

## EFFECTS OF PHOSPHORUS FERTILIZER ON ROOT AND SHOOT GROWTH IN COMMON BEANS

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A field experiment of common bean was grown on a red latosol low in phosphorus, near Goiânia, Goiás, Brazil. It was conducted during the raining season (November to February, 1981), and no water deficit occurred. The sources of phosphorus in the treatments were single superphosphate and rock phosphate (Araxá phosphate). It was used 60 kg/ha of  $P_2O_5$ , 15 kg/ha of N as ammonium sulphate and 15 kg/ha of  $K_2O$  as potassium chloride. The soil moisture, root density and shoot dry weight were taken weekly from flowering to maturity period. No differences were observed in soil moisture between plots of different source of phosphorus fertilizers. The means of soil moisture during the period studied were 24.30%, 24.90%, 25.30%, 25.40%, 26.40% and 26.57% at depths of 0-15, 15-30, 30-45, 45-60, 60-75 and 75-90 cm, respectively.

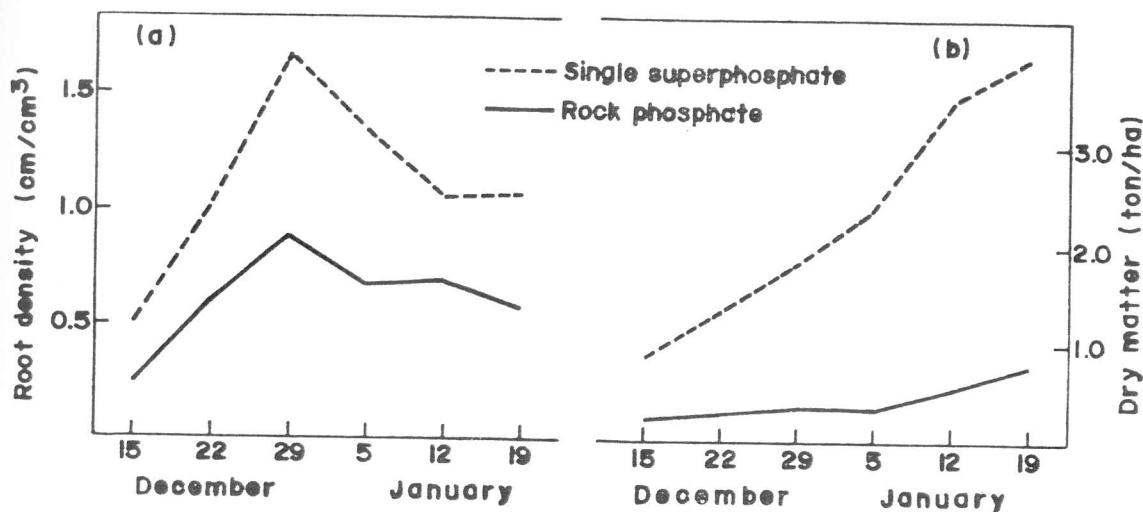


Fig. 1. The effects of single superphosphate and rock phosphate on (a) root density and (b) shoot dry weight.

Figure 1 (a) shows the effects of single superphosphate and rock phosphate on the means of root density from surface level to a depth of 90 cm during the last 6 weeks of the plant cycle. The root density was much higher when single superphosphate was used but showed the same response over the time. In figure 1 (b) it can be seen that the rate of shoot dry weight increased at a much higher rate when single superphosphate was used than when rock phosphate was used. The equation:  $\text{Roots} = 0.25136 + 0.085427 \text{ shoots} - 0.001656 \text{ shoots}^2$  describes the relationship between root density and shoot dry weight.

On the basis of these results rock phosphate (araxá) can not be recommended for beans in areas where available soil phosphorus is low.