

## ESTABLISHMENT.

In most cases the lucerne-paddocks are ploughed just previous to sowing, from virgin ground which in its natural condition carries about one-third of a sheep to the acre and is but scantily covered with storks-bill (*Erodium cicutarium*), annual fescue (*Festuca myurus*), and poa tussock (*Poa caespitosa*). Where irrigated grass and fescue-tussock (*Festuca novae-zelandiae*) paddocks have been utilized, the ground is broken in the spring and worked up rapidly if for immediate sowing, or fallowed if sowing is held over till the autumn or spring of the following year. On the non-irrigated virgin ground a seed-bed is readily produced, after ploughing, with one stroke of the disk harrow, one with the spring-tooth cultivator, and one with the tine harrow, while sometimes even less cultivation than this is given. Very occasionally paddocks have been roughly graded to assist in the later irrigation or haying, but on the whole it is not the practice to select or work areas to facilitate later management of the crops. From the foregoing it can be seen that successful results follow even where very little labour is expended in producing a seed-bed.

Of the crops 85 per cent. have been spring-sown (September and October), the spring sowings being earlier than in any other part of New Zealand, and the remainder in March. Although the early growth is sometimes retarded by weeds or autumn frosts, recovery is general, and no noticeable difference exists between the established crops of the respective sowings.

Some 59 per cent. of the crops have been pure seedings; 24 per cent. have been sown with oats; and 17 per cent. sown with grass mixtures, red clover, or wheat. When the lucerne is sown with oats (2 bushels per acre) the growth is retarded in the first season, but this method of establishing two crops from the one working and sowing apparently does not affect the final stand of lucerne. This only indicates that in Vincent County, at any rate, lucerne is the easiest of any permanent crop to establish successfully. Where red clover is sown in conjunction with lucerne 2 lb. to 4 lb. of clover-seed is used, and the clover dies out in two to three years. It gives an early and luxuriant growth, but this does not injure the subsequent development of the lucerne. Where sown down with grass (say, 7 lb. lucerne, 8 lb. cocksfoot, 10 lb. rye-grass, and 2 lb. white clover per acre) the aim is to produce a permanent sward with lucerne as the dominant clover, to be used either solely for grazing purposes or for occasional hay-production followed by winter grazing.

Practically the whole of the lucerne crops are broadcasted, with an average seeding of 14 lb. per acre, either by hand or with a hand machine, and tine-harrowed in, as in this dry district comparatively deep burying of the seed is not harmful. The rate of sowing has ranged between 5 lb. and 23 lb. per acre, and even with the lower amount satisfactory stands have resulted. There is a general opinion, however, that from 10 lb. to 14 lb. represents the most suitable quantity to use. Marlborough and Hunter River are the usual varieties sown, and although others have been tried they have not justified their use even for special conditions.

Manuring is not practised, and applications of lime and inoculated soil are uncommon. Where such methods have been adopted the stands of lucerne do not show any improvement over the non-treated