

cultivated land can be made. Cultivation in April on lea land with the object of sowing in September–October allows weathering and sweetening to take place, and this is absolutely essential where such a depth of soil is tilled and aerated for the first time. The weathering reduces the clods, and plenty of time elapses to rot the turf and make it available for the crop. It was a noticeable fact with the dry spring experienced that the gyrotilled potato crops held out better than others, while it was also said that drainage was better during the heavy rains following. Yields from the tilled land are most encouraging, and will probably average 15 tons an acre. Certified seed was sown in practically all the gyrotilled land, with superphosphate 3 cwt. an acre and sulphate of ammonia 1 cwt. an acre as the manure.

Outside the Waimate district the cultivation was carried out mostly with the object of putting the ground into swedes, turnips, and rape. Oats, however, were sown on some tilled land with fair success. Some excellent crops of swedes have been obtained where the work was carried out in early winter. As the machine has worked north and the season progressed, the results fall away, and some very poor crops are to be seen. It is noticeable, however, that in some cases where a certain amount of cultivation had been done prior to late gyrotilling the resultant crops are quite good, although the crop varies considerably from the sides to the centre of each width of the machine. The cause of this is that the rotary tynes have a tendency to bring up unweathered soil from below to the centre and transfer all the good soil to the outside edges of each width of the machine. This gives a crop, where the tilling has been done late, an undulating appearance. This feature is not noticeable in the Waimate district.

#### LESSONS FROM THE EXPERIENCE.

The lessons to be learnt from the first year's working of the gyrotiller in South Canterbury are as follows:—

(1) Cultivation for any crop on any class of land should be carried out as early as possible. The following is suggested for crops following lea:—

If tilling is carried out for wheat in January or February, previous top-work can be dispensed with. After these months, tilling should be done only on land that has been skimmed or "hustled" earlier. No tilling should be done later than the middle of April. If rain fell on this later tilling it would be impossible to sow the wheat in the winter of that year because the land after tilling lies very open and cannot carry either horses or tractor for some considerable time. For potatoes and oats direct tilling should be done only up to the end of May. After that, tilling should not be done unless the top-work has been carried out earlier. In this case the tilling should be completed before the end of June. For rape, turnips, and swedes direct tilling can be done up to the end of July, and after that only on previously worked land up to the end of August.

(2) Direct late-tilling for any crop on a lea field has resulted, in the main, in the failure of the crop. This can be attributed to—

- (a) The mixing of unweathered soil with the topsoil and consequent temporary sourness;
- (b) Lack of consolidation due to the stirring and opening-up of a considerable depth of soil;