

in the expectation that the close planting of this belt will arrest the inland drift of sand from the beach, and eventually form a regular fore-dune. The planting that will later on be done to the leeward of this may be either lupin or marram-grass planted wider apart. Owing to the exigencies of other work it was late in the spring before the planting started, and as the season turned out very dry it was decided at the end of September to postpone further work till this autumn. Another reason, besides the dry weather, for suspending work was that the katipo spider was becoming very active, and one or two of the men were severely bitten. The length of the belt planted was 50 chains.

On a visit paid to the locality in the summer I found that the plantation, on the whole, was doing very well, though there were patches where the marram had failed, and these will have to be replanted this autumn.

The balance (160 chains) of the contract will be finished this coming season.

TAURIKURA BEACH, WHANGAREI HEADS.

At this locality the sand from a narrow strip of Crown land along the beach had, owing to the continued prevalence of north-easterly winds, drifted on to some valuable low-lying grazing-lands and stopped up the main drain, with the result that the grazing-land got flooded, and was made useless. Under the circumstances the Government agreed to share with the owner of the land the expense of planting with marram some 10 acres of the sand near the drain.

As there is no marram growing anywhere near the locality it had to be purchased in Waiuku, sent by steamer to Onehunga, from there to Auckland, and from Auckland by steamer to Craig's Wharf in Whangarei Harbour. As the state of the road was too bad to allow carting to Taurikura Beach, and as further delay might have been fatal to the grass, I had to hire a small cutter and take the grass round to the beach by sea; and by means of a small punt it was landed on the beach after a lot of trouble. I gave precise instructions as to the planting, and I have since heard that, in spite of the lateness of the season, it has taken well, and, though only seven months old, is to some not inconsiderable extent stopping the drift near the site of the drain.

WORKS PROPOSED FOR 1914.

On Run 24 it is proposed to continue the 6-chain closely planted belt to the southern boundary of the Crown land, a distance of nearly two miles. A length of four and a half miles of the coast-line will then be made safe, and the future reclamation inland will be less expensive. At the Waikato Heads a belt similar to the one at the mouth of the Rangitikei will be planted; it will start near the north head and extend northerly along the shore one mile. The following season this belt will be extended along the coast. With the sand at the foreshore held secure it will be possible to reclaim the sand to the leeward with less expense.

Next to the wind, one of the most adverse factors one has to deal with in dune-reclamation in New Zealand is rabbits, for not only are these pests always disturbing the surface, but they prevent the use of several plants that might but for their presence be used as valuable auxiliaries to marram and tree-lupin; in fact, at Waiuku they are very destructive to young lupins. If trees be grown it will be necessary to preserve them by rabbit-proof fences.

In addition to these works directly conducted by the Department, lessees of certain runs on the Wellington west coast will, by special condition of lease, do reclamation-work under departmental direction.

Public bodies and private owners who have sand-areas under their control or in their possession are also given advice how to treat drifting sand in order to prevent its encroachment.

APPENDIX V.—LAND DRAINAGE OPERATIONS.

REPORT BY J. B. THOMPSON, LAND DRAINAGE ENGINEER.

THE Land Drainage Board has been kept busy during the past year with matters pertaining to land-drainage and river-protective works generally.

Special reports and examinations were made in connection with Kaitaia Swamp drainage, Monavale Swamp drainage, Manaku water-supply, and other works.

Inspections were made of works constructed by local authorities out of Government grants, and subsidies and vouchers totalling £3,497 0s. 6d. were made out and certified for payment through the Treasury. Plans in the above connection were also approved as sent forward.

The following work has been done in connection with the undermentioned grants, &c.:—

Hauraki Plains, Construction Roads and Drains on Crown Land Adjoining.—Some eight miles of roads were completed within the Waitakaruru Loan Block, and in addition some five miles of drains. Expenditure during the year was £1,226 5s. 8d., and out of Land for Settlement Account, £926 10s. 1d.

Hauraki Plains: Part Cost Formation Road from Waikaka to Piako River to give Access to Crown Settlers outside Hauraki Plains Settlement.—This is a vote to assist in the construction of Waikaka Tramway Road. One mile of drain was constructed, and road-formation was commenced early in the year. Fascines had to be laid to ensure a solid formation. Trucks were built, and have been used in ballasting some 1,600 cubic yards of spoil which has been put down. Expenditure during the year was £547 2s. 4d.