Table 1

Crystal No.	Atmosphere during growth	α (cm.$^{-1}$)	τ (μsec).
177	Vacuum 2×10^{-4} mm.	1·1	2
181	Vacuum 8×10^{-4} mm.	1·25	10
166	Vacuum 3×10^{-3} mm.	1·5	12
148	Vacuum 5×10^{-3} mm.	1·75	13
150	Argon and water vapour	6·0	20

recombination centre X which can either be nullified by chemical interaction with the oxygen or which competes with oxygen for a place in the lattice. The nature of X is not known at present, but it is suggested that X might be an interstitial silicon atom, frozen into the lattice during the crystal-growing process[4].

Kaiser[5] has shown recently that a suitable heat treatment can lead to the production of donor centres the distribution of which along the crystal can be correlated with the amount of oxygen present. It is intended to extend the present work to an investigation into the relationship between heat-treatment effects, life-time, oxygen content and dislocation density. A more complete account of the experimental techniques and results will be given elsewhere.

In the present results, the value of the absorption coefficient, α, in cm.$^{-1}$ at 9μ is taken as a measure of the oxygen content. In the calculation of α, background absorption due to free carriers has been allowed for, because of its dependence on resistivity.

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Boron in the Glasshouse Tomato Plant

DATA concerning the boron content of the glasshouse tomato plant were required in connexion with an investigation of a fruit condition known as 'bronzing'. Negligible information on this subject is to be found in the standard references[1-3]. The boron contents of the tomato plant presented in the following tables may, therefore, prove useful in future diagnostic work.

In the pot experiment three rooting media were employed: (1) silver sand; (2) compost No. 1 prepared from a local steamed soil; (3) compost No. 2 prepared from a glasshouse soil, where 'bronzing' has been a problem, and two tomato varieties—Anti-mold A and Ailsa Craig. One series of three pots per variety was irrigated with a complete nutrient solution containing 2 p.p.m. of boron and an identical series with a nutrient solution minus boron (except for 'starter' doses of the solution containing boron given to the silver-sand pots). All treatments were replicated twice. Boron was determined colorimetrically in the laboratory on the fruit and associated leaves, all determinations being carried out in duplicate. A summary of the results is given in Table 1.

Table 1. POT EXPERIMENT 1956: GLASSHOUSE TOMATO PLANTS (Boron expressed as p.p.m. on a dry matter basis)

Sampling month and stage of growth	Leaf analysis			Fruit analysis		
	Complete nutrients	Minus boron S.S.	Minus boron C.	Complete nutrients	Minus boron S.S.	Minus boron C.
July 1st truss ripening	82	26	48	14	3	8
Early August 2nd and 3rd trusses ripening	41	16	33	8	4	8
Late August 4th and 5th trusses ripening	18	5	14	5	No fruit	4

S.S., Silver sand; C, compost

Typical boron deficiency symptoms[2,3] were observed only in the tomato plants grown in silver sand and irrigated with 'minus boron' nutrient solution. Both the composts were able to supply sufficient boron to their plants.

Table 2 presents the boron contents for samples taken from tomato plants on various commercial nurseries in the north of England over the period 1954–56.

Table 2. ANALYSES OF HERBAGE SAMPLES TAKEN FROM TOMATO PLANTS ON VARIOUS COMMERCIAL NURSERIES, 1954–56 (Boron in parts per million on a dry matter basis)

Month of sampling	Leaves	No. of samples	Fruit	No. of samples
June	55	18	14	20
July	58	19	14	19
August	22	4	8	8

Three points of interest emerge from this work.

(1) Boron deficiency is unlikely to be of economic importance in the tomato plant. This confirms the conclusion of independent investigations[2,4].

(2) The values presented in certain standard references are high compared with those obtained in this investigation. Goodall and Gregory[1], quoting work undertaken by Eaton[4] in the United States, abstracts the following values:

Boron in p.p.m. (on a dry matter basis) in plants *not* showing symptoms of boron deficiency

Period	Leaves	Fruit	Plant
July–August	34–150	24–27	29–78

Wallace[3] gives a value of 46 p.p.m. boron for healthy tomato leaves, which compares favourably with the values in the above tables.

(3) Boron contents decrease markedly as the season progresses.

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