

APPENDIX VI.—SMALL-FARMS SCHEME, NELSON.

PAKIHI DEVELOPMENT, SERGEANT'S HILL, WESTPORT.

(By SIR THEODORE RIGG, K.B.E., Director of the Cawthron Institute.)

During the past year notable progress has been made in the development of pakihi lands at Sergeant's Hill. During the year sowings of grass and clover were completed on the original area of 800 acres comprising the Buller Domain, Archer's, McLellan's, and Mikkelson's Blocks. In addition, a great extension of the developmental-work was authorized on the north side of the main Fairdown Road. The extension of the developmental scheme on the northern side of the Fairdown Road covers Hateley's Block (260 acres), Kelpé's Block (70 acres), and Morris's Block (300 acres). The blocks included in the extension comprise a large proportion of suitable pakihi land, with favourable surface features from the point of view of drainage, establishment of shelter, and location of buildings. In addition, the new areas include certain sandy flats which should be very satisfactory for winter grazing. Good progress has been made in connection with the development of these new areas. Drainage has been completed both on Hateley's and Kelpé's areas, and a start has likewise been made with the systematic drainage of Morris's Block. About 240 acres of typical pakihi land on Hateley's and Kelpé's areas have been sown to grass and clover during the present autumn.

The past season has been excellent for pasture growth, and both autumn and spring sowings of grass and clover have done extremely well. On the older pastures difficulty has been experienced in keeping growth in check, and during the late summer *Lotus major* tended to take charge. The hay crop, covering 55 acres, was outstanding, and yields as high as $2\frac{1}{2}$ tons to 3 tons of hay per acre were harvested from well-established pastures. In all, over 60 tons of hay and 50 tons of ensilage have been put into stack, thereby making ample provision for winter feed on the different areas.

On the whole, the stock grazing the established areas has done very well. Yearling and two-year-old cattle have made excellent gains in live weight and have not been troubled by any ailment. Calves, however, have not done as well as was anticipated, and a considerable number of deaths occurred during the spring and early summer. The available evidence suggests that the most important factor in connection with the mortality of the calves has been cobalt deficiency. Great benefit has already resulted from the use of cobalt drenches and cobalt salt licks. It seems possible, however, that other trace elements, possibly copper, are deficient on some of the pakihi blocks, and optimum health will not be obtained until the full requirements of the calves in all trace elements have been met.

Buller Domain Area.—The 25 acre block laid down by the Cawthron Institute six years ago has given excellent pasture growth during the past season. For the most part, where drainage is satisfactory, there is a good mixture of *Lotus*, white clover, rye, and other grasses in the sward. The hay crops on these old-established pastures were very heavy, averaging $2\frac{1}{2}$ tons to 3 tons of hay per acre. Consolidation on this area has revealed the necessity for further supplementary drains on the flattish areas with a peaty topsoil.

The more recent sowings of March, 1936, on the Buller Domain have come on very well, and during the past year a great improvement was noticeable in the density of the sward and in the dryness of the soil. On the ridges and slopes, where drainage is good, a very satisfactory sole of white clover has been established. *Lotus major*, during the latter part of the season, has dominated on many parts of the Buller Domain, and the number of stock proved inadequate to control this growth.

Archer's Block.—The sowings of March, 1937, have done extremely well during the past summer, and have afforded a great deal of feed for stock during the latter part of the season. The spring sowings of the previous year have been particularly good, enabling the stock to be grazed frequently on this portion of the block. The hay crop on Archer's Block was a very heavy one, and on one field the yield was approximately 3 tons of hay per acre.

McLellan's Block.—The whole of this block, comprising over 130 acres, was sown in March, 1937, and an excellent take of both clovers and grasses was secured. The pasture, both on the terrace lands and on the peaty flats, promises exceedingly well, and should give a large amount of feed during the autumn and early winter.

Mikkelson's Block.—An area of 100 acres was sown in April, 1937, the balance (115 acres) being sown in the following spring. In both cases a very satisfactory strike of grasses and clover was obtained, and good grazing should be available for late autumn and early winter. Mikkelson's Block has a very considerable area of shallow peat, and is not likely to give such a promising result as other parts of the developmental scheme.

Hateley's Block.—This area, comprising 260 acres, was taken in hand during the spring of 1937, when a start was made with drainage. A great deal of work has been involved in securing satisfactory drainage of the sandy flats, owing to the amount of water brought down by streams from the upper pakihi terrace. Much of the drainage-work has now been completed, and the water-table on the sandy flats has been lowered at least 3 ft. Some 180 acres of pakihi terrace has likewise been drained and treated with lime and superphosphate, and then sown to grass and clover. Much of the pakihi terrace has a loamy soil which should give an excellent sward on consolidation.