PRELIMINARY OBSERVATIONS ON THE MATURATION RATES, TASTE SCORES AS WELL AS THE SHRIVELLING AND STEM-END ROT INCIDENCES OF HASS FRUIT CULTIVATED AT LOWER AND HIGHER ALTITUDES IN THE MOOKETSI AREA

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ABSTRACT

A taste survey was performed on seven 'Hass' orchards in the Mooketsi area. Three of these were located at altitudes between 700 m and 800 m while the remaining four orchards were located between 1 300 m and 1 500 m. Dry matter (DM) content evaluations were performed between weeks 8 and 12 to serve as maturity reference points. During the last three sampling sessions, ten fruits from each orchard were ripened to the ready-to-eat stage after which the taste was scored. From the results it would appear that, during the eight week sampling period, the dry matter contents of the orchards located between 700 m and 800 m remained approximately two percent higher than those of the orchards located between 1 300 m and 1 500 m. However, the taste scores of the two groups did not show similar parallel trends. Instead, the taste scores of the higher lying orchards increased at a faster rate than those of the lower lying orchards. Upon reaching a mean dry matter content of 22%, the mean taste score of the higher lying orchards was comparable to that of the lower lying orchards when they were at a dry matter content of 24%. Although shrivelling was found to be maturity related (and thus higher in the high-altitude orchards at DM = 22% than in the lower lying orchards at DM = 24%), we are of the opinion that the intensity of the disorder was not such that it would negatively influence marketing. Stem-end rot also decreased linearly and considerable variation occurred between samples. Triangle tests will be performed during the 2021 season to confirm whether the above taste related trends hold true.

INTRODUCTION

During the last decade, the European market situation has significantly changed for South African producers. This was primarily due to the entry of South American production countries, especially Peru, to the market.

One way of mitigating the situation is to decrease the volumes of South African 'Hass' marketed during the midseason and to increase the volumes exported during the early and, to a lesser extent, the late season. During the early season, acceptable taste is an important consideration when deciding when to start harvesting. The present study was launched after certain preliminary observations indicated that the sensory characteristics of 'Hass' fruit from high altitude 'Hass' orchards were acceptable before the mandatory 23% dry matter content level was reached (Kruger *et al*., 2020). The current study concerns the maturation rates, taste scores and the incidences of shrivelling and stem-end rot in 'Hass' fruit from higher and lower lying 'Hass' orchards in the Mooketsi area.

MATERIALS AND METHODS

A survey was performed on seven 'Hass' orchards in the Mooketsi area. Three of these were located at altitudes between approximately 700 and 800 meter above sea level (m.a.s.l.). The remaining four orchards were located between approximately 1 300 m.a.s.l. and 1 500 m.a.s.l.

Dry matter content evaluations were performed between weeks 8 and 12 to serve as a maturity reference. During the last three sampling sessions, ten fruits from each orchard were ripened to the ready-to-eat stage after which the taste was scored by the second author using a three-point scale where 1 = poor and 3 = good.

In addition to taste, a full set of quality analyses were performed. This included the incidences and intensities of shrivelling and stem-end rot.

RESULTS

The maturation rates of the samples are shown in Figure 1, while the taste scores are plotted in Figure 2.

From the maturity graph it can be deduced that, over the four-week sampling period, the mean dry matter contents of the orchards located between 700 m.a.s.l. and 800 m.a.s.l. were up to two percent higher than those of the orchards located between 1 300 m.a.s.l. and 1 500 m.a.s.l. However, the taste scores of the two groups did not show similar parallel trends. Instead, the taste scores of the higher lying orchards increased at a faster rate than those of the lower lying orchards. Upon reaching a mean dry matter content of 22%, the mean taste score of the higher lying orchards was comparable to that of the lower lying orchards at a dry matter content of 24%.

It should be noted that the taste scores recorded in the present study were considerably lower than those reported on during the 2019 season (Kruger *et al*., 2020). This serves to emphasise the subjectivity of taste scoring. For this reason, we will be performing a series of triangle tests using many panellists during the 2021 season. This ought to provide a decisive result.

In contrast with taste, shrivelling displayed a linear reduction that was not related to orchard altitude (Fig. 3). About half the fruits showed signs of shrivelling at a dry matter content of 20.5%. This gradually decreased and was absent at a projected value of around DM = 25.5%. The incidence of shrivelling reduced by around 10% for each 1% increase in dry matter. At a dry matter content of 22%, the incidence of the disorder was around 30% and this reduced to 20% upon reaching 23% dry matter. As was the case with taste, the scoring criterium was stricter than last year and fruits with minimal sub-commercial shrivelling were included in the incidence calculations. It is therefore doubtful whether the 20% higher incidence of shrivelling recorded at 22% compared to 24% will be commercially important.

Although stem-end rot also decreased linearly as the fruits matured, considerable variation occurred between samples (Fig. 4).

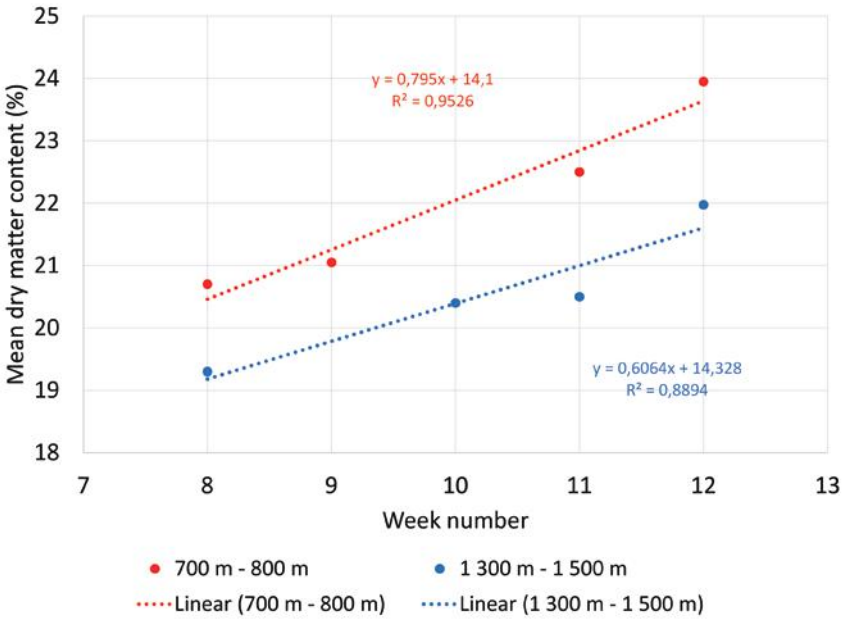

Figure 1: Mean maturation rates of three 'Hass' orchards located between 700 m.a.s.l. and 800 m.a.s.l. and four orchards located between 1 300 m.a.s.l. and 1 500 m.a.s.l. in the Mooketsi area during the 2020 season.

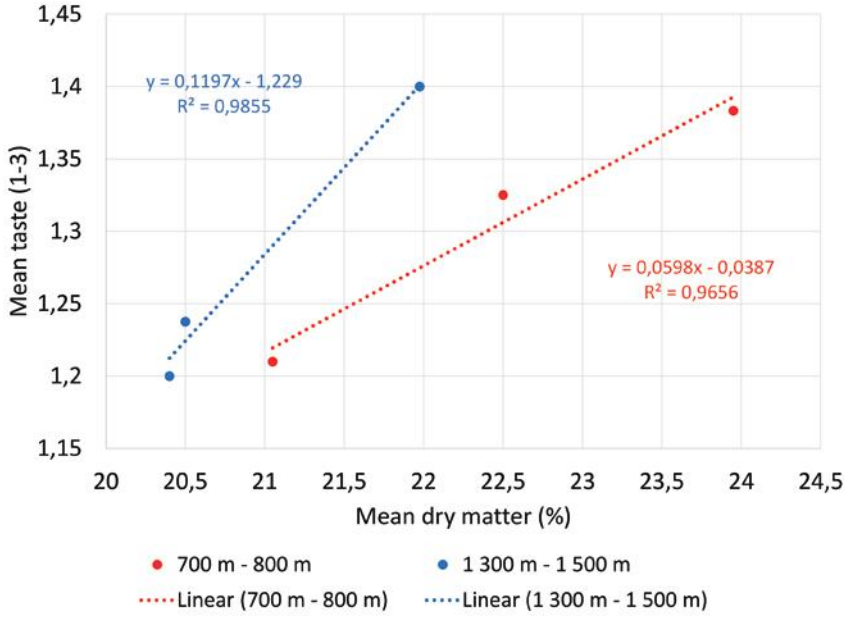

Figure 2: Mean taste scores of 'Hass' fruit from three orchards located between 700 m.a.s.l. and 800 m.a.s.l. and four orchards located between 1 300 m.a.s.l. and 1 500 m.a.s.l. in the Mooketsi area during the 2020 season.

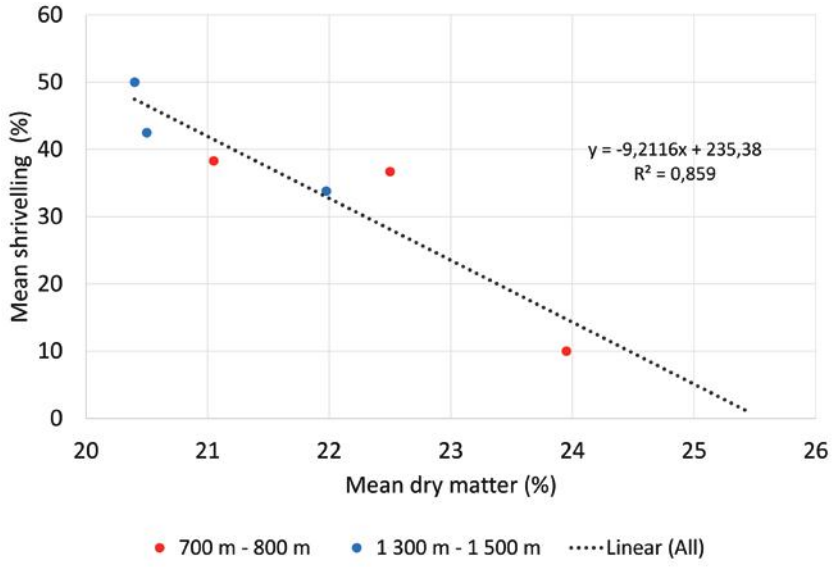

Figure 3: Mean incidences of shrivelling in 'Hass' fruit from three orchards located between 700 m.a.s.l. and 800 m.a.s.l. and four orchards located between 1 300 m.a.s.l. and 1 500 m.a.s.l. in the Mooketsi area during the 2020 season.

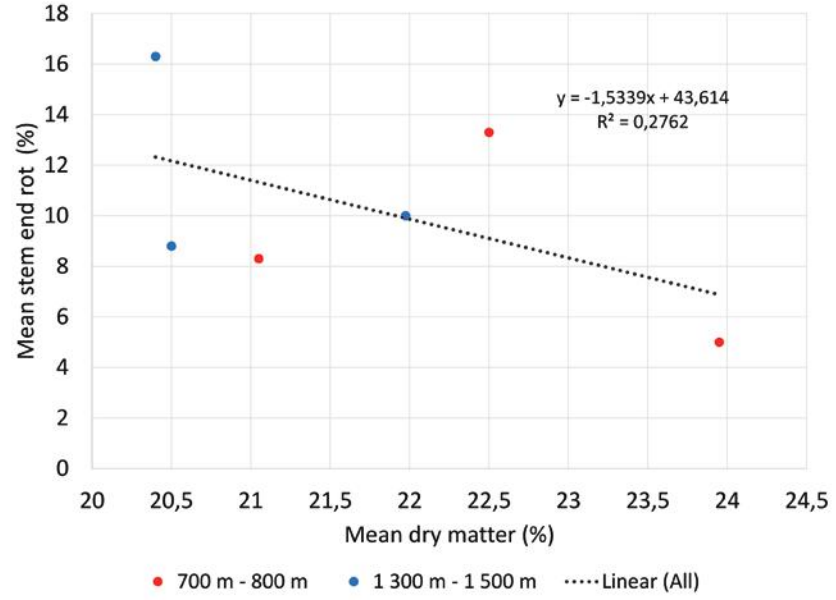

Figure 4: Mean incidences of stem-end rot infections in 'Hass' fruit from three orchards located between 700 m.a.s.l. and 800 m.a.s.l. and four orchards located between 1 300 m.a.s.l. and 1 500 m.a.s.l. in the Mooketsi area during the 2020 season.

The present results indicate that fruit from slower maturing, high lying orchards, may have acceptable taste at around 21% compared to the current 23% specified for both lower and higher lying orchards. The triangle tests that are planned for the 2021 season will confirm whether this is the case.

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