

and these were applied by a unit similar to that shown in Fig. 12. This unit worked in the same way as the one described earlier in the article. From each bin two tubes led down to the back of the spear heads, and the fertiliser was applied to the soil immediately behind the spear heads. The sweeps on the rear of the tractor mixed and distributed the fertiliser thoroughly through the topsoil. This method of applying fertiliser was found more economic and satisfactory than hand methods, and quantities of up to 1 ton an acre could be applied. All the initial marking out and application of fertiliser for the tomato crop was done with these machines, the spear heads being set 14in. apart and the sweeps not being used at all. The fertiliser was applied to the soil at the back of the spear head and the two spear heads formed a small low ridge of earth which was sufficient to enable the planter to set out the young tomato plant. No damage resulted to the plants from fertiliser burn, as the fertiliser was placed 7in. away from the centre of the ridge formed.

For best results only a small application of fertiliser was found necessary when setting out the plants and, although the total quantity given to the crop ranged from 15 to 30cwt. an acre, this was given as several side dressings during the crops' growth.

It must be clearly understood that the cultivation methods described in this article were used only in vegetable crops, but all the cultivation equipment could be put into almost any field crop. A noticeable feature in all the illustrations is the absence of weed growth, which has resulted from sound cultivation practices up to the seedling stage and subsequent inter-row cultivation. It may be concluded from the illustrations that this district is free from weeds, but Fig. 16 shows clearly the weed growth in a crop not cultivated efficiently and eventually abandoned in this district. One attempt had been made to wheel hoe this crop and the few visible rows of onions showing are the result of that wheel hoeing.

Improvements on Existing Methods

Any method which reduces the width of the crop row required for tractor cultivation should be considered and one way of doing this is shown in Fig. 17.

The wheel shown is known as the "tip-toe" wheel and has proved most satisfactory. With the knowledge gained from experience at Patumahoe it may be possible to reduce the row width which can be intercultivated from 21 to 15in. This would be the ideal, as very little loss of production would result from crops grown in this row width.

A still greater degree of mechanisation for cultivating farm crops will be



Upper—Sweeps at the rear of the tractor to loosen up and level out the soil behind the spear-head cultivator. Lower—Spear heads working in a bean crop, showing the depth of cultivation and the distance from the row.