Effect of mung beans on soil mineral nitrogen on the eastern Darling Downs.

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Intensive cropping has resulted in a marked decline in the nitrogen status of black earth soils of the Eastern Darling Downs. Fertility maintenance by means of legume leys is not economically viable in this area and complete reliance on fertilizers as a nitrogen source for crops is expensive.

Grain legumes have been proposed as alternative suppliers of nitrogen for cereals. This paper reports an investigation of the effect of black and green grams *(Vigna mungo* and *V. radiata* respectively), commonly called mung beans, on the supply of mineral nitrogen for a subsequent sorghum crop.

Plots of the two legumes were grown during the summer of 1977-78 on a Waco black earth, and additional plots of sorghum and fallow were included for comparison. At maturity all grain was harvested, the residue ploughed in and the plots maintained as fallow until sorghum was sown over the entire area, with three rates of nitrogen fertilizer in 1978.

The tops of all crops in 1977-78 contained 74-80 kg N/ha including 45, 46 and 25 kg N/ha in the grain of black gram, green gram and sorghum respectively. Sorghum thoroughly depleted soil mineral nitrogen and mineralization after this crop was slow (Table 1). In contrast, both legumes caused less nitrogen depletion, and mineral nitrogen contents at the end of the fallow exceeded those present initially.

TABLE 1. Soil mineral nitrogen content (kg/ha) in profile 0-120 cm for the various treatments.

Treatment	At planting	At harvest	After fallow (May-Oct.)
Black gram	69	30	98
Green gram	67	42	109
Sorghum	76	4	41
Fallow	78	140	178
L.S.D. (P =0.05)	28	18	17

The 1978-79 sorghum crop responded markedly to the prior treatments, and yields and responses to applied nitrogen reflected the mineral nitrogen levels at planting. The water supply for this crop was non-limiting. The prior crops of both grams had an effect on yield at least equal to that of a current application of 68 kg N/ha.

This work indicates that mung beans can have a marked effect on soil mineral nitrogen and on the nutrition of a following crop.