

## Impact of payment for quality on nitrogen recommendations for wheat

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The premium currently offered in world markets for higher protein wheat is likely to be reflected in payments to growers (1). This study aims to determine if farmers can economically increase the protein content of the wheat they produce. Results of preliminary trials carried out by CSBP & Farmers Ltd suggest that it is likely to be profitable to modify fertiliser programmes to take advantage of premium payments.

### Methods

Ten trials were established in the central, eastern and south—east wheatbelt of Western Australia in 1986, 1987 and 1988. Most sites had a high yield potential despite a low soil nitrogen status. Each experiment comprised 5 rates of applied nitrogen up to 80kg N/ha. Basal phosphorus was applied in all cases and nitrogen applied at seeding. For higher rates a split application was made with the second application within six weeks of seeding. Plots were mechanically harvested and protein levels determined by Kjeldahl nitrogen analysis of air dried grain.

### Results and discussion

A quadratic nitrogen response curve was fitted to the yield and protein data for each trial and the economically optimum nitrogen fertiliser rate determined under a range of payment options. For wheat valued at \$130/t and nitrogen fertiliser \$0.65/kg the optimum economic rate of application ranged from 14kgN/ha to 72kgN/ha with a mean of 41kgN/ha. At optimum N, yield ranged from 0.70t/ha to 3.57t/ha and protein from 8.8% to 13.1%.

Assuming a base price for wheat of \$125/t and a premium of \$3/t per percent protein above 8%, the optimum economic rate of nitrogen is increased by 6kgN/ha. This results in a slight increase in average yield and a 0.4% increase in average protein levels (Table 1).

**Table 1: Effect of a protein premium on nitrogen fertiliser, rates, yield and grain protein**

	Optimum nitrogen rate (kgN/ha)	Yield (t/ha)	Protein (%)
No protein payment	41	2.43	10.6
With protein payment	47	2.46	11.0

Given the assumed protein payment scheme, the average opportunity cost of failing to adjust nitrogen fertiliser rates was \$1/ha in these trials. Although small, this represents a 25% net return on the investment in nitrogen fertiliser.

In order to capitalise on protein premiums nitrogen rates needed to be increased between 2 and 16kgN/ha. The range highlights a need for further research into factors affecting the responsiveness of protein levels to nitrogen fertilisers so that payment for protein can be quantitatively incorporated into nitrogen fertiliser recommendation models.

1. Condon, C. (1989). The Land, February 2 p16