Row spacing and plant population effects on water soluble carbohydrates yield in sweet sorghum cv. Rio

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Narrow row spacings in corn have been shown to increase the efficiency and extent of radiation utilisation (1,2). A high correlation between water soluble carbohydrate yield in sweet sorghum and solar radiation received during the fruiting stage (3) suggests that increased light utilisation through narrow row spacings may significantly increase water soluble carbohydrate yields (WSC).

Methods

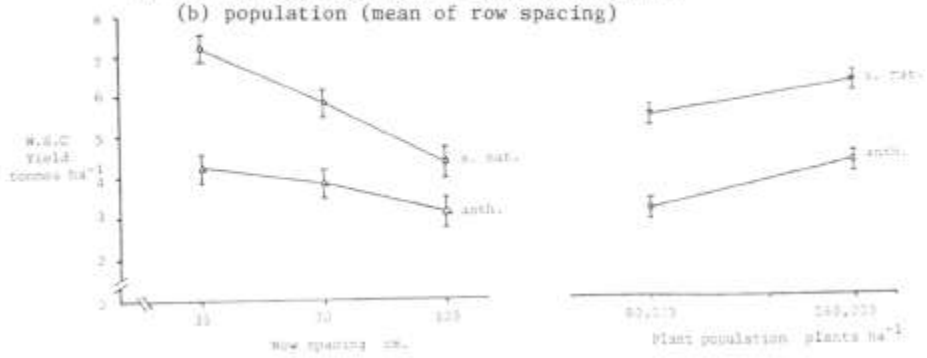
Sweet sorghum (cv. Rio) was planted on 22.12.80 at Richmond N.S.W. (latitude 33?6'S) under irrigation at three row spacings (35, 70, 105 cm) and two plant populations (80- and 160,000 plants ha^{-1}) arranged in a factorial design.

WSC yields were determined at anthesis and seed maturity. WSC concentration in stem tissue was determined by the anthrone method (4) after extraction with hot (95?C) water.

Results and Discussion

For both populations, narrow row spacing resulted in significantly greater WSC yields ($P < 0.01$),particularly at seed maturity (Figure la). WSC yields increased significantly ($P < 0.01$) at both harvests with an increase in plant population from 80- to 160,000 plants ha^{-1}. (Figure lb). No interaction between row spacing and plant population on WSC yield was recorded.

Figure 1: WSC yield (L.S.D. 5%) at anthesis and seed maturity as affected by (a) row spacing (mean of populations) and (b) population (mean of row spacing)



The experiment indicates the potential for water-soluble carbohydrate yield increases through the manipulation of row spacing and plant population. The yield advantage of narrow row spacings and high plant populations could be utilised under irrigation by the use of commercial planting machinery such as the cereal combine planter. Further investigations under dryland conditions are currently under way.

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