

CLASSIFICATION OF PASTURE LANDS



[Sparrow Industrial Pictures Ltd. photo.]

The preparation of a seed-bed for grass. Large areas of New Zealand's 8 million acres of grassland sown after ploughing were established before supplies of Certified pasture seeds were available, and probably a third of the area, even under regular topdressing, is not capable of maximum production unless the swards are renewed and high-producing strains of perennial ryegrass and white clover introduced. Large areas of class 4 land should be broken up and resown on a fine, firm, moist, and warm seed-bed.

sown after being ploughed. The total area of grassland topdressed in the Dominion has risen from 1½ million acres in 1927 to 4½ million acres in 1947.

FERTILISER AND LIME USAGE, 1927-1947

Year	Total fertiliser usage (thousands of tons)	Total production of agricultural lime (thousands of tons)	Total area topdressed with fertilisers and/or lime (thousands of acres)
1927	292		1,521
1928	392	183	1,952
1929	465	222	2,758
1930	526	205	2,651
1931	403	171	2,871
1932	360	202	2,454
1933	403	192	2,438
1934	376	262	2,249
1935	373	289	2,684
1936	426	317	2,882
1937	503	411	3,326
1938	611	482	3,874
1939	614	391	4,017
1940	673	594	4,187
1941	699	728	4,649
1942	502	613	4,212
1943	362	753	3,470
1944	285	904	3,370
1945	430	813	3,646
1946	507	930	3,653
1947	620	1,021	4,259

Topdressing with phosphatic fertilisers began in the early 1880's in the Waikato, where the rainfall is high and the soils are of good moisture-holding capacity but naturally deficient in phosphates. Conditions generally were unsuitable for the production of cereals and rotational farming was unprofitable. Intensive grassland farming was impossible without the raising of the fertility level of the soils. Experiments showed that topdressing with superphosphate, bone-

dust, and phosphatic guanos brought about a vigorous white clover growth which might be used as the basis of milk- and meat-producing pastures. Basic slag became an important fertiliser for topdressing in the early 1900's, but was largely displaced by superphosphate after 1920.

Most soils, except the most immature, require lime in addition to phosphates, and lime usage rose from less than 200,000 tons in the 1920's to more than 1,000,000 tons in 1947. Theoretically, liming where necessary should precede or accompany phosphatic dressings, but in the history of land improvement phosphates generally have been used first and have provided the revenue for liming. Young and unleached soils are very responsive to superphosphate, but on mature and leached soils liming is necessary before superphosphate is effective; it was on such soils that large quantities of basic slag and rock phosphates were used effectively in the absence of liming, though on most soils they would have been more effective with lime. Even if not fully efficient, they gave very payable results in increased clover growth, and part of the revenue earned was then reinvested in liming and more phosphatic topdressing.

In addition to lime and phosphates, potash is required by certain soils to maintain vigorous white clover growth; important potash-deficient areas are Waihi and parts of Taranaki and the Waikato. Potash has an effect similar to that of phosphates and lime: It enables white clover to grow vigorously, and if white clover grows vigorously, the grasses will also grow.

Thus, on most soils of this land class a study of both fertiliser and lime requirements and the moisture-holding capacity of the soil is necessary. Therefore the land improver must study carefully the soil he intends to improve and first be certain that the quantities of fertilisers and lime required for improvement will give an economic return and that the moisture-holding capacity of the soil is satisfactory. Locality experience (amplified by the results of Departmental trials) is the best guide in this direction.

Apart from the lands capable of improvement through irrigation, the two main areas of land in class 4 awaiting the hands of land improvers are, first, land now carrying pastures below the production level which is possible through the use of improved strains of grasses and clovers and not excessive applications of lime and fertilisers; and, second, land in scrub and fern.

Very large areas of the Dominion's 8 million acres of grassland sown after ploughing were established before supplies of Certified pasture seeds were available, and large areas (up to a third in intensively-farmed districts) are not capable, even under regular topdressing, of maximum production unless the swards are renewed and high-producing strains of perennial ryegrass and white clover are introduced. It is from these pasture lands that an immediate increase in primary production might be obtained through pasture renewal.

There are three main renewal methods: Surface cultivation followed by the broadcasting of seed and fertiliser; ploughing and direct reseedling; and sowing to grass after a fodder crop. Again the type of soil largely determines the most satisfactory method. Surface cultivation and seeding succeeds only where the surface soil when lightly broken affords a satisfactory seed-bed; it is most successful in light, moist soils, but may not be at all satisfactory on pastures with a complete turf which the surface cultivator does not open up sufficiently or where the surface soil is hard and cultivation is inadequate. Direct reseedling after ploughing is quite satisfactory if the work of seed-bed preparation has been thorough and the seed-bed has consolidated sufficiently to allow a good strike of white clover. If the seed-bed is not consolidated, white clover will not establish, and without white clover perennial ryegrass will not be vigorous; where the white clover strike has been poor the pasture may require 2 or 3 years to regain its former productivity.

On light land seed-bed consolidation is assisted greatly by rolling of the land on the furrow after ploughing and rolling well before and after sowing; on heavy land natural consolidation must be allowed and a complete summer fallow is usually necessary to bring this about.

The most general and satisfactory method is to plough and take a fodder crop for winter and early-spring feeding and either to spring sow (where conditions are suitable) after surface working, or to plough, summer fallow, and sow early in the autumn.