

(b) *Effect of Compost, Charcoal, &c., on Tomato Yield.*—In view of the high percentage of clay and silt in the Nelson soil used for tomato-production it was considered that such materials as compost, charcoal, sawdust, and sand might beneficially affect both growth of tomatoes and quality of fruit. With this in view certain plots in the glass-house were treated after steaming with steamed compost (stack bottom) or sawdust from *Pinus insignis* at the rate of 30 tons per acre, with charcoal (derived from New Zealand beech) at the rate of 30 tons per acre, and with coarse river sand at the rate of 300 tons per acre. In each case the material, after spreading, was forked into the top 8 in. of soil. The usual fertilizer programme was given to all these plots, but the one treated with sawdust owing to the appearance of marked nitrogen-deficiency symptoms received an additional supplement of nitrogen equivalent to that contained in the base fertilizer.

The use of sand was associated with earlier growth of the plants, while sawdust very definitely retarded growth. The steamed compost gave the best all-round result, with charcoal in second place.

The following table shows the average yield of tomatoes from the different treatments :—

Treatment.						Yield of Tomatoes, per Plant.	
						lb.	oz.
Steamed compost	..	..	..	..	..	8	14½
Charcoal	..	..	..	..	..	8	10½
Sand	..	..	..	..	..	7	4
Sawdust	..	..	..	..	..	6	5
Control (average of seven plots)	..	..	..	..	..	7	7

The yield data show the marked benefit which has been obtained on the Institute soil from the use of both steamed compost (stack bottom) and charcoal and the detrimental effect, in the first season at any rate, from the use of sawdust (*Pinus insignis*). Although the use of sand appeared promising in the early stages, yield of tomatoes was not improved on the glasshouse soil over that of the control plots. A similar experiment conducted on outside tomatoes, however, showed considerable increase in yield from the use of coarse sand at the same rate.

(c) *Effect of Different Rates of Watering on Yield of Tomatoes.*—This year the differences in yield of tomatoes from the steam sterilized plots watered at three different rates were not so pronounced as last year, but again the highest yield was associated with the heaviest rate of watering and the lowest yield with half-standard rate of watering. Averaged over a period of three years the heaviest rate of watering (two W.) gave 9 lb. per plant, the standard rate (W.) 8½ lb. per plant, while the lowest rate of watering (half W.) gave 8 lb. per plant.

(d) *Tomato "Cloud."*—The Dreadnought variety was again tested under different conditions in the Institute glasshouse. Individual records were kept of some 260 plants under different treatments, including steam sterilization, use of fertilizers, different rates of watering, and use of different soil amendments. Unfortunately, the percentage of "cloud" in the tomatoes was very low, the average for all plots being 3·8 per cent., compared with 14·1 per cent. in the previous season. It would appear that the dry weather experienced in December, January, and February and a drier condition of soil, particularly in the early part of the season, were mainly responsible for the reduction in "cloud" this year.

(e) *Tests of Steam and Soil Disinfectants on Outside Tomato Soil.*—Chloropicrin, formalin, and steam have again been tested for the treatment of outside tomato soil. Early in the season, steaming, the use of chloropicrin (36 ml. per square yard), and the use of 2 per cent. formalin solution showed to advantage in superior growth of the tomato plants. Formalin 1 per cent. solution came next, while the control plots lagged behind. This advantage in growth was maintained throughout the season, particularly