

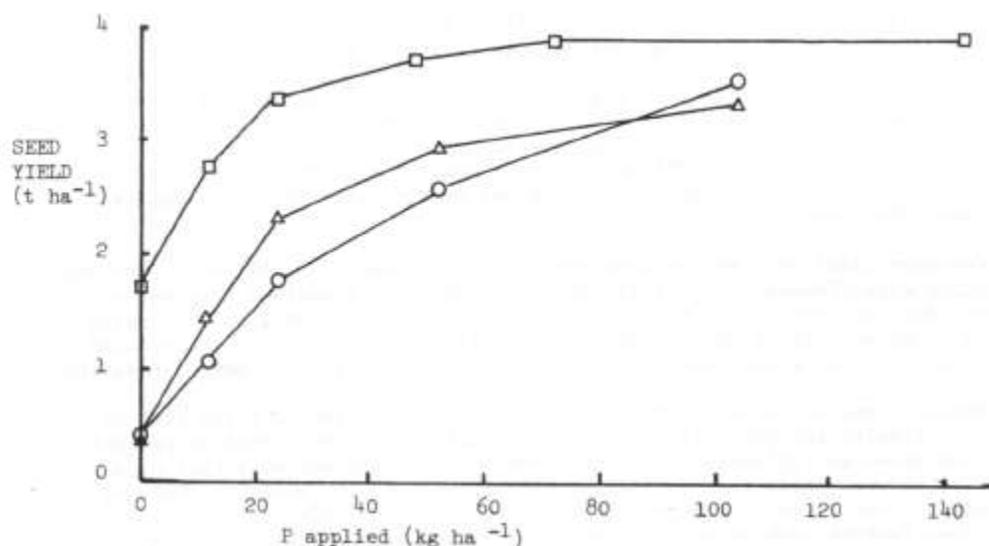
## Response of raingrown soybeans to rate and placement of superphosphate on low-P soils

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A major proportion of raingrown soybeans in coastal N.S.W. is grown on light-textured, acidic soils low in nitrogen and phosphorus in the natural state. These crops are drilled in narrow rows (18 to 36 cm apart) and superphosphate is broadcast prior to sowing usually at 125-250 kg ha<sup>-1</sup>.

A series of experiments on a shale derived, podzolic soil (pH 5. 5-8 ppm available P bicarb.) is studying the effects of superphosphate rate and placement on the yield of Bragg soybeans. Fertilizer was either broadcast and mixed, or drilled in bands 18 cm apart but isolated from the seed. Rates used in 1977/78 were 0, 12, 24, 52 and 104 kg P ha<sup>-1</sup>, and in 1978/79 0, 12, 24, 48, 72 and 144 kg P ha<sup>-1</sup>. All treatments received 125 kg ha<sup>-1</sup> of potassium sulphate.



**Figure 1. Response of soybeans to phosphorus fertiliser applied either broadcast 1977/78 (○----○) or banded (△----△) and mean of broadcast and banded in 1978/79 (□----□).**

Differences in yield between placement methods were not significant ( $p < 0.05$ ) at any phosphorus rate in 1978/79. There was a significant ( $p < 0.05$ ) mean response in this season to increased P levels up to 48 kg ha<sup>-1</sup> (Fig. 1). In 1977/78 there were significant ( $p < 0.05$ ) yield increases by banding rather than broadcasting fertilizer at 12, 24 and 52 kg P ha<sup>-1</sup>, and for each increment of P up to 52 kg ha<sup>-1</sup> within each placement method. Responses in the two seasons probably reflect the different soil moisture levels, dry in 1977/78 and adequate in 1978/79.

These results suggest that, where available soil phosphorus is low, large increases in soybean yields can be achieved by raising superphosphate rates up to 500-550 kg ha<sup>-1</sup> and, where narrow row cultivation is practised, that banding rather than broadcasting fertilizer will increase efficiency, especially in drier seasons.