

RELATIONSHIP BETWEEN YIELD OF GRAIN SORGHUM AND SOIL SALINITY UNDER FIELD CONDITIONS

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Grain sorghum is one of the main dryland grain crops grown on the Liverpool Plains in northern NSW, an area under threat from rising water tables and associated salinity. Although data are available on the effect of soil salinity on sorghum yield, most of these relationships are derived from imposed salinities rather than naturally occurring variation.

MATERIALS AND METHODS

We assessed the relationship between soil EC_e and grain sorghum growth and yield under field conditions. A partly salinised area of about one square kilometre sown to strips of sorghum (hybrid Buster) was sampled during the 1994/95 season. We measured plant density, dry matter at flowering and maturity and grain yield from 13 locations where growth varied from good to nil. At each location and sampling time, an area of 4 m² (2 m by 2 rows) was harvested. Soil samples were taken at increments to one metre depth at flowering only and analysed for EC_e .

RESULTS AND DISCUSSION

There was a rapid decline in grain yield with increasing soil EC_e (0-10 cm), especially from 2 to 5 dS/m (Fig. 1). We also found similar responses for both dry matter and grain yield with EC_e at other depths. The decline in yield with increasing EC_e is more severe than reported elsewhere for sorghum (1, 2). Their results were obtained under artificial conditions whereby salt was added to the soil after the crop was established. This would have the effect of increasing the apparent salinity tolerance of sorghum. In our study, salinity was present throughout the growth period. This reduced plant establishment, contributing to the yield loss. Other soil factors, such as waterlogging, could have been associated with salinity to cause the yield decline we measured. However, rainfall data and observations during the growth of the crop indicated minimal problems from surface water. We acknowledge funding from GRDC, Salt Action and LWRRDC.

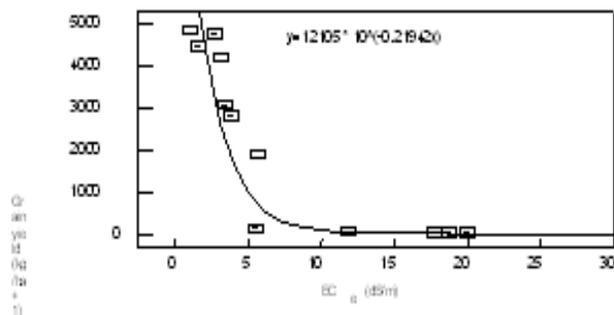


Figure 1. Relationship between EC_e (0 to 10 cm) and grain sorghum yield.

REFERENCES

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