4.7 EVALUATION OF DEEP BANDING FERTILISER PLACEMENT

Location: Lochiel, Ross - Tasmania

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Growing season rainfall:
April – November inclusive: ~ 450 mm

Background:
Fertiliser utilization and placement within the cropping system presents an opportunity for research and development that can have significant payoffs in terms of increased production, improved profitability and long term sustainability. Global emphasis has shifted from increasing crop yields from continued increases in fertilizer application rates. Instead, emphasis has been placed on fertiliser systems where increases in crop production are obtained from reduction of nutrient losses within the cropping system and a less than proportional increase in fertiliser nutrient use.

The trial site has been selected to explore fertiliser regimes in low rainfall situations.

Aim:
To compare 5 fertiliser application regimes commonly used in barley in replicated trial

Treatments:
1. No fertiliser at sowing; no top-dressing with N
2. DAP (125 kg/ha) at sowing; no top-dressing with N
3. DAP (62.5 kg/ha) at sowing; DAP (62.5 kg/ha) deep banded; no top-dressing with N
4. DAP (125 kg/ha) at sowing; UREA (50 kg/ha) deep banded; no top-dressing with N
5. DAP (125 kg/ha) at sowing; top-dressing with N (UREA 100 kg/ha)

Sowing Date: 22/06/2001
Seeding Rate: 80 kg/ha
Harvest date: 10/01/2002
Fertiliser used:
DAP (14:18:0:4) 125 kg/ha
Urea 50 kg/ha deep banded
100 kg/ha top dressed

Weed control:
Pre-sowing Goal (50 ml/ha)
Roundup CT (1.5 l/ha)
Post emergent MCPA (1.5 l/ha)
Ally 5 g/ha

Results:

Treatment	Crop Height cm	Average Yield tonnes/ha	Protein
1. No fertiliser	97.7	5.49	8.9
2. 125 kg/ha DAP at sowing	102.7	5.86	8.9
3. 125 kg/ha DAP (half deep banded)	105.0	5.54	8.8
4. 125 kg/ha DAP with seed PLUS UREA 50 kg/ha deep banded	108.3	6.47	9.3
5. 125 kg/ha DAP at sowing, 100 kg/ha UREA top dressed	110.0	6.54	9.6
lsd	6.08	0.71	

Crop vigour as measured by average height of the crop clearly shows the effect of adding fertiliser to the system. While the height differences between no fertiliser treatment and 125 kg/ha DAP demonstrate a trend, they are not significantly different. All other treatments are significantly greater than the nil treatment. No significant difference can be detected between treatments 2 & 3, so fertiliser placement is not a significant predictor of crop height. Deep banding DAP at sowing had the effect of increasing crop vigour. However, conventional placement of fertiliser produced higher average yields in this trial. Variations between these plots are such that the results are not significant.

The addition of Nitrogen (treatments 4 and 5) did have a marked effect on average yield, with yields of 6.5 tonnes per hectare (an increase of 18% over nil treatment) being achieved. Protein levels also improved with increased nitrogen (pooled result). Treatments 4 (50 kg/ha Urea deep banded) and 5 (100 kg/ha top-dressed) produced similar results. While the result of these treatments is significantly different from the nil fertiliser treatment, there are no significant differences between these Urea treatments. This suggests that the placement of urea at depth (10 cm) improves the efficiency of nutrient uptake. Further research on nutrient uptake and losses to the system are needed to confirm this effect.

Conclusions:
Application of DAP fertiliser at time of sowing improves yield in barley. Application of additional nitrogen lifts yields further, and improves protein levels in the grain. Results suggest efficiencies in nitrogen application can be achieved with placement in the root zone compared to surface application. Further work needs to be undertaken to better understand the process.