

At Waihopo the work is being carried on on what is known as the Bulldog Flat. This contains an area of 800 acres, and is practically all gum-bearing. The land is not of such good quality as the land at the Big Flat, but will nevertheless prove suitable for farming purposes when the digging-works are completed. Here an area of about 4 acres has been dug at a wages-cost of £411, and the estimated value of the gum on July prices amounts to £475, showing a surplus of £64; in addition to this there is the improvement to the land, estimated as before at £10 an acre, which gives a further credit of £40.

The whole of the gum recovered at the Mangawai works has been transported to Auckland, and is stored in the main depot. The gum recovered at Waiharara and Waihopo is being stored locally.

RESULTS SUMMARIZED.

Summarized, the results of the whole of the face-digging works up to the end of the year are: Total wages paid amount to £2,590; total estimated value of gum produced on July prices, £3,122; total improvement to the land on a total of 30 acres at £10 an acre, £300: showing a total credit of £830. After deducting 10 per cent. of the gross returns, which more than covers the administrative cost, there remains a net surplus of over £500, which is considered a liberal margin of safety to set against the estimates of value based on July prices.

IMPROVEMENTS OF LANDS DEALT WITH.

In considering the question of the improved condition and value of the land as a result of the face-digging operations, merely to say that the land is improved does not adequately describe the circumstances of the case. It would be more correct to say that most of the land dealt with, before the digging operations were carried out, was simply a desolate waste, literally riddled with potholes, and of small value save for the gum it contained; while after the land had been turned over, the holes filled in, and the timber and stumps removed it was converted to a condition suitable for permanent and profitable occupation for farming purposes.

KAURI-SWAMP TIMBER OF ECONOMIC VALUE.

Special reference has already been made to the vast amount of timber uncovered in the course of the digging-work. It seems from inquiries and investigations made up to the present that the amount of kauri-gum contained in this long-buried timber is of economic value, and will pay for treatment by scientific processes for the gum and other products it contains. Some important preliminary tests of the kauri-swamp timber have been made by the Dominion Analyst, with what must be regarded as very encouraging results.

A carefully selected average sample of the timber was submitted for investigation soon after work was started at Mangawai, and the following is Dr. Maclaurin's report thereon:—

Kauri-swamp Timber.

16th April, 1915.

THE sample consisted of knots and rough pieces of old kauri timber which had been dug from a swamp. It weighed approximately 27 lb., and for treatment purposes was divided into four portions. These were—(A) Dust and fragments of gum and detached pieces of bark, which comprised about one-tenth of the whole; (B) those portions of wood and bark on which gum was plainly visible, and which were cut out from the larger pieces; (C) bark which showed no gum; (D) large pieces of wood with no visible gum. These were sampled by sawing and collecting the dust.

Each of these portions was extracted with boiling anylic alcohol, which dissolves kauri-gum, and the extract saponified and further extracted with sulphuric ether both before and after acidifying. The sum of the ether extracts, and a resinous substance which appeared on acidifying, and which was insoluble in ether, was considered to represent the kauri-gum present. Although a blank experiment with kauri-gum (pure) showed that practically all the gum could be extracted by this means, probably an appreciable proportion of other substances would be also extracted from the timber.

The results were—A, 31.1 per cent.; B, 41.8 per cent.; C, 16.5 per cent.; D, 16.8 per cent. The average over the whole of the sample as received would be about 19.4 per cent.

These results show that the dust and bark (portions A and C), which are easily separated, and need very little pulverizing, contain 15 to 40 per cent. of kauri-gum. If separated and stored they could probably be treated by an extraction process.

The cutting-out of the gummy portions of the wood (B) from the rest of the timber would be a tedious process, and might not pay for the labour involved. The timber would probably have to be treated without any such separation. It would be difficult to reduce to a sufficiently fine state of division for extraction to be feasible. Distillation at low pressures might yield some commercial products of value.

These results, although probably too high, are sufficiently accurate to show that the timber forwarded contains a large amount of kauri-gum. In order to determine whether this sample is fairly representative it would be advisable to send me further samples from other parts of the field.

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Further samples of the timber, which it is fully anticipated will give equally satisfactory results, are being forwarded to Dr. Maclaurin.