HIGH INPUT CROPPING TRIAL

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Site: Gnarwarre

These results relate to the trial printed on page 39 of the *1998 Field Day Book.*

BACKGROUND

With the relatively high rainfall of the district, there is some belief that nutrition and other agronomic inputs may be too low, thereby limiting the potential yield of crop. This is a long term rotation trial, undertaking an economic and agronomic evaluation of a high input treatment versus a district practice treatment.

In 1998 the site has been subdivided into a raised bed and non raised bed treatment for each of the District Practice and High Input areas. The reason for this, is to determine whether on a relatively well drained site, waterlogging is still having a negative impact on yield. Perhaps due to waterlogging, the plant use of the extra inputs, particularly nutrients, is being restricted.

RESULTS AND DISCUSSION

Table 1 indicates the gross margin for the Barley crop grown in 1998. As can be seen, yields have been quite disappointing particularly for the high input treatment

The crop gave the highest gross margin returns for the district practice flat treatment and the worst gross margin for the high input bed treatment.

The bed treatments performed worse than the flat treatments, again reflecting the very dry year. Right up until grain fill, the crop growing on the beds was superior to that growing on the flat. The beds however dried out more than the flat and there was also no waterlogging in the crop throughout the year, hence there was no opportunity for the beds to outperform the flat. Many of the tillers in the high input and bed treatments did not fill.

The conclusion from the 1998 Barley trial, is that in well drained soils and in a drier than average year, the crop grown on the flat and under a district practice input regime, gave the highest gross margin return.

Table 1

1998 Barley Crop Results

	HIB	HIF	DPB	DPF
YIELD	5.00	5.70	5.30	6.50
PRICE PER TONNE	90.00	90.00	90.00	90.00
TOTAL RETURNS	450.00	513.00	477.00	585.00
VARIABLE COSTS				
Seed				
100kg/ha Franklin	57.00	57.00	57.00	57.00
Herbicides				
2.0 l/ha Roundup CT	24.50	24.50	24.50	24.50
1.7 l/ha MCPA	11.50	11.50	11.50	11.50
Fertiliser				
100 kg/ha Urea pre drilled	38.50	38.50	38.50	38.50
100 kg/ha DAP at sowing54.00	54.00	54.00	54.00	
100 kg/ha Urea top dressed	38.50	38.50		
Insecticide				
100 mls/ha Lemat	3.30	3.30	3.30	3.30
Machinery				
Bed Forming	25.00		25.00	
Sowing	18.00	18.00	18.00	18.00
Fertiliser application	30.00	30.00	15.00	15.00
Spray insecticide	5.50	5.50	5.50	5.50
Spray herbicide	11.00	11.00	11.00	11.00
Contract Work				
Contract Windrowing	15.00	15.00	15.00	15.00
Contract Harvesting	55.00	55.00	55.00	55.00
Contract Cartage	50.00	57.00	53.00	65.00
COSTS	436.80	418.80	386.30	373.30
GROSS MARGIN	13.20	94.20	90.70	211.70

HIB (High Input 1.7 Beds)
HIF (High Input Flats)
DPB (District Practice 1.7m Beds)
DPF (District Practice Flats)

Table 2

High Input Trial Summary Results 1999

	Yield T/Ha	Returns/Ha	Costs/Ha	Gross Margin/Ha
High Input Canola 1996	3.2	$1,237	$721	$516
High Input Wheat 1997	6.0	$967	$432	$535
High Input Barley 1998	5.7	$513	$419	$94
Total GM/ha	**14.9**	**$2,717**	**$1,572**	**$1,145**
Average GM/ha				**$382**
District Practice Canola 1996	3.2	$1,414	$342	$1,072
District Practice Wheat 1997	6.3	$1,002	$285	$717
District Practice Barley 1998	6.5	$585	$373	$212
Total GM/ha	**16.0**	**$3,001**	**$1,000**	**$2,001**
Average GM/ha				**$667**

Table 2 gives the summary of performance over the last three years.

The average gross margin for the high input treatment was significantly lower than for the district practice treatment over the last 3 years. The major reason I suggest for this, is that we have experienced significantly lower rainfall than the long term average over this period, with the result that the crops have not been able to reach their full yield potential.

What the results highlight, is that we need to be aware of our cost of production. The following Table shows the comparison

Treatment	Average Returns/ha	Average Variable Costs/ha	%costs vs returns
High Input	$906	$524	57.8%
District Practice	$1,000	$333	33.3%

As can be seen, the district practice treatment is much more efficient than the high input treatment in being able to convert input dollars to output dollars.

My recommendation at this stage is that for consistently good returns and taking into account the variability of seasonal conditions, the crop inputs need to be kept within a reasonable level and it is perhaps best to aim for a better than average yield rather than the maximum yield.

Grain Quality Assessment

Due to a delayed harvest as a result of significant rainfall on the windrowed crop, the bulk sample of Barley only went feed quality.

A hand sample of grain however was taken in the standing crop prior to windrowing and the grain quality results are given in the following table.

	HIF	HIB	DPB	DPF
Protein %	12.5	14.4	11.5	10.5
Moisture %	11.6	11.6	12.9	11.1
Quality	Feed	Feed	Malt 2	Malt 1

Discussion

The higher protein content in the grain produced under the high input regime resulted in a lower quality grain. This difference in quality has not been reflected in the gross margin analysis presented earlier, however if it was to be taken into account, the advantage in gross margin for the district practice treatments by comparison to the high input treatments becomes even greater.

Soil Analysis

A representative soil sample was taken from the trial site in February 1999, to assess the level of residual nutrients in the soil following the Barley crop. The results are presented in the following table.

	High input	Comments	District Practice	Comments
pH (water)	5.9	Moderately acid	5.8	Moderately acid
PH (CaCl2)	5.2		5.1	
Aluminium	<10 mg/kg	Low & harmless	<10	Low & harmless
ECe	1.6 ds/m	May harm sensitive species	0.17 ds/m	Suitable for most species
Total soluble salts	0.06 % w/w	Slightly higher than normal	0.05 % w/w	Slightly higher than normal
Phosphorus (Olsen)	27 mg/kg	High	9 mg/kg	Low and deficient
Potassium (Skene)	740 mg/kg	High	590 mg/kg	High
Sulphur	12 mg/kg	Moderate	6 mg/kg	Marginal
Ca:Mg Ratio	1.6	Unfavourable for structure	1.2	Unfavourable for structure
Dry aggregate slaking		Water stable		Water stable
Dry aggregate dispersion		Nil		Nil
Remoulded aggregate dispersion		Strong		Strong

Discussion

The results clearly indicate:

- More salts in the high input soil which can be detrimental to some plants
- Significantly higher residual phosphorus and potassium in the high input soil, along with higher levels of sulphur
- A soil structural problem in both soil types indicating a need for gypsum and possibly lime.
- A crop could be grown in the high input soil with minimal fertiliser input in 1999, whereas significant fertiliser input would be required for the district practice treatment.