

Use of Lime.—The small plots sown at different periods during the last five years continue to show the great importance of lime treatment in the establishment of pastures on pakihi land. The use of 1 ton of ground limestone per acre in the initial establishment of pasture still gives very good results and compares quite favourably with plots treated with larger amounts up to 2 tons of ground limestone per acre. In those cases where small dressings only of ground limestone have been given the plots are very much inferior to those with the standard dressing of 1 ton per acre. Poor growth of clovers is now quite marked on plots treated with $\frac{1}{2}$ ton of ground limestone per acre three years ago. In the comparisons which have been made in connection with the use of lime it must be remarked that 5 cwt. of superphosphate per acre was used in each experiment.

Use of Phosphate.—The continuation of the experiments reveals the great importance of top-dressing established pastures each year with superphosphate at the rate of not less than 2 cwt. per acre. Little change has occurred in the relative position of the plots treated with different phosphatic manures. With lime treatment, superphosphate or basic slag gives excellent results. Where lime is omitted Nauru rock phosphate has given very fair growth, *Lotus major* being luxuriant after the first season. Superphosphate without lime treatment has proved of little value.

Use of Potash.—On those plots where a hay crop has been removed each year the use of 1 cwt. of sulphate of potash per acre in addition to superphosphate has maintained yields very satisfactorily. Under grazing conditions it has been noticed that the stock graze more closely the areas on which sulphate of potash has been included in the top-dressing manure.

Drainage Experiments.—Two years ago a small plot was subdivided and provided with tile drains laid at approximately pan level. The land was left to consolidate, and was then disked and sown under the standard conditions which have been used in the majority of the pasture trials. It is interesting to note that on the plots where lime and phosphate were omitted a total failure of pasture resulted. This confirms in a striking manner the conclusion deduced from earlier observations: that the infertility of the pakihi soil for pasture plants is due to high deficiency of lime and phosphate, and not to the supposed water-logging as a result of the pan formation.

Species Trials.—Small plots sown in the previous year with different legumes and grasses have in a number of cases made excellent growth. In these trials, the standard procedure of burning pakihi vegetation, harrowing, and of treatment with 1 ton of ground limestone and 5 cwt. of superphosphate per acre was adopted. Alsike and *Lotus major*, followed by white and red clover, have done extremely well. Grasses when sown alone using the standard treatment outlined previously have given rather poor results. Crested dogstail, Western Wolths, and Timothy, however, show to some advantage in comparison with perennial rye, cocksfoot, and meadow foxtail. Paspalum so far has made very little growth and appears to be at a standstill.

The species plots, and indeed the seed-mixture trials at Sergeant's Hill, show quite definitely the supreme importance of clovers and lotus in the initial establishment of pasture on the pakihis. Perennial rye and the better grasses in the early stages do not contribute greatly to pasture production. After stocking and consolidation of the land, however, a great improvement in the growth of rye, cocksfoot, and other grasses occurs.

Grazing Results.—On one area established four years ago grazing trials have been conducted. During the past season young heifers have been used for grazing this area. The animals have kept in excellent health, and for the full-year period commencing June, 1932, and concluding May, 1933, an area of $1\frac{1}{2}$ acres has provided 362 heifer-days of grazing. This is equivalent on the acre basis to 320 heifer-days per year. In the previous year the same field gave 365 heifer-days per acre. A close sward of clover, lotus, crested dogstail, rye, and other grasses has now been obtained as a result of stocking. The land has consolidated well, and little difficulty has been experienced in holding animals on the land throughout the greater part of the year.

Small-farm Trial.—The 10-acre block, sown in April, 1932, under standard conditions of treatment, has given an excellent result. On this block the vegetation was burnt, and 25 cwt. of ground limestone and 5 cwt. of superphosphate per acre were then distributed. Two harrowings with an improvised set of harrows were then given to aerate somewhat the top inch of soil. A mixture of grasses, clovers, and lotus was sown at the rate of 35 lb. per acre. The cost of establishment is as follows:—

	Cost of Establishment per Acre.		
	£	s.	d.
25 cwt. ground limestone	1	5 0
5 cwt. superphosphate	1	5 0
Cartage of lime and superphosphate	0	11 4
Distribution of lime	0	15 0
Distribution of superphosphate	0	3 6
35 lb. seed mixture	1	9 9
Sowing seed	0	2 0
Harrowing	0	7 6
Burning pakihi vegetation and removing timber	0	6 0
Total	£6	5 1

NOTE.—Since the 10-acre block was sown drains have been dug to take off surface water from low-lying locations and also to prevent storm-water from higher ground gaining access to the 10-acre block. This work involved an additional outlay of approximately 12s. per acre. The cost of fencing is not included in the above statement.