

Wheat maximum yield experiment

Author: John Sykes

Contact No: 02 6023 1666

Organisation: John Sykes Rural Consulting

Key messages:

- Wheat responds to up to 40 kg/ha of nitrogen (N), even in dry conditions.
- In dry years, wheat has not significantly responded to fungicides.
- On average, MS susceptible varieties have responded to fungicides.

Aim:

To assess the level of input required to maximise the yields of wheat grown after wheat.

Method:

A replicated experiment was established using different levels of post emergent N and fungicide to assess yield.

Results:

Table 7: Summary of 2007 yield, protein, screenings and gross margin results and average yields (2005/07)

Treatment Description	Yield (t/ha)	Protein ³ (%)	Screenings ⁴ (%)	Gross Margin ⁵ (\$/ha)	Avg Yield (05/07) ⁶ % of 40N yield
P20, 0 N	1.0	11	2	121	69
P20, 20 N	1.6	13	2	293	83
P20, 40 N	1.7	15	3	304	100
P20, 60N	1.6	16	6	255	102
P20, 80 N	1.5	15	15	206	105
P20, 100N	1.3	17	32	126	94
P20, 120N	1.0	17	22	-9	91
P20, 0 N, Fungicide ¹	1.2	12	1	198	82
P20, 20 N, Fungicide ¹	1.9	13	4	383	109
P20, 40 N, Fungicide ¹	2.1	15	5	408	119
P20, 60N, Fungicide ¹	1.8	15	10	308	115
P20, 80 N, Fungicide ¹	1.8	15	22	265	117
P20, 100N, Fungicide ¹	1.4	16	41	138	98
P20, 120N, Fungicide ¹	1.1	17	56	34	86
P20 40N, Z25 ²	2.1	14	3	413	
P20, 40N, Z39 ²	1.8	16	3	325	
P20, 40N, Z45 ²	1.7	16	6	298	
P25, 40N, Fungicide ¹	2.2	14	5	386	
P25, 80N, Fungicide ¹	1.6	14	18	199	
P30, 40N, Fungicide ¹	2.0	14	4	331	
P40, 40N, Fungicide ¹	1.9	14	4	304	
Average	1.6				2.2
LSD	0.4				

Location: Balldale

Growing Season Rainfall:

Annual: 390 mm (avg 504 mm)

GSR: 221 mm (avg 319 mm)

Soil:

Type: Red Chromosol

pH (H₂O): 4.8

P (Colwell): 37 mg/kg

Deep Soil N: 86 kg/ha

Sowing Information:

Sowing date: 23/5/2006

Fertiliser: 90 kg/ha MAP

Row Spacing: 180 mm

Paddock History:

2007 – Wheat

2006/05 – Wheat

2004 – Canola

Plot Size: 1.5 m x 16 m

Replicates: 4

All seed treated with Jockey® seed dressing, Z – Zadok's Growth Stage, N applied @ Z25 (designed for Z31).
1 - Fungicide - Two applications of 500 ml/ha of 125 g/L Triadimefon (Bayleton®) at growth stages Z30 and Z39.
2 - Z25 or Z39 or Z45 – one application of 500 ml/ha of 125 g/L Triadimefon at that Zadock's growth stage.
3 & 4 - Protein and screenings one sample from rep 4 only.
5 - Gross Margin (whole \$/ha, excl GST) based on \$400 /t (delivered local silo) and N @ \$1.20 /kg delivered.
6 - Average 2005 to 2007 yield expressed as a % of the N40 yield for that year. Avg 2005-07 N40 yield 2.2 t/ha (not all treatments included in each year). Variety – Diamondbird.

Observations and comments:

In 2007

- Addition of 20 and 40 kg/ha of N resulted in a significant increase in yield and gross margin.
- In 2007, addition of fungicide did not significantly increase yield. This may have been due to the Jockey® treatment of seed.
- Protein and screenings were not adversely affected until more than 40 kg/ha of N was applied.

Between 2005 and 2007

- The best yield (119%) was achieved from 40 kg/ha of N and the fungicide treatment.
- N responses occurred up to 80 kg N/ha in 2005. In 2006 and 2007 N responses occurred up to 40 kg N/ha.
- Fungicide responses occurred in 2005 and 2006. In 2005 this was due to high levels of disease.

Sponsors:

The Grains Research and Development Corporation, Charles Cay and Susie Cay.