

Crop comparison after wheat and canola

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Key messages:

- Wheat on wheat following canola is an alternative that will enable more cereal crop to be grown in a rotation.
- Barley yields best under dry conditions.
- There were responses to additional nitrogen (N) or fungicide treatments in all cereal crops.
- Alternative crops such as canola and lupins yield very poorly in drought seasons.

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 in 2007 using expanded treatments to those used in 2004-2006.

Results:

Table 3: Yield and gross margin return of the 2007 crop comparison experiment

Treatment Description	Dry Matter (t/ha)	Yield (t/ha)	GM (\$/ha)
Wheat 0 kg/ha of N	2.7	1.2	258
Wheat 40 kg/ha of N	4.0	1.4	305
Wheat 80 kg/ha of N	4.1	1.6	356
Wheat 120 kg/ha of N	3.9	1.5	250
Wheat 0 kg/ha of N & Fungicide	4.4	1.5	390
Wheat 40 kg/ha of N & Fungicide	4.6	1.5	345
Wheat 80 kg/ha of N & Fungicide	4.1	1.2	185
Wheat 120 kg/ha of N & Fungicide	4.5	1.4	180
Triticale 0 kg/ha of N	3.4	1.4	335
Triticale 40 kg/ha of N	3.9	1.8	432
Triticale 80 kg/ha of N	4.1	1.7	333
Triticale 120 kg/ha of N	4.1	1.6	274
Triticale 0 kg/ha of N & Fungicide	4.2	1.6	367
Triticale 40 kg/ha of N & Fungicide	4.1	1.6	331
Triticale 80 kg/ha of N & Fungicide	4.4	1.5	251
Triticale 120 kg/ha of N & Fungicide	4.6	1.5	223
Barley 0 kg/ha of N	3.1	1.1	235
Barley 40 kg/ha of N	3.9	1.6	429
Barley 80 kg/ha of N	3.9	1.6	414
Barley 120 kg/ha of N	3.9	1.6	427
Barley 0 kg/ha of N & Fungicide	4.1	1.5	381

Location: Balldale
Growing Season Rainfall:
 Annual: 392 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: 23/5/2007
 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

Treatment Description	Dry Matter (t/ha)	Yield (t/ha)	GM (\$/ha)
Barley 40 kg/ha of N & Fungicide	4.0	1.6	411
Barley 80 kg/ha of N & Fungicide	4.1	1.4	330
Barley 120 kg/ha of N & Fungicide	4.3	1.4	332
Canola 0 kg/ha of N	1.4	0.4	27
Canola 40 kg/ha of N	1.3	0.4	72
Canola 80 kg/ha of N	1.6	0.4	32
Canola 120 kg/ha of N	1.7	0.4	29
Canola 80 kg/ha of N & Fungicide	1.6	0.3	-10
Canola 120 kg/ha of N & Fungicide	1.6	0.5	58
Lupins	1.1	0.4	-48
Average	3.4	1.2	
Average (cereals)	4.0	1.5	
LSD	0.6	0.2	
CV	0.0%	15.4%	

P applied at 20 kg/ha to all plots as MAP, this included 12 kg/ha N. Fungicide - 3 x 1L/ha of 125g/L Triadimefon (Bayleton®) applied at Z31, Z39 and Z45 for cereals. Canola treated with Rovral® for septoria control at early flowering.

Table 4: 2004/07 average grain yield (% of farmer wheat) and gross margin return of the crop comparison experiment

Crop	Farmer ¹		HiN ²		HiN+Fung ³	
	Yield (%)	GM (\$/ha)	Yield (%)	GM (\$/ha)	Yield (%)	GM (\$/ha)
Wheat	100	179	141	212	156	212
Triticale	118	229	161	229	170	253
Barley	103	158	140	205	152	228
Canola	36	61	51	57		
Lupins	37	-16				

1- Normal Farm management. P applied at 20 kg/ha, N at 12-53 kg/ha including 0-40 kg/ha post emergent.

2- HiN Management as for 1 but 40 kg/ha extra N applied post emergent. 3- HiN + Fung - As for 2 plus 2 or 3 x 1 L/ha applications of 125 g/L Triadimefon fungicide applied at Z32, Z39 and Z45 for disease control in cereals.

Observations and comments:

- Addition of N or fungicide ([Table 3Table-3](#)) significantly increased the yield of wheat, barley and triticale in 2007.
- The fungicide response is unlikely to be caused by the presence of disease but may be caused by the extra green leaf observed to be produced by plants.
- In the last 4 years, ([Table 4Table-4](#)) the application of N produces a yield rise in wheat, barley and triticale, with economic returns in wheat and barley.
- In the last 4 years, the application of fungicide produces a yield rise in all cereals with a slight increase in gross margin in triticale and barley.
- Canola and lupins yielded poorly in 2007 with low gross margins becoming more negative as inputs were applied.
- Canola has responded positively to N applications but not to fungicide, even in the wetter year of 2005.

Sponsors:

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