

Durum management

Funded by San Remo.

Key findings

- The presence of ryegrass reduced grain yields by 25%.
- Reduced sowing rates did not affect the grain yield or quality of new or standard durum varieties.
- A split application of nitrogen at GS31 and GS37 produced a significantly higher yield, 1.3t/ha.
- Growth regulants did not improve grain yield.

Why do the trial?

To measure the effect of crop defoliation, ryegrass, sowing rate and nitrogen timing on the grain yield and quality, of new durum varieties against current industry standards.

To compare the effect of growth regulants on durum grain yield and quality.

How was it done?

Plot size	1.5m x 10m	Fertiliser	DAP @ 60kg/ha + 2% Zn Urea applied as per treatment
Seeding date	22 nd May 2008		
Available soil moisture 27th March (0-60cm)	0mm	Soil nitrogen 27th March (0-60cm)	117kg/ha

There were four trials within the experiment, all randomised complete block designs with 3 replicates.

- 1) Grazing, ryegrass, nitrogen timing and seeding rate
 - Nil ryegrass or ryegrass incorporated at 25kg/ha
 - Urea @ 100kg/ha (46kgN/ha) incorporated by sowing or broadcast post emergent
 - Plots were defoliated to simulate grazing prior to 1st node (GS31) from 33cm to 4cm high with a walk behind slasher
 - 2 sowing rates were used, 70kg/ha and 140kg/ha

2) New varieties and sowing rates

4 varieties - Jandaroi, Kalka, Hyperno (WID22209) or Sainly (WID22279)

3 sowing rates - 60kg/ha, 100kg/ha or 140kg/ha

3) Nitrogen Timing – post emergent nitrogen application at varying stages of growth.

1. Nil
2. 100% at GS31 (1st node) 30th July
3. 100% at GS37 (tip of flag leaf) 21st August
4. 50% GS31 + 50% GS37 30th July and 21st August

Sowing applications of nitrogen were broadcast prior to and incorporated by sowing. Post emergent applications were broadcast prior to rain.

Rainfall after post-emergent nitrogen application,

1st node (GS31) on 30th July - 31st July 0.4mm, 4th August 2.6mm, 5th August 15.4mm

Tip of flag leaf (GS37) on 21st August - 21st August 2.2mm, 22nd August 3.0mm, 23rd August 0.6mm

4) Application of growth regulants

Applied by hand boom at 1st node on 30th July.

All plot edge rows were removed prior to harvest.

All plots were tested for grain yield, protein, test weight and screenings with a 2.0mm screen.

The ryegrass density was 303 plants per square metre.

Results

1) Grazing, ryegrass, nitrogen and seeding rate

Grazing did not affect grain yield or quality, which matches previous experimental findings at Hart and other trials. The impact of grazing on ryegrass seed set was not measured as the ryegrass died.

The presence of ryegrass reduced grain yield across all treatments by 25%.

All treatments produced screenings greater than 15%.

Grain protein was higher when the application of nitrogen was delayed until 1st node (16.2%) compared to applying nitrogen at sowing (15.3%).

2) Varieties & sowing rates

Hyperno (WID22209) and Saintly (WID22279) were the highest yielding varieties in the durum management trial, averaging 1.28t/ha and 1.22t/ha respectively (Table 1).

Seeding rate did not affect grain yield or quality for any variety (Table 1).

Kalka (0.86t/ha) was the lowest yielding variety but had the lowest screenings at 5.7%.

There was no difference between varieties or seeding rate for grain protein.

Table 1: Plant density, grain yield, protein and screenings for durum varieties and seeding rates at Hart in 2008.

Variety	Sowing rate (kg/ha)	Plant density (plants/m ²)	Grain yield (t/ha)	Protein (%)	Screenings (%)
Hyperno (WID22209)	60	72	1.34	14.3	13
	100	108	1.25	13.6	14
	140	138	1.24	13.7	17
Saintly (WID22279)	60	53	1.25	14.1	16
	100	97	1.22	13.2	21
	140	112	1.19	13.1	22
Jandaroi	60	77	1.02	15.1	28
	100	112	1.17	14.1	22
	140	133	1.06	13.7	30
Kalka	60	72	0.85	14.5	6
	100	106	0.94	14.0	5
	140	126	0.78	13.9	6
LSD (0.05)					
Seeding rate			ns	ns	ns
Variety			0.11	ns	5
Seeding rate*variety			ns	ns	ns

3) Nitrogen timing

The highest yielding nitrogen timing treatment was clearly the split application, 50% at 1st node and 50% at tip of flag (Table 2). This treatment was 0.4t/ha above the other 3 treatments. It is not clear why this treatment produced more grain.

Screenings was not significantly affected by nitrogen timing, the average result was 4.3%.

Protein was not significantly affected nitrogen timing, the average result was 16.5%.

Table 2: Grain yield (t/ha) and nitrogen timing

Nitrogen timing	Grain Yield (t/ha)
Nil	0.90
GS31	0.63
GS37	0.69
50% GS31 + 50% GS37	1.30
LSD (0.05)	0.47

4) Growth regulants

The application of any growth regulant to durum at Hart in 2008 did not affect grain yield or quality.