

The total rainfall at Kerepehi in 1943 was 36.09 in. The wettest month was June, with a rainfall of 6.92 in., and the driest December, with a fall of 0.97 in. The average rainfall at Kerepehi over a period of twenty-seven years is 43.14 in.

Owing to the shortage of labour the Department's maintenance operations have been reduced almost entirely to urgent work. The number of workmen employed has varied between thirty-one and forty-seven. By applying all the labour available and spreading the work over a large part of the year it has been possible to clear the growth from most of the important main drains, but it has not for some time been possible to remove silt or widen and deepen drains where this is required periodically following subsidence of the surrounding swamp. It has become increasingly apparent that without additional labour it will not be possible to overtake this accumulating maintenance-work before farm production is seriously affected. In peat areas under development where the continuation of the soil-forming and pasture-establishment processes depend on the gradual lowering of the ground-water level, the pastures are reverting to swamp growth because it has not been possible to deepen the drains.

Low-water levels resulting from the dry summer revealed the extensive channel silting which has occurred in the improved middle reaches of the Piako River and the Awaiti Canal. Construction and improvement work on these channels was completed eight to fourteen years ago, but no maintenance dredging has been attempted. In recent years *Poa aquatica* has become extensively established in the Piako River and tributary canals, and this plant accumulates silt and prevents it from being scoured out to sea by winter floods. A Priestman dredge now idle at Kerepehi could be usefully employed on channel-maintenance work until a more suitable plant is available. Maintenance dredging cannot be further delayed without loss to capital spent on construction and the growth causing the channel silting can be removed now at considerably less cost than the effect can be dealt with in the future.

At present the only two construction undertakings are the reconstruction of Hauraki Gulf foreshore stop-banks and excavation of the Maukoro Canal. An interesting feature of the work on this canal is the attempt made to regulate the rate of subsidence of the peat along the canal-banks by control of the water-level in the canal. For a distance of some miles this canal is constructed in peat, having originally a maximum depth of about 25 ft. above the mineral subsoil which is found at about high-tide level. To dredge the canal up a 25 ft. rise it has been necessary to raise the water level by means of dams behind the dredge and these dams provide the means of controlling the water-level which is necessary to prevent collapse of the canal-banks and also to prevent the too rapid subsidence of the peat. Under conditions of excessive drainage peat can be turned into a fibrous mass which will be practically useless for agricultural purposes. In the period of about thirty-five years since the first hand-dug drain was constructed on the line of this canal a general subsidence of the land along the banks of the upper canal, amounting to 15 ft., is shown by survey records. For several years the rate of subsidence has been regulated by water-level control, and conditions have been favourable for decomposition of the peat, and pasture is becoming gradually established.

#### EXCAVATORS

Two mechanical excavators have been continuously employed throughout the year. A third machine, which has been employed on defence work since May, 1942, returned to the Hauraki Plains in November, 1943.

*No. 15 Bucyrus Excavator.*—This machine commenced work on the reconstruction of the stop-banks on the foreshore of the Hauraki Gulf on the 12th November, 1941, and by the 31st March, 1944, had completed 5 miles 45 chains of stop-bank. In 276 working-days between the 9th March, 1943, and 31st March, 1944, 82,777 cubic yards of material was placed in 2 miles 55 chains of stop-bank at a cost of 5.7d. per cubic yard.

*No. 16 Bucyrus Excavator* has been employed on the Maukoro Canal. Working up-stream on the right bank from the 5 miles 45 chain peg this machine reached the upper end of the canal at 6 miles 62 chains on Torehape Road in February, 1944, and after a field overhaul continued down-stream on the left bank, widening and deepening the canal and constructing a roadway with the spoil to a distance of 13 chains. The soft state of the canal-banks makes the working-conditions difficult. In 207 working-days the machine excavated 26,987 cubic yards at unit cost of 15.1d.

*No. 31 Ruston Bucyrus 17 Excavator* resumed work on the reconstruction of the Orongo Settlement stop-banks in November, 1943, after an absence of seventeen months on defence work. A total of 85 chains of stop-bank has been reconstructed to date, and in 100 working-days between 5th November, 1943, and 31st March, 1944, 22,170 cubic yards of material was built into 75 chains of stop-bank at cost of 7.0d. per cubic yard.

#### LAND-DEVELOPMENT

Land-development work has been mainly attention to grazing stock, maintenance of drains and fences, and control of noxious weeds and regrowth of scrub. On a total area of 7,000 acres sown in grass there is now depasturing 7,000 sheep and 3,000 bullocks.

A flaxmill has recently been established at Kaihere Landing, and to supply this mill 1,600 tons of natural and planted flax has been cut on Crown land.