

here has been killed; so if this work is to be persevered with it will be necessary to replant the area where the grass has failed. It may be stated that private planters in this district have had the same misfortune.

WAIKATO HEADS.

During the last winter a belt 1 mile long and 6 chains wide (48 acres) was planted with marram at the north Waikato Head. The contract was let to Mr. J. H. Herrold (who was the only one who tendered) for £300. The bunches of marram were planted 2 ft. apart, or about 10,900 to the acre. It must be stated that in this case all the marram had to be carted about twelve miles along the beach from Waipipi.

Though this dune is reported to be one of the worst in New Zealand, it is pleasing to say that the marram has taken very well there. This is probably largely attributable to the fact of the sand having a higher specific gravity than that at Rangitikei; and also the rainfall is greater. However, though the grass has taken very well, the heavy gales of the spring caused the sea to undercut the bank just at the mouth of the river, and though a rough kind of retaining-wall of manuka-boughs was built to protect the bank, and a short groyne of stout manuka poles erected down to low-water mark, they have proved ineffective, and the erosion on my last visit was still going on. Protection at this point could be ensured if a pile groyne were built about 60 chains up the river from the mouth, so as to deflect the current to the south side of the Heads, but it would cost more money than the circumstances warrant, so it has been decided not to attempt to stop the erosion, but to run the chance of the current reverting to its former course on the south side. Whether this occur or not, reclamation-work may be continued up the coast and to the rear of the belt planted.

PROPOSALS FOR THE FUTURE.

Run 24, Rangitikei.

All authorities insist on starting reclamation at the source of the sand-supply. Owing to the lesser expense involved it was decided to treat this dune according to the method adopted in Holland and Belgium—that is, planting marram on the natural surface along the shore. Owing to the occurrence of drought with high winds this treatment has not proved a success at Rangitikei. The surface of the land near the shore is very irregular, being a succession of high mounds. It is now proposed to make sand-catching fences to hold the sand between these mounds and establish a fairly uniform foredune along the coast. As there is no material near at hand with which to build these catching-fences, the operation will be expensive; but this seems better than running the risk of another dry season destroying any grass that might again be planted on the natural surface.

Having effectively held the sand at the shore-line, the planting of marram on the interior can be made much wider, with a consequent lessening of the cost. It is proposed to send down from the Rotorua Nursery a competent man to act as foreman, and he will have under him a small gang of men to start building up the foredune and planting marram to the rear. At the same time a small area in a place secure from sand-drift will be fenced in with rabbit-proof fencing, and some trees sent down from Rotorua Nursery to test their respective merits for growing under local conditions.

Waikato Heads.

To the rear of the marram already established here it is proposed to plant a belt of tree-lupin, and if sufficient marram can be procured at a reasonable cost in the district the belt will be extended up the coast. As the land here rises to an elevation of about 300 ft. it would be too exposed for tree-planting. An attempt, however, will be made to establish suitable grasses on the reclaimed area.

Other Places.

On the Kaipara Coast near Waimauku £100 is going to be spent in aiding the Motutara Domain Board to reclaim a bad part of their grounds.

From the foregoing it will be seen that the Government undertakings in connection with this matter are already fairly considerable, and they are being proceeded with as extensively as finances will permit.

APPENDIX IV.—LAND-DRAINAGE OPERATIONS.

[By J. B. THOMPSON, Chief Drainage Engineer.]

THE Land-drainage Branch has been busily engaged during the past year in attending to matters pertaining to land-drainage and river-protective works generally.

Special inspections, reports, and estimates were made in connection with the following schemes: New River Estuary reclamation; Waikiwi River improvement; river-protective works affecting the Grey, Hokitika, and Kokatahi Rivers, Clandeboye and Barnego Settlements; Poukawa Lake drainage, and Lets Valley Swamp drainage.

Inspections, &c., were made in connection with Tokatoka, Hungahunga, Kawa, Eureka, Upper Mangapiko, Whangamarino, Tuatua-Moana, and Ody's Swamps; Waimatuka River, Kaitangata Lake drainage; water-supplies of Otanomomo and Mamaku; and many other minor works and schemes.

A good deal of work was done by the respective officers in inspecting works performed by local bodies out of Government grants. Plans and specifications for these works were also examined, for approval or otherwise. Vouchers of a total amount of £5,326 8s. 9d. were prepared and certified to for payment to the local bodies through the Treasury.