

Durum Agronomy

The aim of the trial is to examine various treatments that may assist in ensuring high protein, high yielding durum wheat on irrigation.

The key to successful durum production is grain quality – greater than 13% protein and the required grain colour and vitreous kernel percentages.

This trial looked at a broad range of agronomic factors that can impact yield and grain quality.

Crown Rot - Rancona Seed Dressing

Durum wheats are particularly sensitive to crown rot, a stubble borne disease. Crown rot has occurred every so often on the Trial Block, in particular where we grew 4 years of continuous wheat as part of a crop sequencing trial. In the sequencing trial, one season of a non-cereal crop reduced the amount of crown rot significantly, unlike dryland situation where stubble residues can take two or more seasons to degrade. While rotation would be the first strategy to combat crown rot, an alternative is to use a seed dressing.

Rancona® Dimension (Arysta Lifescience) is the first and only product on the market to offer Crown Rot registration.

Rancona® Dimension contains the fungicides ipconazole and metalaxyl. This combination provides disease control including the suppression of Crown Rot and Rhizoctonia in wheat and barley. In addition, this product adds protection against Pythium in wheat and barley as well as smut and bunt control in wheat, barley and oats. (Taken from the Rancona Dimension tech leaflet with some of the hyperbole removed!)

Varieties

There are several durum varieties available. Some have proved to be high yielding (eg Arrivato), while others have had poor stem strength and lodged under irrigated conditions. DBA Aurora is a recent release and topped the 2014 Griffith NVT trial with 8.95 t/ha. Aurora (thanks to the South Australian Durum Growers Association for supplying the seed), is the predominant variety sown in this trial, along with Caparoi and Jandaroi for comparison.

Micro-nutrients

In discussion with the SADGA, and previous work by Barry Haskins at Hay, there seems to be an interaction between some of the micro-nutrients and the ability of the plant to shift the N contained in the plant to the developing seed so as to meet the 13% protein requirement. Possible micro-nutrients that may assist N transport include calcium, sulphur and zinc. In the trial, the calcium and sulphur were applied as gypsum, the sulphur as ammonium sulphate and the zinc as a foliar spray at Z33.

Nitrogen Management

Growing high yielding cereals require large amounts of nitrogen to produce high grain protein. We have tried various strategies that vary from some N upfront, large applications midseason using treated urea, 10 t/ha of cow manure to late N at booting. Another treatment that was suggested by an ICC member was rather than having a split topdress, apply a single large topdress with half the N as normal urea and half as Entec urea as a way of spreading the N supply.

Total N supplied was 320 kg N/ha to all treatments, targeting 7 t/ha of durum at 13% protein.

Plant Growth Regulator

Some durum varieties tested in the past have lodged badly. Aurora has not been grown at the Trial Block and so Aurora's resistance to lodging was unknown to us, nor was the variety's response to a PGR. The treatment was "just in case" using Marvel at 570 ml/ha at Z32.

Treatment Summary

Aurora	General N treatment. Topdressed at late tillering, 2 nd node and 4 th node
Caparoi	General N treatment used
Entec Urea	First topdress was 100 kg urea + 150 kg Entec urea
Jandaroi	General N treatment used
Multi-topdressing	Several smaller topdressings earlier in the season of 25 kg N/ha
PGR	General N treatment. Trinexapac-ethyl at Z32
Plus Gypsum	Gypsum (supplying Ca and S) applied at sowing at 3 t/ha
Plus Sulphur	Topdressed with ammonium sulphate at Z34
Plus Zinc	Foliar Zn spray at Z30
Rancona Seed Dr	Used as a seed treatment to protect against crown rot
Slow release N	Addition of 10 t/ha processed cow manure
Topdress Z39, Z65	Later topdressing hoping to influence grain protein
Upfront	100 kg urea/ha pre-drilled

Yield Results

Treatment	Yield (t/ha)	Protein (%)	Screenings (%)	Test Wt (kg/hl)	Lodging Score
PGR	9.44	11.2	1.8	85.4	0
Slow release N	8.76	11.9	1.7	84.4	4
Topdress Z39, Z65	8.74	11.8	1.9	84.5	5
Entec Urea	8.59	11.5	1.9	84.1	5
Rancona Seed Dr	8.57	11.5	1.9	84.6	4
Plus Zn	8.5	12.0	2.3	83.6	3
Plus Gypsum	8.47	10.9	1.9	84.7	4
Multi-topdressing	8.46	11.5	1.8	85.3	6
Caparoi	8.36	11.6	1.3	85.0	0
Plus S	8.34	11.7	2.2	83.9	4
Upfront	8.3	11.1	1.5	84.8	5
Aurora	8.24	11.7	1.8	84.4	4
Jandaroi	7.61	12.7	0.7	84.1	4
p	0.02	0.231	0.84	0.968	
lsd	0.62	NS	NS	NS	
cv%	6.2				

The PGR treatment was the only Aurora applied treatment to yield significantly more than the control. Conversely Jandaroi yielded significantly less than Aurora.

The PGR treated Aurora and the Caparoi were the only treatments that did not suffer from lodging (A score of 0 is vertical, 9 is flat on the ground).

No treatment had an effect on protein, screenings or test weight. The N budget will have to be reviewed following these results as all treatments failed to reach the 13% minimum standard.