Crop comparison after wheat and canola

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Location: Balldale

Growing season rainfall:
Annual: 355mm (avg 504mm)
GSR: 135mm (avg 319mm)
Stored moisture: 72mm

Soil:
Type: Red chromosol
pH (CaCl2): 5.1
Colwell P: 82mg/kg
Deep soil N: 73kg/ha

Sowing information:
Sowing date: 23 May 2008
Sowing fertiliser: 90kg/ha MAP
Varieties: see Table 1

Row spacing: 18cm

Paddock history:
2007 — wheat
2006 — canola

Plot size: 1.5 x 16m

Replicates: 3

KEY POINTS

- **Wheat on wheat following canola is an alternative that will enable more cereal crop to be grown in a rotation.**
- **Wheat or cereal after wheat has given a better return than more canola for the trial period 2004–2008.**
- **Barley yields and returns better profits than wheat or triticale under dry conditions.**
- **There were responses to fungicide treatments and added nitrogen in barley during 2008 and in all cereals during the long term.**

Aim

To test if wheat can be successfully grown after wheat and canola, and to assess if wheat is the best crop to grow at this point in the rotation.

Method

A replicated experiment was established during 2008 mostly using the same treatments to those used between 2005 and 2007.

Results

See Table 1 and 2.

Observations and comments

During the dry year of 2008, barley had the highest yield and best gross margin (see Table 1). This was also the case during 2006 and 2007.

During the four years, triticale had the best yield and barley the highest return.

The addition of nitrogen (see Table 1) significantly increased the yield of wheat, barley and triticale during 2008, and also on average throughout the period 2004–2008 (see Table 2).

The use of fungicide (see Table 1) did not significantly increase the yield of wheat or triticale during 2008. However, the use of fungicide (see Table 1) significantly increased the yield of barley during 2008. Throughout the period 2004-2008, (see Table 2) fungicides increased the yield of wheat, barley and triticale.

During the past four years, fungicide applications produced a yield rise in all cereals with a slight increase in gross margin in triticale and barley.

Canola yielded poorly during 2008 with negative gross margins. Its gross margin became more negative as additional inputs were applied.

During the period 2005–2008, canola has responded positively to nitrogen applications but not to fungicide applications.

Sponsors

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TABLE 1 Dry matter, yield and gross margin of the 2008 crop comparison experiment

Treatment description	Dry Matter (t/ha)	Yield (t/ha)	Gross Margin ($/ha)
Wheat 20kg/ha of P, 0kg/ha of N	2.4	0.8	24
Wheat 20kg/ha of P, 40kg/ha of N	3.0	1.4	112
Wheat 20kg/ha of P, 80kg/ha of N	3.1	1.1	-43
Wheat 20kg/ha of P, 120kg/ha of N	3.1	1.1	-102
Wheat 20kg/ha of P, 0kg/ha of N and fungicide	2.4	0.9	59
Wheat 20kg/ha of P, 40kg/ha of N and fungicide	3.0	1.5	121
Wheat 20kg/ha of P, 80kg/ha of N and fungicide	3.2	1.1	-53
Wheat 20kg/ha of P, 120kg/ha of N and fungicide	3.4	0.9	-160
Triticale 20kg/ha of P, 0kg/ha of N	2.3	1.0	54
Triticale 20kg/ha of P, 40kg/ha of N	2.6	1.6	119
Triticale 20kg/ha of P, 80kg/ha of N	2.9	1.2	-50
Triticale 20kg/ha of P, 120kg/ha of N	3.1	1.0	-164
Triticale 20kg/ha of P, 0kg/ha of N and fungicide	2.4	1.0	41
Triticale 20kg/ha of P, 40kg/ha of N and fungicide	3.0	1.4	68
Triticale 20kg/ha of P, 80kg/ha of N and fungicide	3.0	1.2	-46
Triticale 20kg/ha of P, 120kg/ha of N and fungicide	3.0	1.1	-140
Barley 20kg/ha of P, 0kg/ha of N	1.7	1.0	141
Barley 20kg/ha of P, 40kg/ha of N	2.2	1.7	271
Barley 20kg/ha of P, 80kg/ha of N	2.4	1.8	223
Barley 20kg/ha of P, 120kg/ha of N	2.6	1.7	115
Barley 20kg/ha of P, 0kg/ha of N and fungicide	1.8	1.5	265
Barley 20kg/ha of P, 40kg/ha of N and fungicide	2.2	2.0	352
Barley 20kg/ha of P, 80kg/ha of N and fungicide	2.5	1.5	128
Barley 20kg/ha of P, 120kg/ha of N and fungicide	2.5	1.4	36
Canola 20kg/ha of P, 0kg/ha of N	2.1	0.2	-13
Canola 20kg/ha of P, 40kg/ha of N	1.6	0.3	-54
Canola 20kg/ha of P, 80kg/ha of N	1.6	0.1	-218
Canola 20kg/ha of P, 120kg/ha of N	1.8	0.1	-292
Canola 20kg/ha of P, 80kg/ha of N and fungicide	1.9	0.1	-228
Canola 20kg/ha of P, 120kg/ha of N and fungicide	1.8	0.1	-297
Average	2.5	1.1	
Average (cereals)	2.7	1.3	
LSD	0.4	0.4	
CV	14.2%	11.6%	

Varieties — wheat (Ventura), triticale (Kosciusko), barley (Baudin), canola (Cobbler). Phosphorus applied at 20kg/ha to all plots as MAP. This included 12kg/ha of nitrogen. Fungicide — 3x 1L/ha of 125g/L Triademefon applied at Z31,Z39 and Z45 for cereals. Canola fungicide treated with Impact and Rovral for sclerotinia control at early flowering. Gross Margin – GM in $/ha. GM based on delivered local silo price of $280/t wheat, $190/t barley, triticale $200 (GST exclusive) and $550/t canola (GST exclusive) delivered Numurkah.

TABLE 2 2004-08 average grain yield (% of farmer wheat) and return (gross margin in $/ha) of the crop comparison experiment

Crop	Farmer [2]		High nitrogen [3]		High nitrogen and fungicide [4]	
	Yield (%)	GM ($/ha)	Yield (%)	GM ($/ha)	Yield (%)	GM ($/ha)
Wheat	100	148	141	158	156	155
Triticale	119	194	159	164	174	187
Barley	106	192	145	239	159	228
Canola[1]	34	42	45	28		
Lupins[1]	30	-16				

[1] 2005 to 2008 only. [2] Farmer — normal farm management including 0 nitrogen during drought years. Phosphorus applied at 20kg/ha as 90kg/ha of MAP which included 12kg/ha of nitrogen. [3] High nitrogen — Management as for 1 but 40kg/ha extra nitrogen applied post emergent. [4] High nitrogen and fungicide — As for 3 plus 3 x 1L/ha applications of 125g/L Triademefon fungicide applied at Z32, Z39 and Z45 for disease control in cereals.