

Wheat production and quality in practice: Wheat growing with irrigation

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Introduction

We farm a 340 hectare mixed cropping unit on Templeton soils near Darfield, with 200 ha cropped annually, and a fine woolled Merino sheep flock as our only livestock. The two enterprises knit in surprisingly well, with the Merinos using crop residues effectively, and producing a gross margin which has often exceeded that from crops.

Our irrigation water is from two deep wells of 120 m, pumping 45 l/sec (600 gpm) through a Briggs Rotorainer, covering up to 140 ha. In this deep well area, water is expensive - Electricorp does very well from us, so we have used the services of Tony Davoren's Irrigation Scheduling Firm since its inception.

Wheat has always been an integral part of our crop rotation, ranging from 80 ha grown in the early 80's, down to the current level of 40 ha. The prices offered in recent years have not encouraged us to expand our wheat area, neither has the buyers' practice of delaying the offering of contracts until sowing time is upon us. I look back with some nostalgia at a press clipping from the 1985 season, when the wheat price was \$274 per tonne, and the price was announced in January. This is the sort of lead time that growers need for a properly planned cropping operation.

I do not propose to cover in detail the husbandry of the wheat crop, as there are some very good management packages available. Rather I shall attempt to cover some of the key elements of husbandry, within the context of three over-riding main objectives:

1. *Emphasise yield and quality:* for this is the key to obtaining profitable results.
2. *Minimise risks:* for we cannot afford crop failures, or undergrade product, given the investment made in an irrigated crop.
3. *Hold costs:* this needs to be qualified by "where appropriate", and requires experience and judgement.

Bearing in mind these three themes, let me now mention some specifics.

Planning

Select a cultivar to suit the fertility level of the paddock, e.g., premium bread wheat grown after clover and biscuit wheat on more medium fertility land. Where possible I would use a high yield potential cultivar to gain the most benefit from irrigation. Batten has consistently exceeded 7 tonnes for us, and some of the biscuit cultivars are very good, but have a limited market. I like to have soil test information no more than two or three years old, and in particular, check sulphur levels - an important component of protein.

Most cultivars have a management package available, it is important to have this information and to be aware of the subtle differences in management required. For example, Otane requires a finer seedbed, higher sowing rate (around 180 kg/ha) and does not respond to early nitrogen to promote tillering. A good agent will make it his business to provide all the required information for your particular cultivar.

Establishment

We make an effort to ensure paddocks are clean to start with, because disease problems tend to be worse under irrigation. This includes burning off previous crop residues and using the stock plus cultivation in a thorough top working of the ground to clean out any remnants of twitch which could harbour take-all.

The availability of irrigation should not be used as an excuse for late sowing, and we have found that Otane responds best when sown in late July-early August. We generally sow at slightly heavier rates than for a dryland crop to ensure a good plant population. We use a standard drill to which we have fitted wheel-mark eradicators and double springs to reduce coulter bounce.

On the cost saving objective I mentioned, we screen and treat our own seed on farm, using Australian machinery. However, it is important to renew the seed line every two or three years.

Crop Monitoring and Protection

Regular monitoring is especially critical under irrigation, where small problems can become big very quickly. The "tools of the trade" which, in the spring live in the ute, include; Nitrogen Test Strip and the Weed and Disease Identification Handbook. I have found the Nitrate Sap Test a very quick and useful check on our nitrogen policy.

I like to get weed spraying done early, (GS2-3) when weeds are small and low rates of chemical are effective. Again, this is a cost saving.

For disease control I take a preventative approach at reduced rates. Timing is the key here. In Canterbury's windy spring weather, good spray timing can be a problem and I have found the "Low-Drift" spray nozzles are very useful in extending the conditions under which we can spray.

I am a great believer in the growth regulator Chloromequat (Cycocel). Even supposedly strong-strawed wheats like Batten or Otane respond very well to Cycocel under irrigation. It is good insurance to guard against lodging and the havoc wrought by the Nor'wester by having a stronger strawed crop.

This leads into the subject of nitrogen use. To me, heavy use of nitrogen and Cycocel must go hand in hand. In general, I believe we do not use high enough nitrogen rates in New Zealand. I recall the comments made to me by a visiting English farmer who said to me "don't be afraid of a bit of lodging. Unless there are a few patches gone down then you've not put on enough nitrogen". We generally now use around 150 kg N/ha on our irrigated crops, unless after white clover when 100 kg is nearer the mark. I favour split application at these higher rates. A typical split of nitrogen for Otane would be 25% at drilling, 50% at mid-tillering and 25% applied late at ear emergence. Biscuit wheats of course, require all the nitrogen much earlier.

While the late application of nitrogen is generally regarded as only a grain quality measure, I was interested to see that Drewitt at Winchmore also recorded improved grain weight from late nitrogen (at ear emergence) in irrigated trials with Otane. At these higher rates of nitrogen the final water for grain fill is a vital one. Correct watering at this stage is necessary to avoid the problems of screenings or low kernel weight, and to maximise the yield potential which you have set up.

Irrigation Management

Tony Davoren has already covered the complexities of this subject. I can only say that having used irrigation

scheduling for several years, it takes a lot of uncertainty and worry out of the decisions on timing, quantities and priorities for water application. It is not necessary to schedule every paddock, just a representative sample of the various crops, which gives a good "feel" for the moisture status across the farm.

Apart from scheduling, a couple of points on irrigation bear mentioning. A spread of sowing dates and crop types to give a spread period of maximum water demand is a big help if your system is stretched. Also it pays to check the actual amount of water being applied with a rain gauge. It can vary significantly as well levels change and pumps wear out.

Harvest

As I mentioned earlier, risk management is all important in cropping. I hate to see a crop sit for weeks in the field for the want of a few percent moisture reduction. We have enough drying space for around half our crops, and time and again it has proved its worth in Canterbury's unreliable climate. I am always happy to spend a few dollars per tonne in order to make sure the large investment we have put into a crop is safeguarded by harvesting on time. At delivery time, we often use the grain screen to tidy up a line for screening and kernel weight and maximise the quality index points. Scottish by nature, I have always objected to giving away grain by way of dockage at the mill. These screenings are a saleable feed wheat product if removed on the farm.

Conclusions

If one is serious about minimising risk, the investments required on a cropping farm are considerable. For example, in our case, irrigation, drying plant, grain screening. It is important to have these assets earning their keep, so we do a useful amount of outside work in contract drying and grain screening. The other important consideration is that having these facilities gives a lot of scope for alternative specialist crops, where drying is often essential.

Finally, to put together all the elements of a profitable crop will take all the skills of a farmer and his staff, preferably with a consultant assisting, and by necessity with a supportive banker.