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EFFECT OF FRITTED TRACE ELEMENTS ON THE YIELD, OIL AND PROTEIN CONTENTS OF PEANUTS, *ARACHIS HYPOGEA* L - VAR AK 62, ON EBINI SANDY LOAM, GUYANA

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No work has been done on the 'brown sands' of Guyana to determine the effect of trace elements on peanuts. It is known that trace elements especially molybdenum and copper affect both the quantity and quality of peanut production (Harris 1959). Stark *et al* (1959) has suggested that for proper utilisation of the 'brown sands' trace elements are essential. The investigation reported here was to obtain information on the effect of trace elements, in a fritted form, on peanuts.

MATERIALS AND METHODS

SOIL: This investigation was done during the short season of 1968 -69 (Nov. - Jan.) and the long wet season of 1969 (May - August) on Ebini sandy loam. The soil is a Red-yellow podzol (Typic normochrult), drained and of low water holding capacity. Some physical and chemical properties of, the top 15 cms are presented in table 1.

Table 1. Some physical and chemical properties of the top 15 cms of Ebini sandy loam.

pH	Truog-P (ppm)	Total N %	PBS	m.e./100 g				%		
				Exch. K	Exch. Ca	Exch. Mg	CEC	Sand	Silt	Clay
5.3	1.1	0.04	61	0.02	0.30	0.30	1.22	60	24	16

The experiments were of a randomised block design with four treatments and six replicates. The treatments were o, 22, 44 and 66 kg/ha of F.T.E. 503*, applied at planting. F.T.E. 503 is guaranteed to provide the following minimum quantities of trace elements, Boron, (B_2O_3),9.75%; Copper (CuO), 3.75%; Iron (Fe_2O_3), 25.70%; Manganese, (MnO) 9.50%; Molybdenum (MoO_3), 0.30%; and Zinc (ZnO), 8.75%. All plots received 325 kg/ha 13-33-16 and 8.0 kg/ha MgO (as kieserite) at planting plus 8.0 kg/ha MgO and 55 kg/ha N (as ammonium sulphate) at 35 days after. Gypsum (504 kg/ha) - was applied to the rows at flowering.

Savannah grass (*Tracchypogon plumosus*) which was present on the site, was disced into the soil two months previous to the start of the first experiment. Dolomitic limestone (1650 kg/ha) was applied two weeks before the first experiment was planted to bring the soil pH to about 6.5. No limestone was applied for the second experiment which was on the same site.

Peanuts were sown at a distance of 60 cm. between rows and 20 cm within the row in plots 6 m x 3 m. Where necessary plants were thinned to two per hole. Plants were sprayed wekly with zinc-propylene-bis-dithiocarbamate (Antracol) after they were two weeks old, for protection against leaf-spot (*Cercospora sp*).

Plants were harvested, the border rows discarded and weights of sun-dried pods per plot recorded. Samples from each plot were taken for oil and protein analysis.

Pods were shelled and the nuts ground in a stainless steel mill. Separate samples of the ground nuts were then analysed for oil and protein contents according to the A.O.A.C. Handbook (1955).

*With the compliments of Ferro Corporation. Agric. Chemicals.

All results were statistically analysed following Steel and Torrie (1960).

RESULTS AND DISCUSSION

The results of yield for both experiments and percent oil and protein for experiment two are presented in table 2.

Table 2. Effect of varying levels of F.T.E. 503 on yield, percent protein and oil of peanuts - Var. AK 62.

kg/ha F.T.E. 503	Expt. 1	Expt. 2		
	Yield (kg/ha)	Yield (kg/ha)	%Oil	% Protein
0	508 a	1466 a	38.1 a	27.5 a
22.0	559 a	1597 ab	39.6 a	26.8 a
44.0	549 a	1833 a	40.0 a	27.7 a
66.0	559 a	1718 bc	41.0 a	27.6 a

Values in the same vertical columns, followed by the same letter are not significantly different at 5% level.

Application of trace elements had no effect on yield in experiment 1. There was a significant response to trace elements in experiment 2. The response was linear but showed signs of curvature, with no further yield increase was obtained after 44 kg/ha F.T.E. 503 was applied.

The failure to obtain a response in the first experiment may have been to the generally low yields. At such low yields there were probably more serious limiting factors than that under study, which therefore could not manifest itself.

The better yields in the second experiment may have been due to greater rainfall during the period - cm compared to 32 cm. and or a build up of active Rhizobia in the soil.

Trace elements had no effect on the oil content. However, because of their positive effect on yield of pods, yield of oil also increased with the application of up to 44 kg/ha F.T.E. 503.

Percentage portein was not affected by the application or trace elements.

It could be concluded from this investigation that 44 kg/ha of F.T.E. 503 or of a similar formulation is about optimum for peanuts, Var AK 62, on Ebini sandy loam. Effects of the trace elements will only be seen when there are no other limiting factors.

Protein and oil contents are unaffected by trace elements.

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