Saltinity level is more critical to the performance of *Distichlis spicata* var. yensen-4a than light intensity

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Introduction

Distichlis spicata var. yensen-4a (NyPa Forage) is a salt-tolerant halophytic grass that is currently being commercialised within Australia for forage production on saline land. The major adaptation of this species for growth in saline conditions is its ability to excrete salt from the leaf surface, to prevent a build up of salts within the plant tissue. This experiment investigated the effect of light intensity on salt gland activity and dry matter production.

Methodology

Design: Randomized block design with 5 replicates.
Treatments: 2 Salinity (1 & 3 g NaCl/kg sand) & 2 Light levels (full light & 90% shade)
Growing conditions: Plants were established vegetatively and grown in white quartz sand with basal nutrients in a glasshouse. The plants were allowed to grow for 60 days before treatments were imposed. Leaf osmolarity was measured from excised leaves 2 days after the shading treatment was imposed, while net photosynthetic rate was measured 50 days after.

Results

•Net photosynthetic rates were decreased under shade, however total dry matter production was not affected.
• Leaf osmolarity was not affected by light intensity, but was significantly higher in the high salinity treatment.
•The highest salt excretion was from the high salinity and high light intensity treatment.
•There was a diurnal pattern in the excretion of chloride and sodium from the leaves, however this was not seen in the excretion of potassium ions.

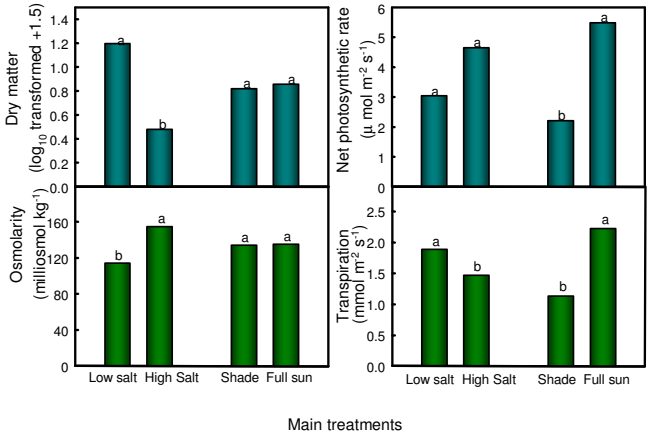

Figure 1. Dry matter accumulation, net photosynthetic rates and transpiration at the final harvest and leaf osmolarity 2 days after shading treatments imposed. Means with the same letters do not differ significantly at P=0.05.

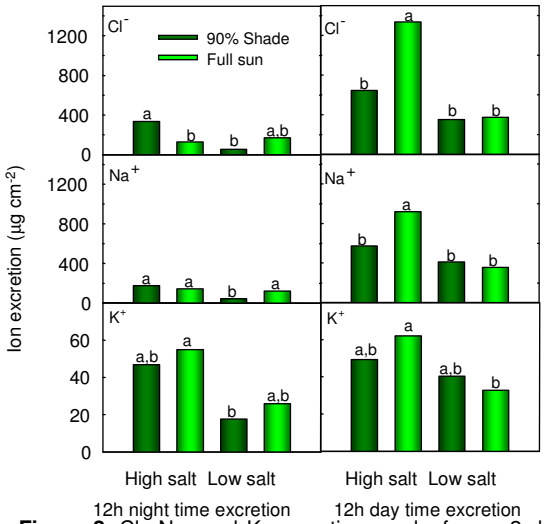

Figure 2. Cl^-, Na^+ and K^+ excretion per leaf area 2 days after shading treatments commenced over the night and day period. Means with the same letters do not differ significantly at P=0.05.

Conclusion

The results suggest that salinity has a greater influence on the short-term dry matter production than light intensity.

Acknowledgements
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