

CHROMIUM EFFECTS ON AVOCADO TREES

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(Low concentrations in cultures proved beneficial to growth.)

The literature on chromium contains numerous references regarding the benefit of low concentrations of chromium on the growth of various plants. When, however, citrus trees in South Africa were planted on soils containing considerable chromium, the growth was accompanied by symptoms of injury. Thus far no reference has been found of the possible beneficial action that low concentrations of chromium might have on the growth of avocado trees.

The purpose of the present study was to determine whether chromium in low concentrations would be of benefit in the growth of avocado trees. To this end, Harman (Mex.) avocado seedlings were planted on December 13, 1954, in three-gallon-capacity soil cultures in the glasshouse. Distilled water and chemically pure salts were used and each soil culture was provided with excellent drainage.

The nutrient solution used was that of Hoagland's (A,B,C, stock solutions) containing the following trace elements: .2 ppm—parts per million—boron as boric acid, manganese as sulfate, iron as repurified ferrous sulfate, 1 ppm zinc as sulfate, 3 ppm aluminum as citrate, .1 ppm copper as sulfate and 5 ppm molybdenum as sodium molybdate. At the time of applying the first nutrient solution the cultures were arranged in descending order of their growth, the largest culture being retained as the control. The chromium concentrations employed were added to the nutrient solutions each time they were applied to the soil. The chromium concentrations used were: 0, .0125, .025, .05, .075, and .30 ppm as potassium -chromate.

The cultures were grown until June 16, 1955, at which time they were photographed. Figure 1 and the data in table 1 indicate the beneficial effect of chromium on the growth of avocado seedlings in soil cultures when the nutrient solution always contained a given concentration of chromium as potassium chromate.



Fig. 1. Stimulating effect of the addition of chromium to the nutrient solution whenever nutrient applications were made to three-gallon-capacity soil cultures planted to Harman (Mex.) avocado seedlings in the glasshouse. Left to right: 0, .0125, .025, .05, .075, and .30 ppm chromium as potassium chromate.

Table 1. Stimulation in the growth of Harman (Mex.) avocado seedlings in three-gallon-capacity soil cultures to which were applied a nutrient solution containing at all times various concentrations of chromium as potassium chromate. Cultures grown from December 13, 1954, to June 13, 1955.

Culture No.	Chromium in nutrient solution (ppm)	Leaves, fresh weight (grams)	Trunk, fresh weight (grams)	Trunk height (inches)	Root, dry weight (grams)
1	0	80	57	34.5	20.9
2	.0125	115	108	55.3	21.7
3	.025	135	102	56.0	24.7
4	.05	112	119	59.8	19.3
5	.075	133	88	51.8	19.0
6	.30	127	97	49.8	25.8