



Nitrogen Management in Gairdner barley

The aim of this trial was to develop nitrogen management strategies that optimise the chance of achieving malt quality in Gairdner barley.

Summary of trial

At two sites, excessive application of nitrogen caused haying off of Gairdner barley in 2002. Increasing nitrogen application had a greater effect on quality than yield. Yield was limited by moisture not nitrogen.

Why it was conducted:

In 2001, Gairdner barley produced fantastic grain yields across the Wimmera but protein was often too low for Malt grade barley. TOPCROP state focus research indicates that exceeding 100 kg/ha of soil N + fertiliser N when growing barley can reduce the chance of achieving malting grade. Can the malting barley threshold for soil N + fertiliser N be increased to 150 kg/ha for Gairdner? Due to the tendency of Gairdner to produce small grain, split applications may be required to achieve the desired protein content without pushing up the screenings.

How it was conducted:

Four on-farm demonstration trials at Rupanyup, Murtoa, Natimuk and Gymbowen were conducted using the nearest neighbour design. At each site, 2 to 3 nitrogen rates were applied. The effect of timing was also investigated with pre-drill and split applications.

Results of the trial:

The 2002 growing season was not the ideal season for conducting a nitrogen trial. All sites received well below their average growing season rainfall. The top dressing treatments were abandoned at Rupanyup and Murtoa.

Grain yield and quality

Rupanyup

This site was low in available N when sampled in March with only 16 kg/ha soil N. Early visual differences between treatments indicated a response to nitrogen. Growing season rainfall was 174 mm. The site became moisture stressed in September and treatments of 100 kg/ha Urea or more caused haying off and could not be harvested. The base rate of 50 kg/ha produced a yield of 0.25 t/ha with 99% screenings and 16% protein.

Gymbowen

This site had 44kg/ha N available N when sampled in March. The season commenced well and topdressing occurred on 13 September. Unfortunately little rain followed and the crop was not harvested. Growing season rainfall was 200 mm.

Murtoa

This site had 42kg/ha N available N when sampled in March. Growing season rainfall as 172 mm. Topdressing treatments were abandoned due to the dry conditions. Nitrogen applications did not affect grain yield but protein and screenings increased as the nitrogen rate increased (Table 1). Test weights were too low to deliver any of this grain into the ABB system.

Table 1. Effect of Nitrogen application on yield and quality of Gairdner barley at Murtoa in 2002

Urea Treatment (kg/ha)	Yield (t/ha)	Protein (%)	Screening % (<2.5mm)	Test weight (kg/hL)
0	1.1	12.3	41	58
50	1.1	13.4	51	57
100	1.2	14.0	50	58
150	1.1	15.4	61	59
200	1.1	15.4	57	57
300	1.0	16.0	71	59
LSD (5%)	NS	0.77	12	NS

Natimuk

This site had 39kg/ha N available when sampled in March. After a late break, the season commenced favourably and topdressing of some plots occurred on 13 September. This was followed by a timely 8mm rain over next 5 days. October rainfall was scarce and falling in small amounts. A total growing season rainfall of 185mm eventuated. Table 2 summarises the yield and quality data. All treatments were Feed 1 quality.

Table 2. Effect of Nitrogen application on yield and quality of Gairdner barley at Natimuk

Urea (kg/ha)	Timing	Yield (t/ha)	Protein (%)	Screenings (%) (< 2.5)	Test Weight (kg/hL)
0	-	2.3	13.6	34	68
100	PD	1.9	15.6	54	68
50 + 50	Split	2.0	15.3	51	67
200	PD	1.9	16.9	46	68
100 + 100	Split	2.0	16.1	56	67
300	PD	1.9	17.3	64	67
150 + 150	Split	2.2	17.1	61	67
LSD (5%)		NS	NS	NS	NS

PD = pre-drilled; Split = pre-drilled + top-dressed

Commercial Practice

Nitrogen application had a greater effect on quality than yield at the two harvested sites. (Rainfall was the limiting factor not N). Timing of application did not affect yield or quality at the Natimuk site. Nitrogen application decisions can be informed decisions by using tools such as pre-sowing deep N soil testing and in crop nitrogen monitoring. Gairdner's inherent capacity for high yield and low protein should be considered when making nitrogen management decisions.