generally to be spring sown after turnips and after potatoes, unless these are dug early. Spring sowing of wheat is confined mostly to areas of good land, and districts with a relatively high rainfall offer the best promise of success. The lighter plains land of Canterbury, where 20 to 30 bushels an acre is an average yield, is not suited to spring sowings of wheat.

Seeding for Wheat

The type of soil, the time of sowing, and the quality of the grain are the three principal factors which influence the seeding rate per acre. On the medium and good wheat land of Canterbury the seeding rate for autumn wheat usually varies between 1½ bushels and 2 bushels per acre, the heavier seeding being used mainly nearer the hills, where there is a higher rainfall. On the lighter and drier soils a seeding rate between 1¾ and 1½ bushels per acre is common. As wheat sown in the spring has not the opportunity to tiller to the same extent as autumn-sown wheat, heavier sowings are the rule with spring wheat, 2 bushels to 2¼ bushels per acre usually being sown.

The quality of the grain also affects the seeding rate per acre. Seed wheat which has been slightly sprouted or which contains chipped or broken grain needs to be sown at a heavier rate than well-developed wheat which has been machine dressed. The Department of Agriculture instituted a scheme some years ago for the certification of all the more important varieties of wheat grown in New Zealand. This enables growers to obtain lines for sowing which are relatively free from diseases and foreign varieties.

Manuring of Wheat

During the past 20 years a large number of wheat-manuring experiments has been conducted by the Department of Agriculture in the main wheat-growing areas of the Dominion, but more particularly in Canterbury. The results of these comprehensive trials may be summarised as follows:—

(a) An application of 1cwt. of superphosphate increased the average yield by 4.1 bushels per acre.

(b) An application of 1cwt. of serpentine superphosphate gave a result equivalent to 1cwt. of superphosphate.

(c) Other forms of phosphate such as ephos, Nauru, and basic superphosphate gave a result inferior to either superphosphate or serpentine superphosphate.

(d) Increasing the superphosphate application from 1cwt. to 2cwt. per acre resulted in an average yield increase of only 0.2 bushels per acre. The larger application cannot, therefore, be recommended.

(e) The use of potash in association with superphosphate did not prove profitable.

(f) The use of carbonate of lime with superphosphate gave indifferent results, and the use of the mixture could not be generally recommended.

(g) The use of a nitrogenous manure, such as sulphate of ammonia, could not be generally recommended, although an application of 1cwt. per acre in the spring may be profitable with crops having a yellow and unthrifty appearance and showing general symptoms of nitrogen starvation.

The manuring of wheat in New Zealand today is based very largely on the results of the trials mentioned. Most farmers drill 1cwt. of superphosphate or 1cwt. of serpentine superphosphate per acre down the coulters when sowing their crops. An increase of 4 bushels per acre as a result of using either of these phosphatic fertilisers would not only be profitable to the farmer, but, based on an average sowing of 250,000 acres, it would also represent an increase in the Dominion's total of about 1,000,000 bushels annually.

After Cultivation

The treatment the wheat crop receives after drilling is influenced largely by the variety sown, the soil type, and the kind of weather experienced during the winter. In a normal season the majority of farmers would harrow their crops once with tine harrows—usually in September—and then follow immediately with the Cambridge roller. The object of the harrowing is to break any surface crust which may have formed as a result of winter rains. The rolling breaks any clods still remaining, packs the fine soil around the young wheat plants, and provides a smoother surface for harvesting operations, particularly on stony ground.

During a mild winter with very little rain the soil may remain open and friable, and harrowing would then be necessary only to kill weeds. With a very wet winter, however, the reverse is often the case, especially on a clayey soil. The soil may pack down very hard and become so consolidated that it is extremely difficult to provide a surface tilth. In some cases crops may be harrowed two or three times, or the grain drill with the coulters down may be used in an endeavour to provide a surface tilth.

It is a common practice in Canterbury to sow down to grass in a wheat crop. The grass and clover mixture is either drilled or broadcast in the spring either before harrowing and rolling or between harrowing and rolling.

Grazing of Wheat

Farmers sometimes graze their wheat in the spring because of a shortage of sheep feed, but wheat is generally grazed with sheep only in certain districts and then only in seasons when there appears a danger of the wheat growing very rank and eventually lodging. Lodging makes harvesting operations more difficult; wheat which grows rank is also prone to develop mildew, and badly-mildewed wheat usually means a poor-quality grain. The greatly increased sowings in recent years of the short-strawed Cross 7 variety no doubt explain why there has been a considerable reduction in the acreage of longer-strawed wheat it has been necessary to graze because of rank growth.

Grazing is probably practised most frequently in areas of very good land of the sandy loam type. On the heavier clay type of soil grazing is less frequent, as the trampling of the sheep tends to encourage cracking of the ground should a dry spell occur.

The use of a large mob of sheep to obtain rapid and even grazing is recognised as the best method of grazing wheat. Probably more farmers would graze wheat if they had large enough flocks to graze it off quickly and evenly.

Sacks of wheat as dropped in the harvest field by the header harvester.