HIGH INPUT CROPPING: A VIABLE OPTION

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INTRODUCTION.

It is accepted among agronomists that the problems of soil acidity and declining fertility must be addressed if farming is to be both profitable and sustainable in the medium to long term One way to address these concerns is to increase gross margins and to use a portion of the increase to improve long term soil fertility. For growers to adopt such a strategy requires the demonstration of the fact that lime and increased fertiliser application can not only increase gross margins in one season but can provide benefits over a full rotation. This poster reports on the current status of a project commenced in 1994 and designed to demonstrate these benefits over a 10 year rotation (5 year crop and 5 year pasture).

METHODS

Two similar paddocks on the college farm at Dookie in Victoria, were selected in 1994 for this trial. Paddock 40, was entering the pasture phase (pH (water) 5.1 Olsen P 8 mg/kg) and paddock 4 (pH(water) 5.1 Olsen P 10) the cropping phase of the 10 year rotation (5 years pasture and 5 years cropping) used on the college farm. Each paddock was divided in half, the north half was limed and will receive high fertiliser inputs over a full rotation and the south half is to be managed using typical fertiliser inputs for the Dookie region. Lime will be applied to achieve a target pH of 6.0 by 1998 (5 t/ha, was applied in 1994). Phosphorus application is intended to replace P removed and to build up soil Olsen P levels to 25 mg/kg over 5 years. To achieve this 30 kg P/ha as super phosphate (9.1% P and 11.5%S) will be top-dressed annually onto pasture and 40 kg P as either MAP (22%P, 10%N, 2.3%S) or DAP (20%P, 18%N, 2%S) will be drilled the all crops. Nitrogen as urea (48% N) will be applied to non-legume crops at between 50 and 150 kg N/ha depending on the crop and season. Annual measurements include pasture yield or stocking rate, crop yields and quality and gross margins for each half of the two paddocks. Soil analysis will be conducted annually to monitor changes in soil fertility and soil health will be assessed every 2 years.

RESULTS AND DISCUSSION

Due to the sever drought in 1994 no pasture data was collected and both paddocks were stocked at the same rate. In 1995 pasture on the high input half of paddock 40 was visibly better than the low input half. Both halves were cut for hay and the yields and gross margins will be presented in the poster. Paddock 4 was sown to wheat in 1994 and a total of 50 kg N was applied as urea. Despite the drought the high input half gave higher yield, water use efficiency (WUE), and gross margins. This result was encouraging considering the severe drought conditions experienced in 1994. Results are presented in table 1. The paddock was sown to wheat in 1995 and visual differences between the two halves, have been apparent since the three leaf stage. Results from the 1995 harvest will be included in the poster.

Table 1 Wheat responses to high fertiliser inputs in a drought year (1994)

Paddock 4	Yield (t/ha)	Protein (%)	WUE (kg/mm)	Gross Margin ($/ha)
High Input	1.9	12	20	148
Low Input	1.1	11.8	12.2	45

Even in a drought year high fertiliser inputs increased WUE from 12 kg/mm (15 kg P/ha and 15 kg N/ha) to 20 kg/mm, (40 kg P/ha and 50 kg N/ha.), the theoretical maximum. Yields and gross margins were also increased by 100 $/ha despite the higher input costs.

CONCLUSION

The limited results from 1994 for wheat indicate that even in drought conditions high input strategies can increase WUE and yields while significantly increasing profits. This trial will be continued to determine the long term effect on gross margins and soil fertility of a high input fertiliser strategy over a 10 year pasture/crop rotation.

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