedless table grapes is a complicated phenomenon. Different cultivars exhibit different levels of susceptibility for browning development, and to further complicate matters there are also two categories, namely: internal and external browning. On top of this, there are multiple types of external browning (as previously shown in the browning chart circulated in 2008/09). Research over the past two years has shown that these different types of browning manifest with different development profiles over time.

This short communication attempts to summarise some of the findings of the 2009 research conducted by the Browning Workgroup comprising researchers from ARC Infruitec-Nietvoorbij, Department of Viticultural Science at the University of Stellenbosch, as well as ExperiCo (Fruit Technology Solutions). Aspects, which at this stage may be of benefit for Growers, to assist in managing the browning problem, are the following:

- External browning in the form of netlike browning may already manifest itself at high levels on bunches of grapes on the vine prior to harvest, in particular Regal Seedless. This implies that Growers should monitor the development of browning in different vineyards, starting two weeks prior to harvest, in order to be aware of the extent of the browning problem, if any, and to make management decisions as required.

Important types of external browning

Net-like
Brown necrotic streaks (dashed-like), progressing from the stylar-end towards the pedicel-end of the berry.

Mottled
Brown blotches / spots on the berry surface.

Contact
Brown marks on the berry surface, where berries touch, often associated with square-like flattened areas at the pedicel-end of the berry.

- It is reasonably clear that the longer the grape bunches remain on the vine following attainment of minimum optimum maturity, typically around 16.5°Brix, the higher the risk of certain types of external browning. Types likely to occur are mottled, contact and sunburn related browning which tend to manifest to higher levels during cold storage. Hence, it seems prudent to harvest browning sensitive cultivars within a relatively narrow harvest maturity window. Although a definitive cut-off point cannot be set at this stage, it is speculated that the minimum optimum harvest maturity standard, plus 4°Brix, may be best in order to manage risk. While quite vague at this stage, it also seems that internal browning potential may increase with advanced harvest maturity, especially on Thompson Seedless.
- It has also been shown that higher crop load in the form of number of bunches per vine, not necessarily yield in kilogram mass, does not influence browning development. Again, at this stage it is difficult to set a clear guideline in this regard because it is likely that different vineyards have different load carrying potential before browning problems arise.
- Consistently, it has surfaced that external browning development that occurs during cold storage, tends to establish within the first two weeks. While it is uncertain exactly when this development occurs during this two-week period, it is likely to be in the second week. This may preclude Growers and Exporters from being able to flag potential distress parcels prior to loading and shipping. Those who wish to have an indication of the likely quality entering the market could contemplate keeping hold-back samples for evaluation two weeks after harvest.
- Another difficult factor to manage on the farm, but which impacts on browning development, is the time and temperature in the day that the grapes are harvested. It has been shown that grapes harvested early morning have a greater propensity to develop external browning. This may be due to grape berry turgidity effects, but further research is required to confirm this. The difficulty of this finding is that we also know that if grapes are harvested later in the day when it is warmer, there is a greater chance for loose berries and SO_2 damage, and that stem condition is negatively affected. The only obvious management strategy, if at all possible, is to harvest high browning potential vineyards slightly later in the morning, but at lower temperature than those thought to give quality problems, which is based on individual grower experience.

Research will continue on browning of table grapes during the 2010 season. The research to date has shown that there is no single dominant factor which can be repeatedly linked directly to either internal or external browning development. The search will continue!