Project Catalyst

Case study

Richard Hobbs trials applying reduced nitrogen rates following sun hemp fallow crop

Grower Name: Richard Hobbs
Entity Name: Hobb RE
Mill Area: Victoria
Total Farm Area: 75ha
Area under Cane: 70ha
No. Years Farming: 30
Trial Subdistrict: Sunny Bank

Growers participating in Project Catalyst trials worked with economists from the Department of Agriculture and Fisheries to provide data that was analysed to identify the costs, revenues and profitability of the trials.

In this study, Richard Hobbs and HCPSL trialled applying reduced Nitrogen (N) rates following sunn hemp as a fallow crop. Economists measured profitability to compare the treatments.

Richard Hobbs

TRIAL DESIGN

A randomised strip trial was established in 2017 on Richard Hobbs' property located in the Herbert. The plant crop was harvested in 2018. To determine the impact of applying reduced N rates following a sunn hemp fallow, the trial compared four different N rate treatments. Each treatment had three replicates.

All treatments received 18 kg N/ha when planting and then additional N was applied later. Table 1 shows the amount of N applied to each treatment at each stage and the total N.

KEY FINDINGS

- The highest average gross margin was achieved with the 18N kg/ha treatment but there were no statistically significant differences in yield, CCS or gross margin between treatments.
- The lower N rates performed as well as the higher N rates indicating that the sunn hemp fallow reduced N fertiliser requirements in plant cane.

	18N	43N	68N	93N
Plant N rate	18	18	18	18
Side dress N	0	25	50	75
Total N rate	18	43	68	93

Table 1: Treatment N application rates (kg/ha)

COSTS

Fallow costs were the same between treatments and amounted to $195/ha. Figure 1 shows a breakdown of the average variable costs for each treatment in the plant cane. The only plant cane growing cost differences between treatments were due to the amount of N applied. For example, the treatment with the highest N application rate had the highest variable costs. Harvesting costs and levies varied between treatments as these costs were dependent on harvested cane yield. All other costs were the same between treatments.

What it's about

Project Catalyst is a grower-led innovation project in sugar cane that was formed to explore and validate farm management practice change leading to improved water quality for the Great Barrier Reef. For more information on Project Catalyst please visit our website https://www.projectcatalyst.net.au/ or phone Catchment Solutions on 07 4968 4216.

RESULTS

Table 2 presents the average cane yield and CCS results for each N rate. Differences in cane yield and CCS between treatments were not statistically significant and therefore could not confidently be attributed to the different treatments.

Figure 2 presents the average gross margins for each treatment (revenue less variable costs). The 18 kg N/ha treatment obtained the highest average gross margin. A statistical analysis of the economic results indicated that the differences in gross margin were not statistically significant and therefore could not confidently be attributed to the different treatments.

CONCLUSION

Although soil N levels were not determined during the trial, it was expected that a sunn hemp fallow would maintain cane yields on the subsequent plant crop despite applying a lower rate of N. In this trial, the lower N rates performed as well as the higher N rates indicating that the sunn hemp fallow reduced N fertiliser requirements in plant cane. This requires further validation but suggests that a sunn hemp fallow may help reduce the demand for N in the following plant cane crop and increase returns to the grower. A control treatment with a bare fallow (usual practice) could help validate the effect of a sunn hemp fallow.

For more information on the economic analysis please contact Tichaona Pfumayaramba via phone (07) 3330 4507 or email Tichaona.Pfumayaramba@daf.qld.gov.au

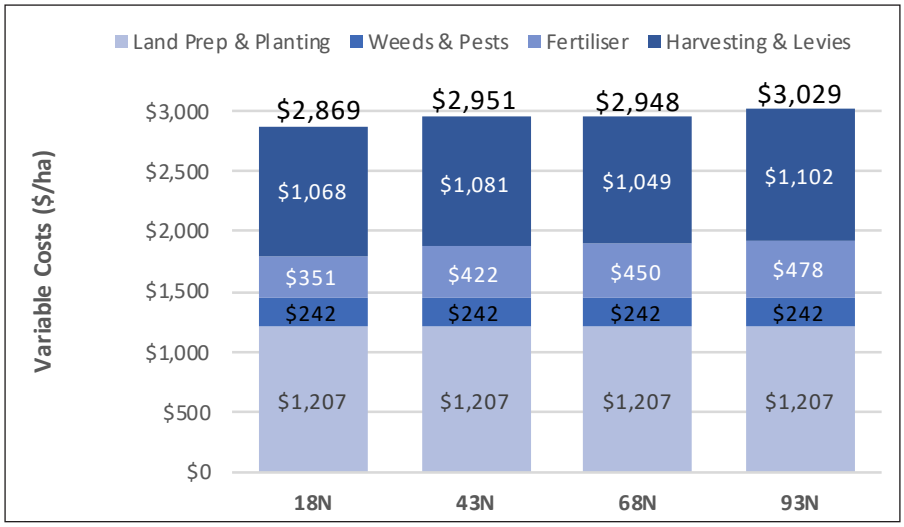

Figure 1: Variable cost breakdown – plant cane

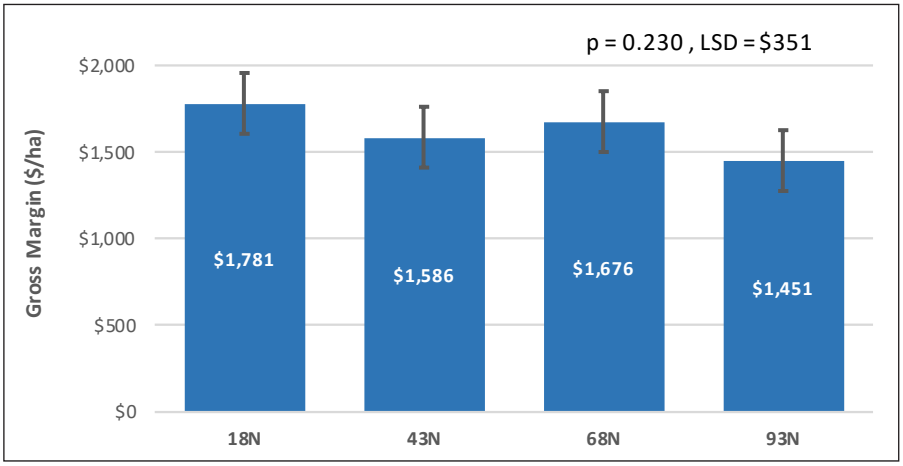

Figure 2: Average gross margin in plant cane – error bars indicate 95% least significant difference (overlapping bars indicate no significant difference).

	18N	43N	68N	93N	p-value
Cane yield, tc/ha	118	119	116	122	0.105
CCS, units	14.2	13.9	14.3	13.5	0.170
Total N rate, kg/ha	18	43	68	93	

Table 2: Average cane yield and CCS results

Note: The trial results are specific to this grower, paddock and prevailing conditions

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