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EXPERIMENTAL SUMMARY

1987

HIGH INPUT BARLEY PRODUCTION SYSTEMS
IN THE HIGH RAINFALL ZONE

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BARLEY SYSTEMS IN THE HIGH RAINFALL ZONE

EFFECT OF NITROGEN FUNGICIDES AND SEEDING RATE ON BARLEY YIELD -87BR2

OFFICERS: G.J. Parlevliet, B. Beard, R. Black.

LOCATION: Rylington Park, Mayanup

AIM: To determine the factors involved in obtaining high yield in Barley.

BACKGROUND:

Grain production system on farms are basically unsophisticated. District average yields are about 2,000 kg/ha.

Trials in the district in 1986 succeeded in achieving very high yields up to 6.4 tonne.

INTRODUCTION

This trial is the last in a series looking at high yield in Barley.

The site was at Rylington Park on a sandy gravel-gravel soil. A soil test showed low nitrogen 5.5 ppm NO₃, 5.5 ppm NH₄⁺, 34-55 ppm P, 108-167 ppm K and pH 6.2 (H₂O).

The CSBP recommendation for high yield potential suggest 80 kg N/ha and 130kg superphosphate/ha.

Super Cu Zn Mo was drilled at 250 kg/ha with the seed, a KCl application of 100 kg/ha was applied as a basal, a manganese sulphate spray of 4 kg/ha was applied at the six leaf stage. The high nitrogen treatment was in excess of the recommendation.

TREATMENT AND TRIAL DESIGN

The trial was a four component factorial -

- * Two seeding rates were compared 50 and 100 kg/ha.
- * Two Nitrogen rates were looked at 50 and 100 kg N/ha
- * Stirling and 755/339. The first is a commercial line and the second an experimental line.
- * Nil fungicide versus a Baytan seed dressing.

Superphosphate, trace elements and potassium were applied as a basal.

RESULTS

Yield kg/ha:

		Stirling		755/339		Average
		SR50	SR100	SR50	SR100	
50	Nil Fungicide	2900	3221	2336	2479	
	Fungicide	3400	3364	2471	2621	

Kg N/ha:

100	Nil Fungicide	3172	3635	2321	2614	
	Fungicide	3378	3864	2657	2450	

Variety Mean		3367		2494	
Seeding Rate Mean		2829		3031	
Nitrogen Mean		2849		3012	
Fungicide Mean		2835		3026	

Statistical analysis suggests that the varieties used are significantly different ($P < 0.005$). Similarly the seeding rates gave a significant difference ($P < 0.005$). There was a significant Nitrogen response ($P < 0.005$) and a significant fungicide effect.

Interactions occurred between V & SR, V & N, SR & Fu, S. SR. N. AND V. SR. N. Fu ($P < 0.05$).

Stirling was the higher yielding variety and responded to higher seed rate, nitrogen and the use of fungicide. The experimental line 755/339 proved to be lower yielding and less responsive to seed rate, nitrogen and fungicide. A significant block effect occurred due to soil unevenness ($P < 0.005$).

Stirling outyielded 755/339 by an average of 870 kg/ha, was an average 200 kg/ha higher at the 100 kg/ha seed rate. The Nitrogen response was 150 kg/ha and seed dressing of Baytan gave a 190 kg/ha response.

In the case of Stirling high inputs gave the highest yield 3864 versus 2900 with the low inputs. The experimental line 755/339 did not provide such response.

ECONOMICS

A yield increase of 960 kg/ha was obtained by using an additional 50kg of seed, 50 kg N and a Baytan dressing. The cost would be about \$7.50, \$30, \$5 or \$42.50 for an additional \$105 a net gain of \$63. Using only a Baytan dressing increased net gain by \$55. Using only seed net gain was \$27.50. Using only nitrogen there was no net gain.

PLANT DENSITY

The plant numbers were measured after emergence (number plants/ 5 metre) and seeding rate caused a significant plant density difference (P<0.001). There is no difference between variety but some significant difference was found with a Baytan dressing (P<0.05) probably due to disease affect on seedling vigour. There is some significant difference in plant density due to high nitrogen (P<0.10).

Stirling seedling survived at high seeding rate and nitrogen was high and the interaction significant (P<0.05).

HEADS AT ANTHESIS

When heads were counted prior to harvest, seeding rate gave a significant difference (P<0.005), nitrogen had resulted in a difference (P<0.01) and a variety x SR interaction was significant (P<0.05).

Variety	Seed Rate	Nitrogen	Fungicide	Hectolitre	200 Seed Weight	Heads	Plant
Stirling	50	50	Nil	59.7	9.55	68.5	20.6
			Baytan	59.8	9.50	70.7	23.6
		100	Nil	60.8	9.50	81.5	20.9
			Baytan	56.3	9.63	79.0	21.8
	100	50	Nil	60.0	9.45	90.7	36.6
			Baytan	60.5	9.50	88.5	36.8
		100	Nil	59.2	9.38	105.5	35.7
			Baytan	62.9	9.48	98.0	42.9
753/339	50	50	Nil	51.9	11.45	78.0	23.9
			Baytan	53.1	11.10	73.0	25.2
		100	Nil	52.2	11.53	78.2	20.7
			Baytan	53.8	11.33	93.7	27.1
	100	50	Nil	51.0	10.95	81.5	35.3
			Baytan	47.9	10.88	91.0	37.2
		100	Nil	52.4	10.98	91.5	32.1
			Baytan	52.6	10.88	81.0	30.1

DISCUSSION

Increasing seeding rates from 50 to 100 kg/ha increase yield very significantly. The use of Baytan seed dressing to counter powdery mildew, also increased grain yield. Both improved economics.

The use of nitrogen beyond 50kg N did improve yield but not economic return.

The experimental Barley 755/339 proved less responsive and lower yielding than Stirling.

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