

row, resulting in a heavy application of water and a consequent bogging of the land. With autumn-sown crops the land consolidates sufficiently during the winter and early spring, but with the earlier harvesting of autumn-sown crops irrigation water as a rule is not required. If it is given, it frequently induces second growth in barley, oats, and peas. Field crops have been, and are, successfully irrigated in Central Otago from contour races where land has a fairly good fall, but this is the exception more than the rule.

**5. Furrow method.** Annual crops are, however, grown well under the furrow system of irrigation. They are grown in drills and the water is run down between them. Potatoes, mangolds, swedes, carrots, and maize for greenfeed are regularly grown in this way in Central Otago, and this method will undoubtedly have a place in Mid-Canterbury.

In the preceding irrigation methods irrigation water flows over the land and soaks down through it. In furrow irrigation the water flows along between the drills and travels sideways and upwards as well as downwards in the soil. In the actual furrow one quickly gets the fourth stage of wetness described later to at least the depth of the ploughed soil. Then, by capillary action, the water moves sideways into the drill. Small volumes of water are used on a number of drills simultaneously. In a dry spring the land frequently dries out during the working and erection of the drills. The seed is sown and the area is irrigated to provide moisture to germinate it. As soon as possible after irrigation, when the furrows will carry a horse, they are scuffled with a horse hoe to mulch the surface, thus checking evaporation.

Furrow irrigation can be used on land with a gentle fall of a few inches per chain when the furrows are made directly up and down the fall of the land, or can be used on relatively steep land with a fall of some feet per chain by continuing the drills or furrows, not up and down the fall of the land, but at a gentle slope across the fall of the land.

**6. Basin-check method.** This method is apparently used more extensively overseas in orchards and in rice production. The writer has seen this method used on only one orchard in Central Otago, where it was quite satisfactory. A check is formed round a tree or a number of trees and the basin thus formed is filled with water.

**7. Overhead.** This is a system of overhead sprays, and an excellent one for irrigation. The writer is aware of only three systems of this type in operation in Central Otago. The limiting factors to its use are the cost of piping the area to be irrigated and



Preparing head-race.



Construction of border for border dike system.



Area prepared for border dike system and ready for sowing clover.