

11.8 lb. per plant, but the quality of fruit was not equal to that of E.S.5. The Invincible variety gave fruit of good size, shape, and quality. The crop, however, was late, and the yield of 9.4 lb. per plant was considerably below that of Potentate.

The E.S.5 variety did better than in the previous year: the yield of 11.1 lb. per plant was good, and the quality of the tomatoes was excellent, but a rather high proportion of small fruit was a disadvantage. The E.S.1 variety was the least satisfactory of the varieties tested.

The above varieties, together with Hall's, Hutt Special (Kidson), and Kondine, were tested under outside conditions of culture on two different soils. Dry weather militated against the best results being obtained, particularly in one garden where watering of the plants was not possible.

The highest yield in these field tests was obtained with Hutt Special (6.4 lb.) and Kondine (6.3 lb.), followed by Queen (5.3 lb.). Other varieties ranged in yield from 5.1 lb. to 5.3 lb. per plant. Potentate (New Zealand), with a yield of 4.8 lb. per plant, gave the poorest result.

Quality of tomatoes was best with Invincible, Mayland Beauty, Hall's, and E.S.5; and poorest with Queen and Potentate.

"HARD-CORE" INVESTIGATIONS

Further evidence has been obtained concerning the importance of chloropicrin and of potassic manures in reducing the amount of "hard-core" in tomatoes grown on Nelson soil. The results of the past season's work on "hard-core" are discussed below.

Effect of Chloropicrin and D-D on "Hard Core." Two experiments on somewhat different types of soil in the grounds of the Institute (Nelson) were conducted, using chloropicrin for soil disinfection in one experiment and D-D as well as chloropicrin in the other experiment.

In the first experiment, chloropicrin was used at the rate of 36 c.c. per square yard on a number of plots treated in previous years in different ways, and corresponding plots without chloropicrin treatment were available for comparison. Determinations of "hard-core" in Kondine tomatoes grown on the experimental plots showed, over the six comparisons that were available, a reduction in the amount of commercial "hard-core" of 44 per cent. on the plots treated with chloropicrin. The average percentage of "hard-core" was 24 per cent. on the chloropicrin plots and 68 per cent. on the plots without soil disinfectant.

The previous treatment of the plots influenced to some extent the final result obtained with chloropicrin. Thus plots treated previously with cocoa-bean husks showed the least "hard-core" (14 per cent.), compared with 36 per cent. "hard-core" in plots receiving in previous years only standard fertilizer.

In a second experiment, carried out on a soil not so conducive to "hard-core," replicated plots were treated with chloropicrin, D-D, compost, and mulch respectively. Each plot received the same fertilizer mixture. Both chloropicrin and D-D proved beneficial in reducing "hard-core," but compost and mulch had little if any effect.

Effect of Potash, Lime, &c., on "Hard-core." Plots were available with heavy dressings of potassic manures (1 ton sulphate of potash per acre), of slaked lime (2 tons per acre), and sulphur (2 tons per acre). In each case a standard fertilizer was used over all plots, and determinations of "hard-core" were made at a favourable opportunity during the harvest season. The soil on which the experiment was conducted was known to be associated with a high percentage of "hard-core" in tomatoes.

The results showed the following percentages of commercial "hard-core" with the different treatments: heavy potash, 12 per cent.; lime, 30 per cent.; sulphur, 46 per cent.; control, 47 per cent. The "heavy-potash" plot had received additional