High input wheat trials at Muresk, W.A. 1980-81

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With increasing wheat prices and a trend towards more cropping and less pastures in the cereal belt of Western Australia the optimum level of some production inputs may rise. In addition, new products coming on to the market need to be tested over a wide range of environments. The Avon Valley, which has a relatively high rainfall for the wheatbelt of Western Australia (450mm) and a scarcity of arable land, is an ideal place for high-input trials.

Methods

Treatments consisted of 'normal' and high rates of: (i) seeding - 60 and 120 $kgha^{-1}$; (ii) nitrogen fertilizer - 38 and 66 $kgNha^{-1}$; (iii) Cycocel? - nil and 1.0 lha^{-1}; (iv) the seaweed extract foliar spray, Kelpak? - nil and 2.0 lha^{-1}; (v) fungicides - nil and Bayleton? 5 lha^{-1} plus Captafol? 3 l ha^{-1}

Split plot randomised complete block designs were used with four replications and plot size 20 m x 2.5 m. The wheat (Gamenya) was planted and harvested with small plot equipment based on conventional combines and headers. Samples (3 m^2) were cut by hand before harvest to assess yield components. Nitrogen was applied as urea broadcast by hand and the other chemical treatments were applied with a boom spray. Rainfall in 1980 and 1981 totalled 333 and 426 mm respectively during the May-October growing season; evenly distri buted in 1980 but with excessive early winter rain and dry late spring conditions in 1981.

Results and Discussion

Table 1. The effect of seeding rate, nitrogen fertilizer, Cycocel? , fungicides and Kelpak? on the yield (gm^{-2}) of wheat at Muresk.

Treatment	Seeding Rate	Nitrogen		Cycocel		Fungicide	Kelpak
	1980	1980	1981	1980	1981	1981	1981
'Normal'	215	212	229	207	229	229	227
High	201	204	234	209	233	233	235

The high seeding rate in 1980 increased head density by 20% but significantly reduced grain size and grains per head by 4% and 17% respectively, resulting in an overall decrease in yield of 7% (not sig. at $p < 0.05$). This may be due to interplant competition, higher evapotranspiration in the vegetative phase and thus less available moisture at grain filling (1). None of the other treatments had any effect on yield or the components of yield, although the high N level increased grain protein from 9.5% to 9.9% in 1981 (sig. $p < 0.00$. The response to nitrogen is related to rainfall in Western Australia (2) and the dry finish may have prevented a yield response to the high N rate, especially since the 'normal' N rate used was not low. These results do not support the results reported elsewhere in Western Australia, of a 6.6% increase in yield due to Cycocel? (3). This is despite the fact that Cycocel is reported to promote root growth (4) and conditions were conducive to a response from a product which increases the plant's resistance to mild moisture stress during grain filling. The incidence of disease in the plots in 1981 was generally low so that a response to fungicides was unlikely, while the dry finish may have prevented any response to the Kelpak foliar spray.

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