



AGRICULTURAL SERVICES: IRRIGATION

COCKTAIL PRODUCTION PRACTICES TRIALS

REPORT ON PLANTING DENSITY TRIALS

2008 SEASON

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1. Terms of Reference

During the 2008 winter season, the Agricultural Services Department in the irrigation areas, decided to investigate alternative production practices for the cultivation of the experimental malting barley variety Cocktail.

The main objective will be to evaluate and establish optimum planting density guidelines for the high yielding variety Cocktail. The trial would run over a minimum of three years per locality.

Trials were planted under overhead pivot sprinkler systems in the Douglas and Hartswater areas.

2. Procedure for Planting Density trial

- 2.1 Trials were layout using a complete randomized block design with three replications.
- 2.2 Plot sizes were 6m x 1.52m. (9.12m²)
- 2.3 Seed planting density treatments that were performed were:
 - 2.3.1 60 Kg/ha
 - 2.3.2 80 Kg/ha
 - 2.3.3 100 Kg/ha
 - 2.3.4 120 Kg/ha
 - 2.3.5 140 Kg/ha
- 2.4 Previous crop rotation during summer season was Maize at the Douglas locality and Groundnuts at the Hartswater locality.
- 2.5 Normal crop protection and irrigation practices were followed at both trial localities during the growing season.
- 2.5 Both trials were planted with a Wintersteiger plot planter and harvested with a Hege 125C plot harvester.
- 2.6 Samples were weighed and quality analysed by SABBI.
 - 2.6.1 Data were analyzed by means of Agrobase statistical software, using the Nearest Neighbours Analyses method.
- 2.9 Fertiliser treatments were as follow:
 - 2.9.1 Douglas: N=154Kg/ha, P=45Kg/ha, K=77Kg/ha

2.9.2 Hartswater: N=156Kg/ha, P=30Kg/ha, K=48Kg/ha

2.10 Analyses to be reported on include the following:

2.10.1 Yield (Kg/ha)

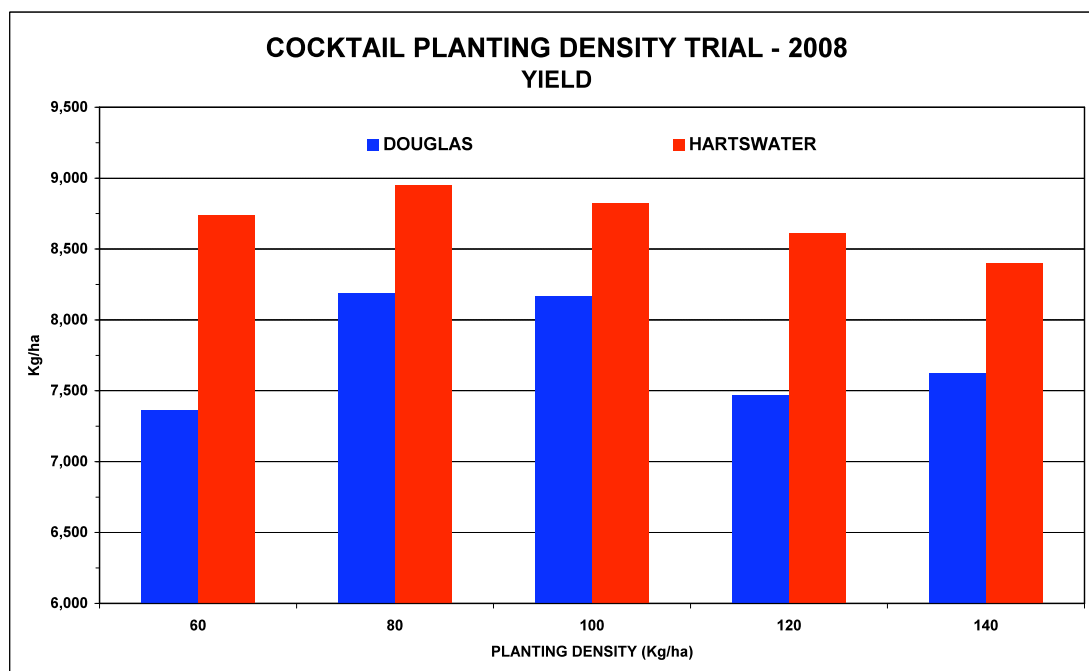
2.10.2 Kernel Nitrogen Content (TN Percentage)

2.10.3 Kernel Plumpness (Percentage)

2.10.4 Screenings (Percentage)

3. Findings

3.1 Yield: Average per treatment



3.1.1 LSD 90% level for the Douglas locality were 661Kg/ha yield with a CV of 8.3%.

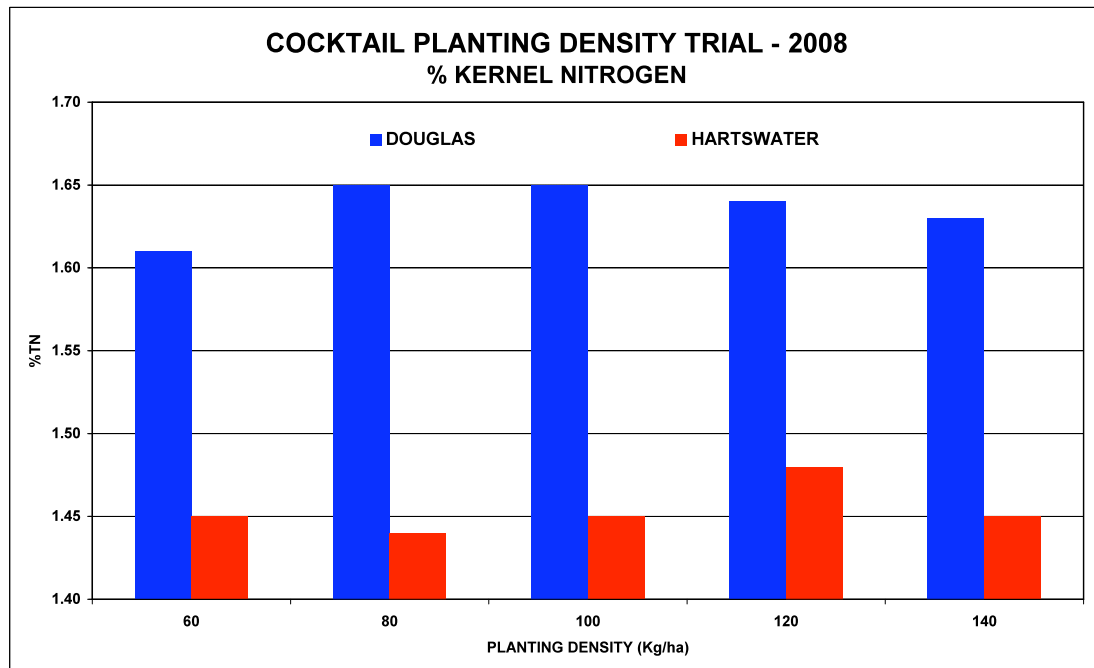
3.1.1.1 The treatment with a planting density of **80Kg/ha** yielded significantly better than both the 60Kg/ha (822Kg/ha) and the 120Kg/ha (721Kg/ha) treatments.

3.1.1.2 No significant yield increases in yield were achieved with both the **100Kg/ha and 140Kg/ha** treatments.

3.1.2 LSD 90% level for the Hartswater locality were 741Kg/ha yield with a CV of 7.4%.

3.1.2.1 The treatment with a planting density of **80Kg/ha** achieved the highest yield, but did not yield significantly lower or higher than the other four treatments.

3.2 %TN (Kernel Nitrogen)



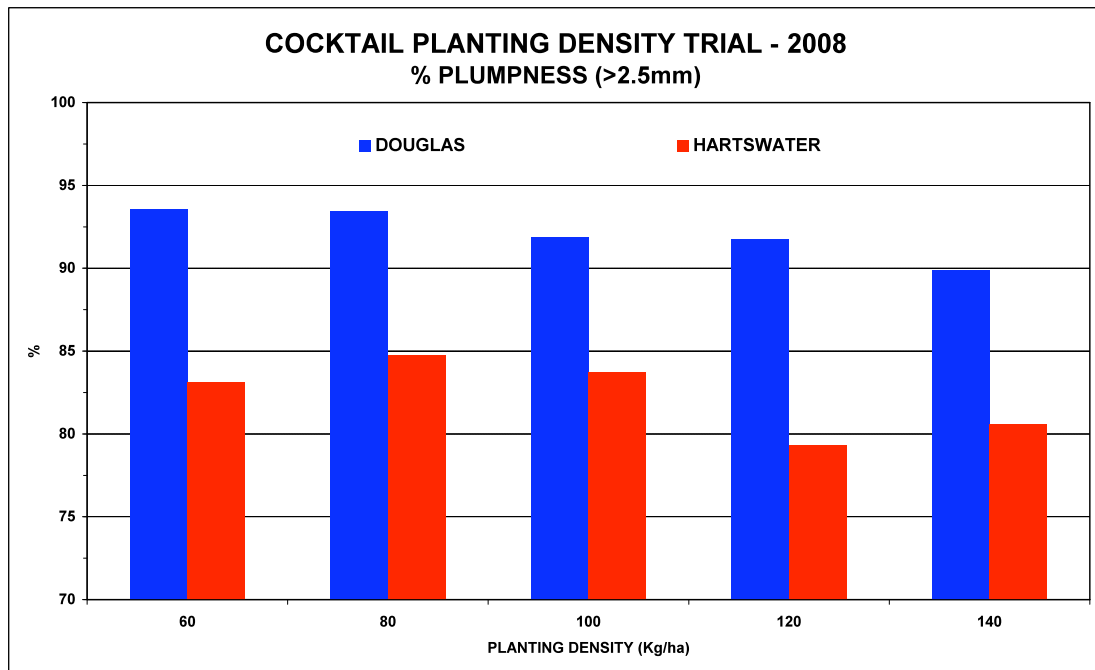
3.2.1 LSD 90% level for the Douglas locality were 0.05 %TN with a CV of 2.7%.

3.2.1.1 No significant differences were observed between all four treatments.

3.2.2 LSD 90% level for the Hartswater locality were 0.10 %TN with a CV of 5.8%.

3.2.2.1 No significant differences were observed between all four treatments.

3.3 % Plumpness (>2.5mm)



3.3.1 LSD 90% level for the Douglas locality were 2.3 % Plumpness with a CV of 2.2%.

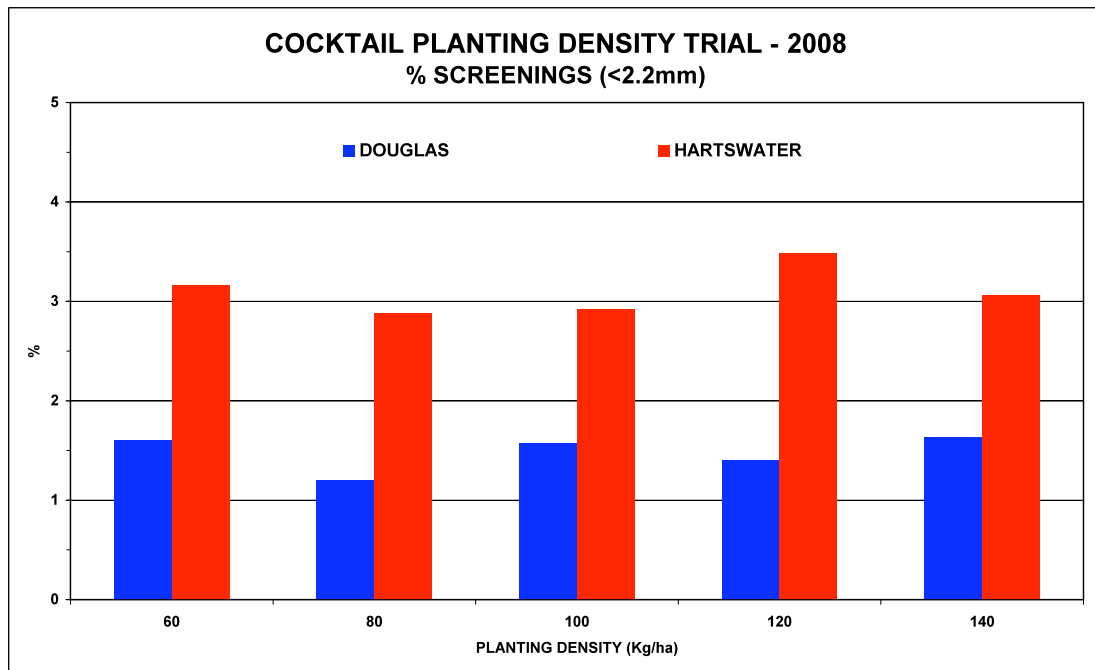
3.3.1.1 Both treatment with a planting density of **60Kg/ha and 80Kg/ha** achieved a significantly higher % plumpness than with a planting density treatment of **140Kg/ha**.

3.3.1.2 Both treatments with a planting density of **60Kg/Ha and 80Kg/ha** did not achieve a significantly higher or lower % plumpness than that of both the **100Kg/ha and 120Kg/ha** planting density treatments.

3.3.2 LSD 90% level for the Hartswater locality were 5.8 % Plumpness with a CV of 6.1%.

3.3.2.1 None of the treatments applied, resulted in a significant increase or decrease in % plumpness, with the **80Kg/ha** planting density treatment achieving the highest percentage plumpness.

3.4 % Screenings (<2.2mm)



3.4.1 LSD 90% level for the Douglas locality were 0.1% Screenings with a CV of 8.3%.

3.4.1.1 The **80Kg/ha** planting density treatment obtained a significantly lower % screenings to the **60,100,120 and 140 Kg/ha** treatments.

3.4.2 LSD 90% level for the Hartswater locality were 1.2% Screenings with a CV of 34.8%.

3.4.3 Both the **80 Kg/ha** and **100 Kg/ha** planting density treatments obtained the lowest % screenings. This was however not significantly lower than the **60,120 and 140 Kg/ha** treatments.

3.5 Conclusions

3.5.1 The different treatments showed similar results at the two localities.

3.5.2 Planting density of Cocktail has no significant influence on the kernel nitrogen content.

3.5.3 Optimum plumpness was achieved with a planting density of 80 kg/ha.

3.5.4 As is expected a planting density of 80 kg/ha also gave the optimum percentage screenings due to this treatment also giving the best percentage plumpness.

3.6 **Recommendations**

- 3.6.1 From the trial data of the first year, it can already be observed that a planting density of **80Kg/ha** will provide the highest yield and optimum quality for the variety Cocktail in both Douglas and Hartswater areas.
- 3.6.2 I recommend that both trials are to be continued for at least another two seasons.