



Making a 10 t crop profitable

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IN A NUTSHELL

- The previous article reports on trial work that shows the potential for irrigated winter cereals to achieve yields of 10 t/ha or higher
- This article outlines the management strategies used to grow the crops at the trial sites, and shows that the management regime was profitable

Trials of winter cereals yielding 10 t/ha or higher are exciting. But more exciting are the facts that some of the varieties that yielded close to 10 t are already commercially available, and that inputs and management for the trials were profitable.

The previous article in this edition reports on excellent yield results for 2007 in the ICF project "High yielding genotypes of winter cereals for irrigated regions of south east Australia", conducted at Yanco Agricultural Institute. Although a number of new genotypes (breeders' lines) yielded above 10 t/ha, commercially released bread varieties such as Chara and Giles still yielded 9.0 t/ha with Bellaroi durum wheat over 10 t/ha. Thus the management of the trials had a large impact in achieving the high yields.

The trial management was based on the key checks in the "Eight tonne club package" which has been compiled in the "Growing eight tonnes of irrigated wheat in southern NSW" primefact available from NSW DPI offices. For the trials, extra nitrogen and fungicides were applied for targeting 10 tonnes.

Trial management

Three trials were conducted in a border check layout following a break crop of canola with a previous history of lucerne. The red loam soil site was pre-irrigated with 1.7 ML/ha and deep soil nitrogen tested. The soil nitrogen was 70 kg N/ha and this was topped up with urea applied pre-sowing (38 kg N/ha) and the nitrogen applied in MAP at sowing (12 kg N/ha) so the total nitrogen at sowing was the recommended check of 120 kg N/ha. The nitrogen at sowing was deliberately limited to reduce the chance of excessive vegetative growth and potential for lodging. Sowing fertiliser was 120 kg MAP/ha (12 kg N/ha and 26 kg P/ha). Fallow weed control was Roundup Max® mixed with dicamba and pre-emergent weed control was with Stomp® and Avadex Xtra®.

Sowing date

The trial was sown 15 May 2007 and the 100 kg/ha sowing rate resulted in the target plant population of 160–200 plants/m². Post sowing grass control was not required but effective broadleaf weed control was undertaken.

Nitrogen application

At the first node stage the shoot populations of most varieties averaged a high 780 shoots/m² which does not normally require nitrogen topdressing for a yield of 8 t/ha. Since the target yield was 10 t/ha, 68 kg N/ha was topdressed at the end of July just ahead of 9 mm rain. A second topdressing of 110 kg N/ha just before the awns became visible was applied just ahead of the second spring irrigation on 18 September. This strategy of making the delayed second topdressing the major nitrogen topdressing stage helped reduce lodging and diseases.

Irrigation

The timeliness of irrigations was a major factor in obtaining the high yields. Soil moisture was monitored with an EnviroScan and gypsum block Hansen loggers. Five spring irrigations were applied with the first irrigation on 30 August using 0.8 ML/ha with 0.7 ML/ha for each of the other irrigations. Thus the total spring irrigation water use was 3.6 ML/ha.

Disease prevention

Since the aim of the project evaluation was to target maximum yields, three preventative stripe rust applications of propiconazole fungicide were applied on 7 September, 5 October and 9 November.

The eight tonne package aimed to reduce the risk of early lodging which has been a major factor preventing consistent eight tonne wheat yields. In two of the wheat trials lodging was post flowering and had no effect on yield. However in the main wheat trial earlier lodging after flowering resulted in reduced yields for lodging-prone genotypes.

Average temperatures in the post flowering period from second to the last week October averaged 20°C which was well above the desired 14°C considered conducive to high yields so it was surprising the yields were so high.

Profitability

Based on the average yield of wheat at the trials at the Yanco site (9.8 t/ha) and the 2008 wheat price (\$350/t) the income per hectare was \$3430. The variable cost was \$1650/ha based on current (2008) herbicide, fungicide and fertiliser prices. The




irrigation cost was \$90/ML based on the 2007–08 season irrigation allocation of 13% for Murrumbidgee Irrigation and includes farm fixed and variable water costs.

The gross margin per hectare was a profitable \$1779. For the total pre-irrigation and spring water use of 5.3 ML/ha, the gross margin per megalitre was \$336/ML.

Using the same costs the gross margin per megalitre for eight tonnes was \$255/ML. If the budgets were calculated on normal irrigation season water costs the gross margin per megalitre for 10 tonnes would rise to \$395/ML.

Profitability for farm-scale commercial crops would be even higher because these calculations have been based on trial inputs which ensured there was no limit to yield, eg the three preventative fungicide treatments.

Exciting future for irrigated cereals

If this trial result is any indication there is an exciting future for irrigated wheat. The evaluation of genotypes and identification of new higher yielding varieties arising from the project led by NSW DPI researcher Andrew Milgate, managed with the eight tonne package, should lead to new levels of profitability for irrigated wheat. 

Further information

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