

THE SAND-DUNES OF NEW ZEALAND.¹

SAND-DUNES originating from the shore occupy an area of 290,000 acres in the North Island and 24,000 acres in the South Island of New Zealand. Protection

more compact turf-formers. Thus the whole dune-tract is gradually converted to pasture. Great care is necessary to plant uniformly, avoiding the formation of trough-like wind-channels; and "wounds" in the marram or turf must be attended to at once.



Photo.

FIG. 1.—Interior of Plantation on Dunes, New Brighton, chiefly *Pinus insignis*.

[L. Cockayne.]

The proper use of dune-tracts is, however, in Dr. Cockayne's opinion, for the growth of valuable trees. *Pinus insignis* is stated to be the most suitable. These should be planted from 2½ to 3½ feet apart. In Germany, generally speaking, marram grass is only used for the foredune; while immediately in its lee the planting of trees takes place without any preliminary fixing by sand-binding plants, the sand being, however, partially fixed by a network of sand-fences consisting of upright sticks. In France the area behind the foredune has been converted to forest, not by planting, but by sowing.

Measurements of the rate of march of a dune are always useful. The following case is given in the report. The position of a wandering dune in the Kaipara district, Auckland, was determined in

against inroads of the sea is not a pressing matter in New Zealand, but protection of fertile lands from burial by marching dunes is, and it is for the latter purpose that the dunes have to be fixed. With this object in view, the Sand-drift Act of 1908 was passed. By it the Minister of Lands is empowered to cause operations to be undertaken for controlling sand-drift within a proclaimed area, the cost being apportioned among the owners of land within that area. The order is subject to appeal to the local magistrate, the final decision resting with a board consisting of the magistrate and two assessors, one appointed by the Government, the other by the local authority.

The rainfall of New Zealand being ample, it is only necessary for the first stage of reclamation to select a plant which can withstand the impact of driving sand and adjust itself to a rising surface. The best of all is the marram grass (*Ammophila arenaria*). Practical directions for planting are given in the report. This plant has little value for grazing, and farmers are warned that it is impossible to fix the dunes by means of any plant valuable for pasture. When the dune-tract is so fixed by marram grass that the sand no longer drifts, the grass dies off in patches. Here pasture grasses may be sown, e.g. Yorkshire fog and clovers, to be replaced later by

¹ Report on the Dune-areas of New Zealand: their Geology, Botany, and Reclamation. By Dr. L. Cockayne. (Wellington, 1911.)

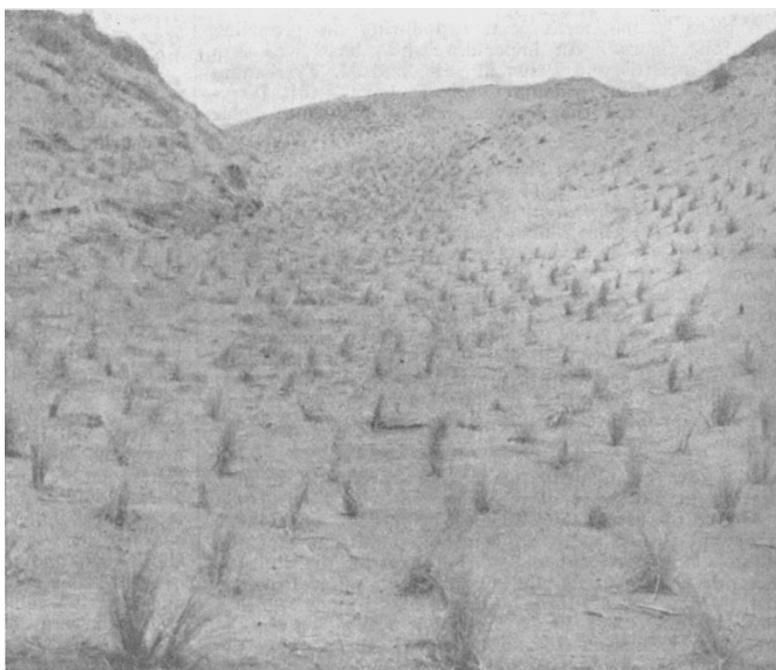


Photo.]

FIG. 2.—Successful planting of Marram Grass in a Wind Channel. Plants rather too far apart. Cliff-dunes south of Manukau Harbour.

[L. Cockayne.]

1866. By the end of 1910 it had advanced 132 yards, i.e. 9 feet per annum.

Dr. Cockayne's valuable report contains a list of seventy-four papers bearing upon the subject of the sand-dunes of New Zealand.

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