

The effects of seeding rate and nitrogen fertilizer on the growth and production of wheat

B. Baldwin and D. Hodgkins

Roseworthy Agricultural College, SA, 5371

Yield responses to nitrogen fertilizer are most likely to occur in wet seasons (May-October rainfall >250mm), and on soils of low nitrogen status (4). Nitrogen can stimulate tiller production and increase the number of ears per plant (1). Tiller production is also influenced by crop density. The number of tillers per plant is reduced as seed rate is increased (2) owing to inter-plant competition (3).

The aims of the field experiments described in this paper were to study the combined effects of seed rate and nitrogen fertilizer on the growth and production of wheat.

Methods

A factorial treatment design was used with 3 seed rates (30, 60 and 90 kg/ha) of wheat, cv. Condor, X 3 rates of nitrogen fertilizer (0, 20 and 40 kg/ha) applied as sulphate of ammonia at seeding. A randomised complete block design was used with 4 replications. The experiments were conducted over 3 seasons, 1977, 1978 and 1980. Crops were sown in June of each year, using a 9-row seeder, and harvested with a small plot Hege harvester. Tiller production was measured during the season and yield components obtained at maturity.

Results and Discussion

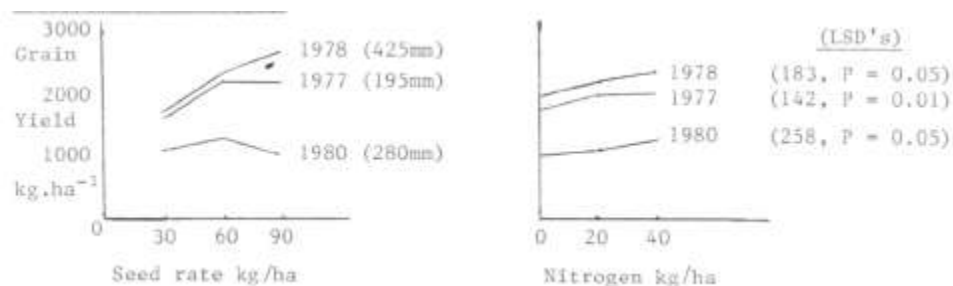


Figure 1 The influence of seed rate and nitrogen fertilizer on the grain yield (kg/ha) of Condor Wheat In parenthesis, May-October rainfall.

Significant increases in grain yield were obtained from nitrogen fertilizers up to 40 kg/ha in the wet year of 1978 and the drier year of 1980. In the very dry year of 1977, significant increases in grain yield were only obtained up to 20 kg/ha N.

Grain yields were increased by seed rate up to 60 kg/ha in the dry year of 1977 and up to 90 kg/ha in the wet year of 1978. Yield decreased in 1980 when seed rate exceeded 60 kg/ha. Although the number of ears per plant was significantly reduced by increasing seed rate in all 3 seasons, no significant increase in the number of ears per plant due to nitrogen fertilizer was obtained. There was no significant interaction between seed rate and nitrogen fertilizer in any of the 3 seasons.

These results suggest that in commercial production a fancier can decide on levels of nitrogen fertilizer application independently of seed rate.

References

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