Nutrient limitations on yield and quality of peanuts grown in four soils from the Kingaroy area - II molybdenum

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A nutrient omission trial (Jones and Crack 1970) to examine nutrient limitations on peanut yield and quality was conducted in a glasshouse using four soils, viz. cultivated and uncultivated krasnozem (C.K. and U.K.) and cultivated and uncultivated red earth (C.R.E. and U.R.E.). This paper reports the effect of molybdenum omission on the yield of tops and fruit and quality of fruit by comparison with a "complete" treatment in which all nutrients tested were applied.

TABLE l. Dry weight (g/box) of peanut tops and fruits

SOIL	Tops			Fruits		
	"Complete"	-Mo	LSD (P=0.05)	"Complete"	-Mo	LSD (P=0.05)
C.K.	195.3	100.3	41.2	106.3	106.9	53.1
U.K.	178.3	151.7	40.4	155.1	159.9	50.6
C.R.E.	142.0	183.7	38.3	152.7	119.5	54.1
U.R.E.	161.0	136.3	38.9	154.5	145.8	53.0

Symptoms of nitrogen deficiency, apparently due to inadequate nitrogen fixation, indicating low molybdenum supply to Rhizobium (Reid and Cox 1973) were observed on peanut plants growing in the minus molybdenum treatments on both the C.K. and C.R.E. The symptoms appeared at 6 weeks from emergence on peanuts growing in the C.K. and were severe after 10 weeks from emergence. The symptoms appeared later on the plants grown in the C.R.E. The increase in tops yield of plants grown in the minus molybdenum treatment on the C.R.E. was due to one high yielding replicate, which, if rejected would have given a mean yield not significantly different from the "complete" treatment. Quality of peanut fruit was reduced by molybdenum omission on both C.K. and C.R.E., though total fruit yield was unaffected. Yield of sound mature kernels was reduced on the C.K. and C.R.E. and on the C.K. yield of poor quality kernels increased. The proportion of total fruit yield recovered as sound mature kernels was reduced on both C.K. (from 30% in the "complete" to 11% in the minus molybdenum treatment) and C.R.E. (from 39% to 35%). There were no responses to molybdenum omission on the uncultivated soils. These data indicate that peanut fruit quality is more sensitive to low soil molybdenum status than is total fruit yield. Soil pH was measured on 33 field sites for each of C.K. and C.R.E. About 35% of these soils had a pH below 5.5, the level normally associated with reduced molybdenum availability (Buckman and Brady 1970). Thus crops grown on these soils may benefit from molybdenum application. In addition, some soils with a pH above 5.5 may also need molybdenum - as was the case with the C.K. soil used in the present trial.

Buckman, H.Q. and Brady, N.C. (1970). "The Nature and Properties of Soils" 7th Ed. (Macmillan, London).

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Reid, P.H. and Cox, F.R. (1973). "Peanuts - Culture and Uses". Amer. Peanut Res. and Educ. Assoc.