

1909.
NEW ZEALAND.

DEPARTMENT OF LANDS:
STATE NURSERIES AND PLANTATIONS
(REPORT ON).

Presented to both Houses of the General Assembly by Command of His Excellency.

SIR,—

Department of Lands, Wellington, 18th May, 1909.

I have the honour to submit herewith the report of the officer in charge of the State nurseries and plantations for the financial year ended 31st March last, prefacing it with an outline of the good work carried out under the direction of the late Chief Forester, Mr. H. J. Matthews, from 1896 up to the time of his death (27th April, 1909), and also indicating in a general manner the lines on which the Afforestation Branch of this Department is now proceeding.

The illustrations accompanying the report are for the purpose of showing the extremely slow growth of the principal native timber-trees as compared with some of the exotic trees grown at the State nurseries.

I have, &c.,

WILLIAM C. KENSINGTON,
Under-Secretary for Lands.

The Right Hon. Sir Joseph G. Ward, P.C., K.C.M.G.,
Minister of Lands and Commissioner of State Forests.

THE following report, giving the reafforestation operations for the past year, is clothed with a melancholy interest, as shortly after the close of the financial year Mr. H. J. Matthews, the late Chief Forester, was stricken with a severe illness, to which he succumbed about the end of April. The late Mr. Matthews was carrying on his official duties to the very last. Early in April he arranged with myself to meet him at Rotorua during Easter, so that together we might discuss several important matters on the ground, relative to the planting operations with prison labour. On my arrival at Rotorua I received a letter from him saying he felt so unwell that he was obliged to leave for Auckland to obtain medical advice, and about a month later the news of his death came to hand. To the late Mr. Matthews belongs the whole credit of the direction of the reafforestation operations. Selected for the work by the late Sir John McKenzie in 1896, Mr. Matthews relinquished his own successful nursery business at Dunedin, and took over the charge of the reafforestation operations, throwing all his energy into the work, and bringing to bear upon it all his technical experience. The first State nursery started was at Eweburn, in Otago, followed by one at Tapanui, also in Otago. Then followed the Rotorua Nursery, after which came the Seddon Nursery, in the Marlborough district; Hanmer, in North Canterbury; and Ruatangata, near Whangarei, in the Auckland district. From these nurseries the trees required for the grand plantations at Dusky Hill and Conical Hills, in Otago; Hanmer, in North Canterbury; Waiotapu and Waipa, in the Thermal Springs district; and Puhupuhi, near Whangarei, were obtained. The late Chief Forester was a whole-hearted supporter of the system of employing prison labour, and personally supervised the erection of each prison camp, going minutely into every detail to insure success. I have been most closely associated with him since 1902, and have always found him very enthusiastic and painstaking, sparing no personal trouble in carrying out all details. Some two years ago, at the request of the Commissioner of State Forests, he wrote a well-arranged book upon tree-planting in New Zealand, which was published by the Government Printer, and which work came in for universal praise. Last, but not least, of the fruits of Mr. Matthews's labours has been the training of experienced nurserymen and assistants, who are now able to carry on the work, without a break, so ably directed by the late Chief Forester. The sympathy

of the Department is extended to Mrs. Matthews, who was his constant companion, and herself supplied most beautifully developed photographs to illustrate not only her husband's annual reports, but also scenic reports for the Scenery Preservation Commission, of which the late Mr. Matthews was a most valued member.

The operations of the past year have been carefully compiled by Mr. Goudie, the Nurseryman-in-Charge at Rotorua, and are given with the usual detail. I have been able to acquaint myself personally with all the plantations, and to gain a complete insight into the working. I can say that whilst every economy possible is being practised, there is no diminution of the output of trees from the nurseries. Thanks to the care of the Justice Department, a full supply of prison labour is being kept up, and through this means the number of trees to be planted out during the ensuing season should be quite equal to last year's. As I have previously pointed out, the splendid income with which the reafforestation operations have been hitherto carried out has been almost entirely derived from the sale of kauri on the reserves proclaimed under the State Forests Act in the northern district. This source of income is now rapidly drawing to a close, and the necessary moneys for carrying on reafforestation must in future be chiefly granted from, and be a charge upon, the Consolidated Fund. It is therefore all the more necessary that the planting-work, where possible, shall now be carried on entirely by prison labour, in which course we are assured of the cordial co-operation of the Prisons Branch of the Justice Department.

FREE DISTRIBUTION OF TREES TO SETTLERS.

The question as to whether the Government should further encourage tree-planting, by distributing suitable trees to persons willing to devote land and time to this purpose, has been very generally discussed both by the Press itself and by letters written to the newspapers. No doubt the free distribution of trees would tend to materially increase the area of plantations, but it must be borne in mind that to carry this out in any general manner would necessitate doubling the number of employees in the nurseries, and also the number of trees grown, because with the present staff only sufficient trees are grown to meet the requirements of the labour available. Also, above all, the present income, including the expected grant from the Consolidated Fund, is only barely sufficient to meet the demands at the Department's present output of trees for the annual plantings.

PRISON CAMPS.

There are three prison camps in existence—one at Hanmer; one at Waiotapu, between Rotorua and Taupo; and one just newly erected on a most suitable site on the northern shore of Lake Rotokakahi, near Rotorua, which takes the place of the old prison camp at Waipa. I personally inspected the site of this new camp at Easter, and arranged with Mr. Goudie, the Nurseryman-in-Charge, and with Mr. J. T. Reid, the Chief Warder, the details of the buildings, water-supply, &c. Using this camp as a centre, there is fully five years' planting to be done, whilst at Waiotapu the planting can be continued for ten years.

GENERAL.

In last year's report the general question of forestry was dealt with, and, as it is intended by the Right Hon. the Minister of Lands to lay before Parliament during the session an exhaustive paper on New Zealand forests generally, the subject will not be further treated upon in this report.

REPORT BY THE OFFICER IN CHARGE.

To the Under-Secretary for Lands.

I HAVE the honour to submit herewith the thirteenth annual report of the Afforestation Branch. The past year has been a most successful one at all the stations, owing chiefly to the excellent weather conditions experienced throughout the Dominion.

Prison Labour.—The total value of work done by prisoners at the three prison camp plantations—viz., Hanmer Springs, Whakarewarewa, and Waiotapu—is £4,894 16s 5d., making an average for each of the 58'99 men employed of £82 19s. 6d. These results go to prove that the employment of prisoners at this class of work has been very successful, and might be advantageously extended. The majority of the men like the work, and take an interest in it, thus making for success.

At the Waipa Prison, Whakarewarewa Plantation, all the land within a radius of a mile and a quarter has been planted, and it has been necessary to select a site to which the camp can be shifted. A suitable place has been chosen at Lake Rotokakahi, and the new camp will probably be ready for occupation about the end of May. The land within easy distance of this site will provide employment for four or five years. The Inspector of Prisons and his staff deserve our best thanks for their co-operation and assistance generally in carrying on the works at the camps.

Starborough Nursery.—Owing to the repeated failures amongst trees planted in this district it was decided to close down the nursery, and also the Dumgree Plantation. During the past year the trees which remained in the nursery were transferred to the Tapanui district, whilst the tools, implements, &c., were distributed amongst the various stations as required. Most of the land was sown down in oats, which resulted in a yield of 1,250 bags of chaff and 200 bags of feed oats, and this was transferred to the North Island stations.

The expenditure at these two stations, which is shown in the summary, was incurred in the above-mentioned works.

Kurou Nursery.—The remainder of the trees and implements at this station were transferred during the year to the Tapanui district.

In the following tables the work of this branch is summarised:—

TABLE A.—SUMMARY OF RESULTS.

Nursery or Plantation.	Number of Trees raised, 1908-9.	Total number of Trees raised, 1896 to 1909.	Values of Same.	Number of Trees in Nurseries or Plantations at 31st March, 1909.	Number of Trees planted on New Area, 1908-9.	Area planted in 1908-9.	Total Area planted at 31st March, 1909.
			£ s. d.			A. R. P.	A. R. P.
Eweburn Nursery ..	667,600	4,148,717	8,675 3 8	1,584,340	..	..	..
Hanmer Springs Nursery ..	2,899,200	7,340,531	11,315 2 7	4,554,650	..	..	..
Kurow Nursery ..	..	219,000	223 3 0	..	..	..	..
Tapanui Nursery ..	2,527,000	15,664,733	34,567 0 10	5,360,250	..	..	..
Starborough Nursery ..	..	3,223,290	6,918 8 11	..	..	..	..
Rotorua Nursery ..	4,395,500	30,662,309	57,873 0 9	8,369,500	..	..	..
Ruatangata Nursery ..	680,000	2,317,868	5,013 13 9	832,500	..	..	..
Dusky Hill Plantation ..	..	..	*	1,973,392	697,225	300 1 32	806 0 0
Conical Hills Plantation ..	..	..	*	3,777,120	463,541	170 1 07	1,252 2 7
Gimmerburn Plantation ..	..	..	*	487,695	..	..	173 1 0
Naseby Plantation ..	..	..	*	389,285	29,100	10 2 0	143 0 0
Hanmer Springs Plantation ..	..	..	*	2,431,230	568,060	208 0 0	876 0 0
Kaingaroa Plains Plantation ..	..	..	*	44,275	..	..	21 0 0
Dumgree Plantation ..	..	..	*	350,000	..	..	469 3 0
Raincliff Plantation ..	..	..	*	50,000	..	..	206 3 0
Ruatangata Plantation ..	..	..	*	..	..	..	22 0 0
Waiotapu Plantation ..	..	..	*	9,095,359	2,162,425	794 2 0	3,523 0 0
Whakarewarewa Plantation ..	..	..	*	6,883,226	1,841,100	838 2 0	3,157 2 0
Puhipuhi Plantation ..	..	..	*	1,488,236	470,028	387 0 0	1,512 0 0
Waitahuna Plantation ..	..	..	*	30,525	..	..	12 1 14
Domains, reserves, &c. ..	..	..	..	133,632	..	..	..
Totals ..	11,169,300	63,576,448	124,585 13 6	47,835,217	6,231,479	2,709 9 39	12,175 0 21

* Reliable estimates of values not available.

TABLE B.—SUMMARY OF EXPENDITURE AND VALUES.

Name of Station.	Expenditure for Year ending 31st March, 1909.	Expenditure from September, 1896, to 31st March, 1909.	Value of Stock and Improvements for Year ending 31st March, 1909.	Value of Stock, Improvements, &c., from September, 1896, to 31st March, 1909.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Eweburn Nursery ..	773 13 11	10,311 15 6	2,805 13 6	7,589 1 1
Hanmer Springs Nursery ..	1,590 13 3	5,514 1 8	7,678 6 2	9,690 11 5
Tapanui Nursery ..	2,024 7 10	17,270 4 11	8,961 4 5	16,285 0 5
Ruatangata Nursery ..	1,431 0 8	7,444 7 3	2,134 18 7	5,292 4 11
Rotorua Nursery ..	5,091 5 10	30,618 4 10	13,434 14 2	20,902 7 7
Starborough Nursery ..	567 5 11	9,256 7 1	*	*
Kurow Nursery ..	..	3,070 2 7	*	*
Conical Hills Plantation ..	2,190 14 1	11,877 12 0	*	*
Dusky Hill Plantation ..	1,185 5 9	11,499 15 2	*	*
Gimmerburn Plantation ..	366 11 11	2,366 6 2	*	*
Naseby Plantation ..	193 2 2	2,266 12 7	*	*
Raincliff Plantation ..	..	1,104 12 5	*	*
Hanmer Springs Plantation ..	1,309 17 5	5,684 1 6	*	*
Dumgree Plantation ..	155 2 6	10,017 10 5	*	*
Whakarewarewa Plantation ..	4,608 7 1	18,150 0 6	*	*
Waiotapu Plantation ..	2,154 1 9	7,363 19 0	*	*
Kaingaroa Plains Plantation ..	..	368 18 2	*	*
Puhipuhi Plantation ..	1,697 18 4	6,486 11 8	*	*
Waitaki Plantation ..	..	403 14 5	*	*
Waitahuna Plantation ..	14 10 6	183 0 9	*	*
Domains, Reserves, &c. ..	..	431 13 1	..	..
Clerical assistance ..	65 12 8	739 7 8	..	..
Postages and telegrams ..	..	60 5 4	..	..
Contingencies: Telephones, stationery, &c., travelling allowances and expenses	621 15 2	1,653 8 7	..	..
Totals ..	26,041 6 9	164,142 13 3	35,014 16 10	59,759 5 5

* Reliable estimates of values not available.

TABLE C.—OUTPUT OF TREES FROM NURSERIES.

Nursery.	During 1908-9.		Since 1896.	
	Number.	Value.	Number.	Value.
		£ s. d.		£ s. d.
Eweburn	157,050	428 12 7	2,564,377	6,047 18 10
Tapanui	700,035	2,066 7 6	10,368,083	26,268 1 4
Hanmer Springs	736,340	1,609 6 11	2,307,546	5,588 17 6
Rotorua	4,491,510	9,541 1 3	22,292,809	46,460 5 9
Ruatangata	536,450	1,456 12 6	1,488,245	4,019 10 10
Kurow	62,200	66 3 6	172,460	278 18 6
Starborough	575,920	1,636 6 0	3,059,610	6,934 1 11
Totals	7,259,505	16,804 10 3	42,253,130	95,597 14 8

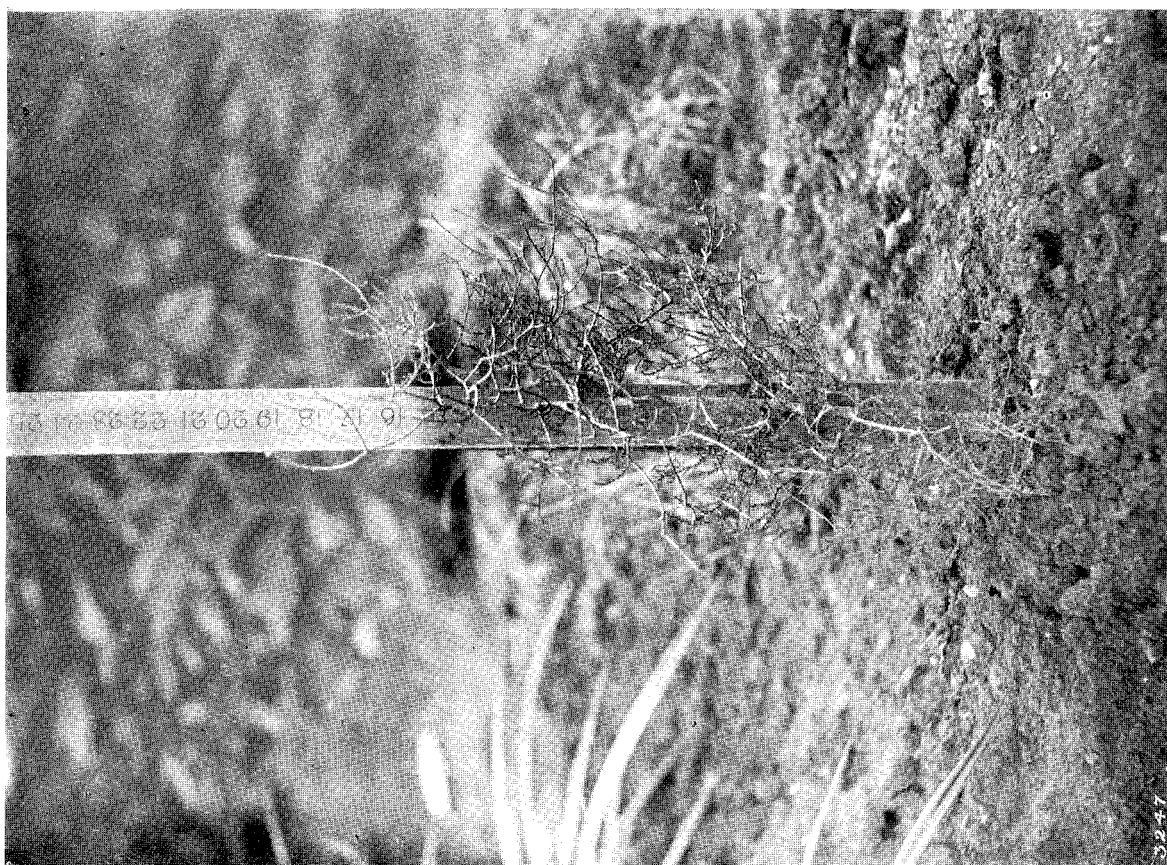
TABLE D.—MINIMUM AND MAXIMUM READINGS OF THERMOMETER (FAHRENHEIT) AND RAINFALL AT VARIOUS STATIONS FOR THE YEAR.

Station.	Temperature.		Rainfall.	
	Minimum.	Maximum.	Inches.	Number of Days.
	Deg.	Deg.		
Eweburn Nursery	2	84	21·78	111
Tapanui Nursery	24	88	39·92	157
Hanmer Springs Nursery... ..	17	83	44·77	151
Rotorua Nursery	23	87	52·10	165
Ruatangata Nursery	28	82	59·33	181
Waiotapu Plantation	17	86	42·06	93
Puhipuhi Plantation	24	87	71·45	169

TABLE E.—AVERAGE NUMBER OF WORKMEN EMPLOYED DAILY AT THE VARIOUS NURSERIES AND PLANTATIONS DURING THE YEAR 1908-9.

Station.	Free Labour.	Prison Labour.	Station.	Free Labour.	Prison Labour.
	No.	No.		No.	No.
Eweburn Nursery	5·00	...	Conical Hills Plantation ...	15·52	...
Tapanui Nursery	12·11	...	Hanmer Springs Plantation	3·00	13·00
Hanmer Springs Nursery ...	9·00	...	Dungree Plantation*	...	...
Starborough Nursery*	...	...	Whakarewarewa Plantation	32·72	13·16
Rotorua Nursery	31·62	...	Waiotapu Plantation	8·46	32·83
Ruatangata Nursery	9·78	...	Puhipuhi Plantation	9·92	...
Gimmerburn Plantation ...	1·56	...	Waitahuna Plantation	00·5	...
Naseby Plantation	1·20	...			
Dusky Hill Plantation	9·91	...		149·85	58·99

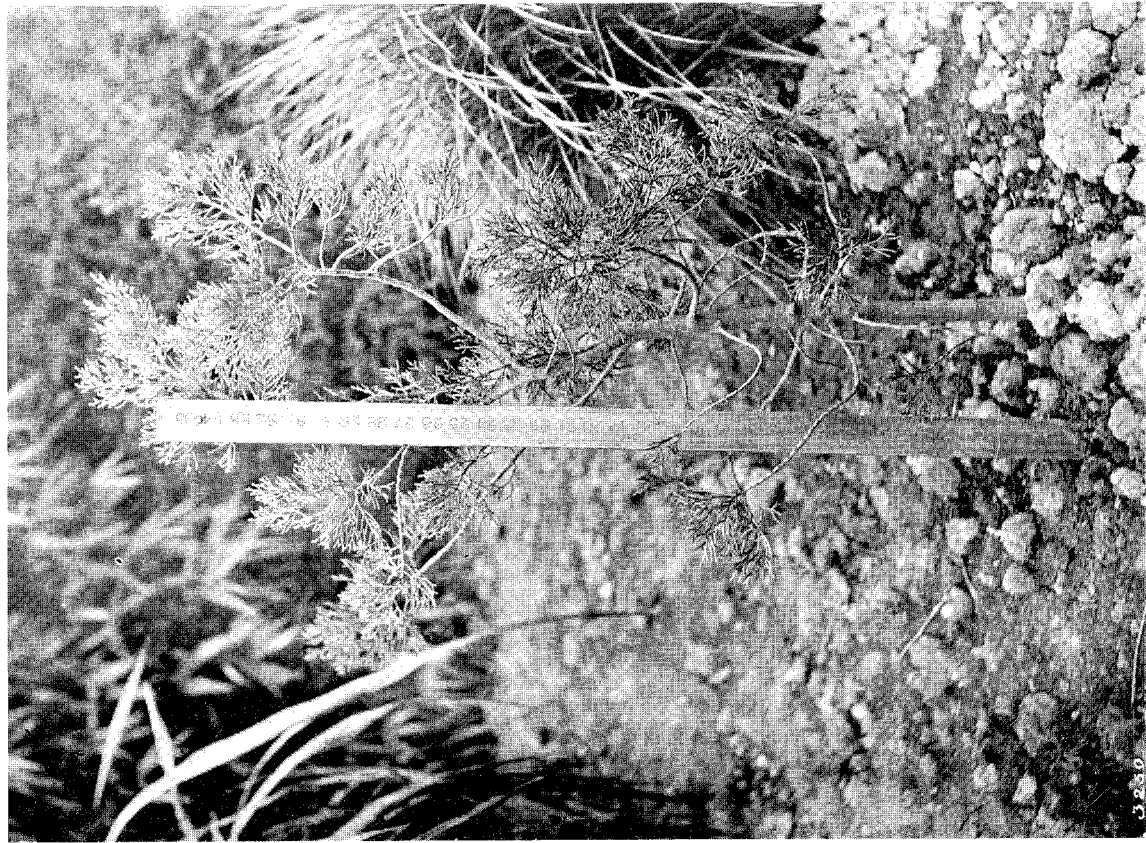
* Particulars not available.



Podocarpus spicatus (BLACK-PINE)—7 YEARS OLD, 19 IN. HIGH.



Acer pseudo-platanus (SYCAMORE)—7 YEARS OLD, 13 FT. HIGH.



Dacrydium intermedium (YELLOW SILVER-PINE)—7 YEARS OLD, 42 IN. HIGH.



Fraxinus excelsior (ENGLISH ASH)—7 YEARS OLD, 12 FT. HIGH.

The following are the reports from various stations :—

EWEBURN NURSERY, NEAR NASEBY, OTAGO.

(Area, 49 acres; altitude, 1,400 ft.)

The rainfall during the year has been much heavier than last, the total being 21·78 in., which fell on 111 days, the maximum fall being 3·60 in. in January. This is 8·40 in. in excess of last year.

The highest reading of the thermometer was 84°, on the 8th March, and the lowest 2° (30° of frost), on the night of the 30th July. Frost occurred on 133 nights.

The general growth of nursery stock has been very satisfactory, owing to the heavy rainfall. Seeds were sown as usual in October, also a second sowing in December, and both have germinated very well.

Of the trees lined out, *Pinus ponderosa*, *Pinus Bethamiana*, *Pinus Austriaca*, and *Larix Europæa* have made the most satisfactory growth. *Pinus Laricio*, being somewhat slower, will require to be left for another season before being transferred to the plantation for planting out permanently.

The number of trees lined out was 470,960, at an average cost of 2s. 10d. per thousand; also 90,000 were lined in at an average cost of 1s. 0½d. per thousand.

The number of trees sent to Government plantations was 157,050, their total value being £428 12s. 7d.

The number of trees sent out to date amounts to 2,564,377, their total value being £6,047 18s. 10d.

The number of trees in the nursery at the 31st March, 1909, was 1,584,340, and their value £2,627 4s. 10d. Details will be found on Schedules 1 to 4.

The average number of men employed was five (wages).

Appended are the meteorological records for the year :—

Meteorological Returns.

Month.	Rainfall.	Number of Days Rain fell.	Maximum Temperature.	Date.	Minimum Temperature.	Date.	Number of Days on which Frost occurred.
1908.	Inches.		Degrees.		Degrees.		
April ...	1·60	10	71	1st	24	30th	12
May ...	1·18	11	64	3rd	21	27th	21
June ...	1·60	16	58	12th	21	21st	22
July ...	3·50	11	44	20th	2	30th	29
August ...	1·30	4	50	29th	7	12th	30
September ...	0·76	5	65	28th	26	24th	5
October ...	1·21	11	81	8th	29	14th	5
November ...	0·63	6	81	27th	29	10th	4
December ...	2·60	10	75	29th	27	9th	3
1909.							
January ...	3·60	14	81	22nd	33	1st	...
February ...	1·03	3	80	27th	28	21st	1
March ...	2·77	10	84	8th	30	14th	1
Totals ...	21·78	111	...	...	...	...	133

Statement of Expenditure.

	£	s.	d.
Amount at 31st March, 1908	9,538	1	7
Tree-growing	325	6	6
General maintenance and repairs	174	7	2
Horse-feed, purchased and grown	40	11	6
Tree-seeds	54	12	0
Tools, implements, &c.	2	12	0
Fuel	9	17	6
Travelling-expenses	9	3	6
Miscellaneous works	6	17	1
Proportion of Nurseryman's salary	126	0	0
Supervision	24	6	8
	£10,311	15	6

Value of Stock, Improvements, &c

	£	s.	d.	£	s.	d.	£	s.	d.
Amount at 31st March, 1908	...	...	...	6,540	2	11			
Less value of trees at 31st March, 1908	1,747	5	4						
Less horse-feed in stock at 31st March, 1908	9	10	0	1,756	15	4			
							4,783	7	7
Trees, as per Schedule 1	...	...	...	...	...	...	704	18	0
" " 2	...	...	...	...	...	...	790	13	0
" " 3	...	...	...	...	...	...	1,131	13	10
Tools and implements	...	...	...	...	...	...	2	12	0
Improved value	...	...	...	...	...	...	150	6	8
Horse-feed in stock	...	...	...	...	...	...	15	10	0
Value of young horses—increased value during year	...	...	...	...	...	...	10	0	0
							£7,589	1	1

Summary.

Value of present stock and general improvements	...	...	7,589	1	1
Value of trees sent out since initiation of nursery	...	...	6,047	18	10
			13,636	19	11
Expenditure to date	...	...	10,311	15	6
			£3,325	4	5
Credit balance	...	...	

Stock in Hand.

SCHEDULE 1.—Details of One-year-old Trees, grown 1908-9. (Thirteenth Crop.)

Name of Tree.	Number in Seed-beds.	Height in Inches.	Amount of Seed sown.	Value per Thousand.	Total Value.	Remarks.
Pinus Laricio	340,200	2	Lb. 112	£ s. d. 1 0 0	£ s. d. 340 4 0	Strong plants.
" Benthamiana	43,200	1½	10	1 5 0	54 0 0	"
" ponderosa	106,000	1½	28	1 5 0	132 10 0	"
Larix Europæa	178,200	1	112	1 0 0	178 4 0	"
Totals	667,600	..	262	..	704 18 0	

SCHEDULE 2.—Two-year-old Trees, grown 1907-8. (Twelfth Crop.)

Name of Tree.	Number in Seed-beds.	Height in Inches.	Value per Thousand.	Total Value.	Remarks.
Pinus Laricio	250,000	3	£ s. d. 1 5 0	£ s. d. 312 10 0	Strong plants.
" Benthamiana	30,000	4-6	1 10 0	45 0 0	"
" " (true)	22,100	4-6	1 10 0	33 3 0	"
" ponderosa	40,000	4-6	1 10 0	60 0 0	"
Larix Europæa	110,000	6-12	1 5 0	137 10 0	"
" (lined in)	90,000	6-12	2 5 0	202 10 0	"
Totals	542,100	..	..	790 13 0	

SCHEDULE 3.—Three-year-old Trees, grown 1906-7. (Eleventh Crop.)

Name of Tree.	Number in Nursery Rows.	Height in Inches.	Value per Thousand.	Total Value.	Remarks.
Pinus Austriaca	41,540	4-6	£ s. d. 3 0 0	£ s. d. 124 12 4	Good plants.
" Laricio	200,000	4-6	3 0 0	600 0 0	Medium growth.
" ponderosa	47,400	4-6	3 0 0	142 4 0	Very strong.
" Jeffreyi	1,300	4-6	3 5 0	4 4 6	"
" Bethamiana	16,000	4-6	3 5 0	52 0 0	"
Larix Europæa	9,100	8-12	3 0 0	27 6 0	"
" "	55,400	8-12	3 0 0	166 4 0	"
Pyrus aucuparia	3,450	8-12	4 0 0	13 16 0	"
Betula alba	450	8-12	3 0 0	1 7 0	"
Totals	374,640	..	..	1,131 13 10	

SCHEDULE 4.—Trees sent out from Nursery to Plantations, &c., 1908–9.

Where sent.	Name of Tree.	Number.	Value per Thousand.	Total Value.
Gimmerburn Plantation	<i>Pinus Austriaca</i>	36,885	£ s. d. 3 0 0	£ s. d. 110 12 1
	" <i>Laricio</i>	4,750	3 0 0	14 5 0
	" <i>ponderosa</i>	10,000	3 0 0	30 0 0
	<i>Larix Europæa</i>	1,750	1 5 0	2 3 9
	" "	12,400	4 0 0	49 12 0
Hon. R. McNab	<i>Pinus montana</i>	33,675	3 0 0	101 0 6
		2,000	..	..
	Total	101,460		307 14 4
Survey paddock	<i>Pinus ponderosa</i>	14,275	3 0 0	42 16 6
	" "	11,875	1 5 0	14 16 10
	" <i>Bethamiana</i>	4,050	1 5 0	5 1 3
	<i>Larix Europæa</i>	1,000	1 5 0	1 5 0
	<i>Cytisus vulgare</i>	21,650	2 5 0	48 14 3
	Total	52,850		112 13 10
Gimmerburn	<i>Pinus Austriaca</i>	215	3 0 0	0 12 11
Cemetery Trust	" <i>ponderosa</i>	275	3 0 0	0 16 6
	Total	490		1 9 5
Various domains	<i>Pyrus aucuparia</i>	1,000	3 0 0	3 0 0
	<i>Cytisus vulgare</i>	1,000	3 0 0	3 0 0
	Total	2,000		6 0 0
Tourist Department, Queenstown..	<i>Pyrus aucuparia</i>	50	3 0 0	0 3 0
Tapanui Nursery	" "	200	3 0 0	0 12 0
Totals .. ..	.. ..	157,050	..	428 12 7

A. W. ROBERTS,
Nurseryman in Charge.

HANMER SPRINGS NURSERY.

(Area, 40 acres; approximate altitude, 1,225 ft.)

Rain fell on 151 days during the past year, the total fall recorded being 44·77 in. The maximum monthly fall was recorded in January, when 7·63 in. fell in 15 days. The maximum temperature registered during the year was 83° Fahr., on 19th February, and the minimum 17° Fahr., on 12th July.

The general weather-conditions experienced throughout the past year were, on the whole, fairly favourable for tree-growth, although the lined-out trees were somewhat retarded in growth during November by the exceptionally dry weather experienced during that month.

The three-year-old trees of all classes have made exceptionally good growth during the year, and these are all suitable for transferring to the plantation during the coming planting season.

Two-year-old lined-out larch are an exceptionally fine crop, of an average height of 12 in., and the whole of this crop can be transferred to the plantation this season.

The various species of two-year-old pines have made fair growth; but a large proportion of *Pinus Laricio* will be rather small for transferring to the plantation during the coming season. Amongst the pines lined out during the year the average number of deaths is about 5 per cent., and there are practically no failures amongst larch.

Seed-sowing was commenced on the 7th November, and completed on the 12th of the same month, the weather being favourable while this work was in progress.

The crop of seedling larch is a particularly fine one, the average height of these plants being 3 in., and the approximate number in the seed-beds is 1,600,000. *Pinus Laricio* seedlings are a particularly sturdy crop, and the other varieties of pine seedlings are also very good.

Transplanting seedlings was commenced on the 17th August, and completed on the 19th October, the number of trees dealt with being 1,306,261, at a labour-cost of 1s. 10d. per thousand.

The number of trees raised from seed during the year was 2,899,200, valued at £2,939 3s.; and the number of trees raised in the nursery to date since its inception is 7,340,531, valued at £11,315 2s. 7d.

The total number of trees in the nursery at 31st March was 4,554,650, valued at £7,033 18s.

Trees transferred to the plantation during the year numbered 736,340, valued at £1,699 6s. 11d., and the total number of trees transferred to the plantation to date is 2,307,546, valued at £5,588 18s. 6d. The estimated number of trees available for transferring to the plantation during the present season is 1,200,000.

During the year good progress has been made with the general improvement of the nursery; the formation of extension area has been completed, and all roads throughout the nursery have been gravelled where absolutely necessary. The appearance of the nursery has been much improved during the year by the planting of shelter and ornamental shrubs on spare areas of land, also by sowing grass amongst shrubs.

The water-supply obtained from Hanmer Township supply continues satisfactory, and an abundant supply of good water is always available for all nursery purposes.

The erection of new five-stall stable, commenced last year, was completed during April, and the old stable converted into an open shed for the storage of implements; a lean-to was also erected, adjoining stable, for the purpose of storing harness, &c. The implement-shed is now too small for the storage of all implements and vehicles, and it is necessary to leave two drays and a wagon outside; this will necessarily cause depreciation in their value.

Further accommodation is urgently required at the Nurseryman's quarters, as the present cottage consists of three small rooms, which are quite inadequate for requirements.

For the purpose of providing additional paddock-accommodation for the horses, 10 acres of grasses and clover were sown during September, with very favourable results. The horse-paddocks now comprise 25 acres of good pasture.

The average number of hands employed daily during the year was six men and three boys.

Thirty-five tons of oat-sheaf of excellent quality and 5 tons of swedes and horse-carrots were grown during the year for horse-feed.

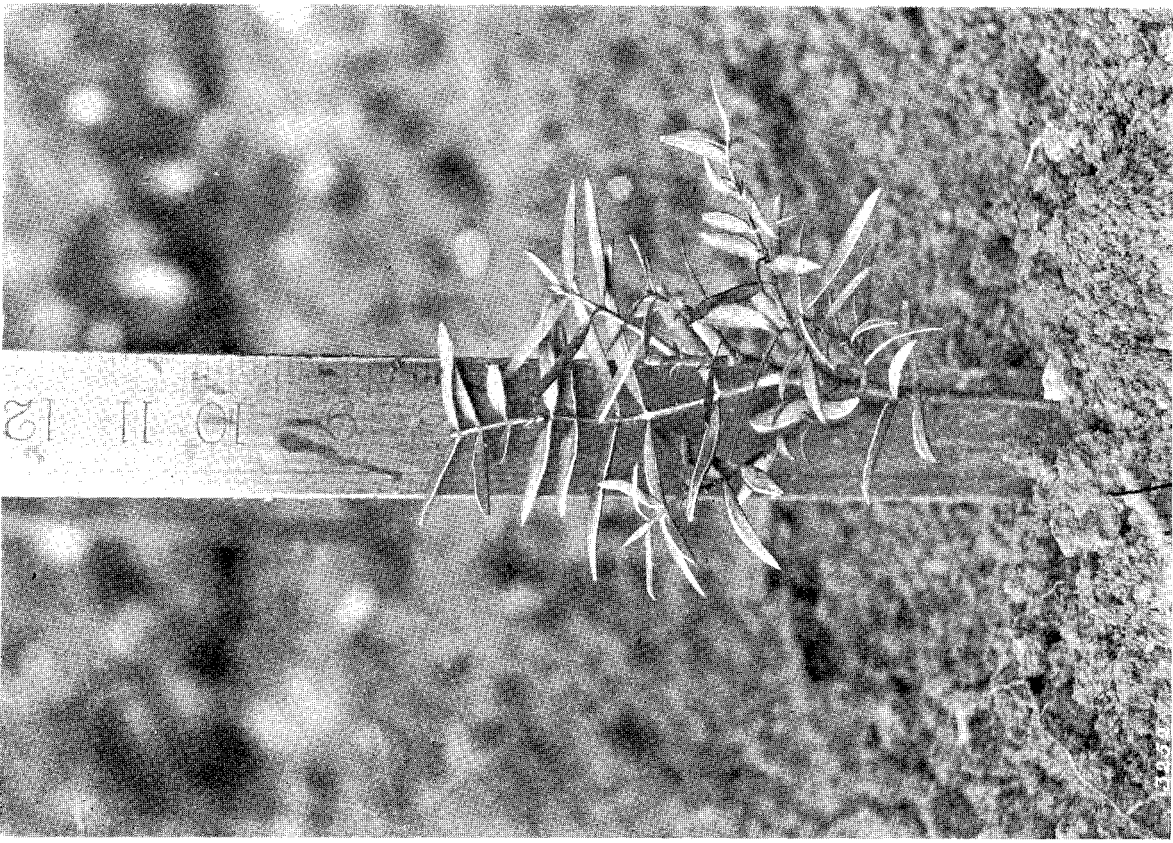
Schedules are appended of trees in stock and sent out during the year, also details of expenditure and values for the year and to date.

The following is a record of the rainfall and temperature for the year :—

Month.	Rainfall.	Number of Days Rain fell.	Maximum Tempera- ture.	Date.	Minimum Tempera- ture.	Date.
1908.	Inches.		Degrees.		Degrees.	
April	4·10	14	72	2nd	29	20th
May	4·45	11	70	3rd	26	30th
June	3·37	13	63	5th	27	3rd
July	6·79	17	57	23rd	17	12th
August	2·28	10	58	30th	21	10th
September	3·25	12	69	29th	29	20th
October	5·05	18	81	12th	30	29th
November	0·86	9	79	20th	34	13th
December	2·11	17	70	8th	33	10th
1909.						
January	7·63	15	82	23rd	35	2nd
February	0·68	5	83	19th	42	25th
March	4·20	10	80	7th	32	30th
Totals	44·77	151	...	...	...	...

Statement of Expenditure.

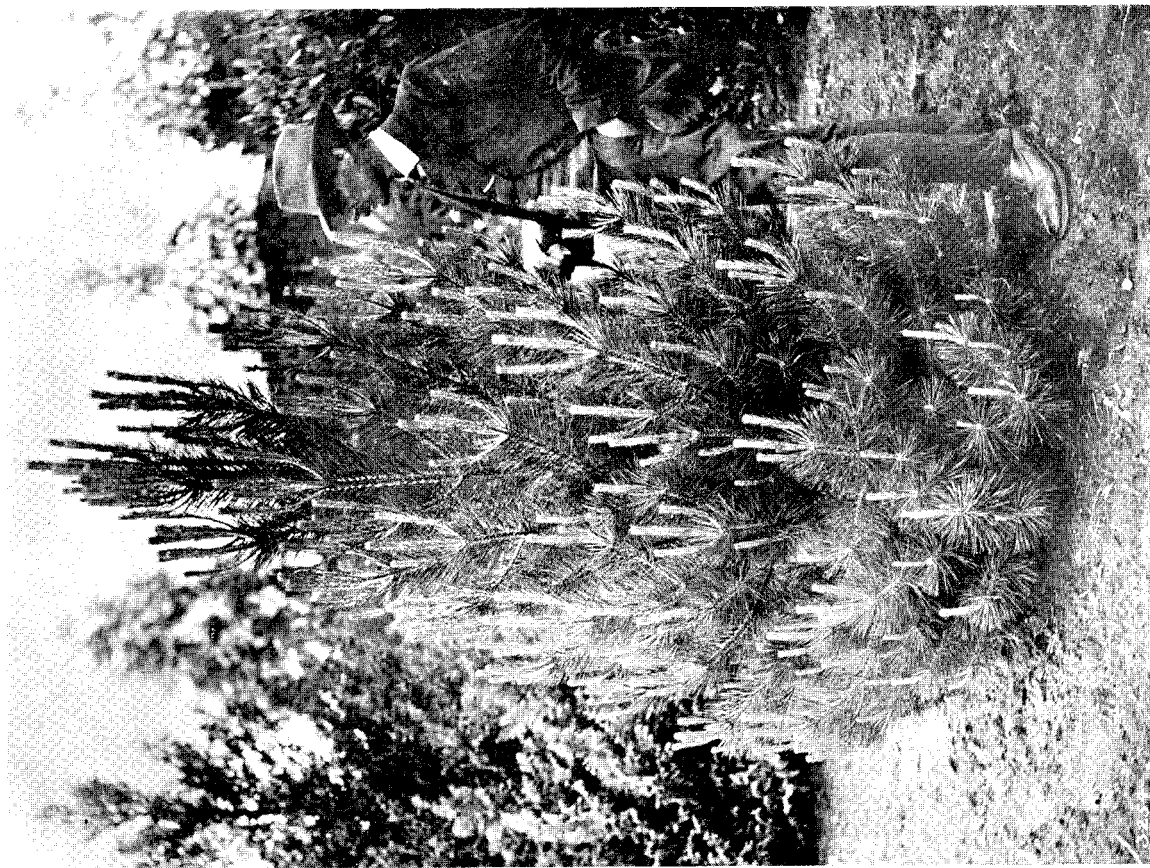
	£	s.	d.
Amount at the 31st March, 1908	3,923	8	5
Tree-growing	727	4	2
General maintenance and repairs	139	13	2
Nursery-formation	17	6	5
Horse-feed purchased and grown	118	16	8
Manures	15	9	6
Tree-seeds	96	15	0
Tools, implements, &c.	85	4	9
Water-supply	106	19	4
Buildings	110	1	1
Fencing	38	6	7
Miscellaneous works	8	6	7
Proportion of Nurseryman's salary	90	0	0
Supervision	36	10	0
	£5,514	1	8



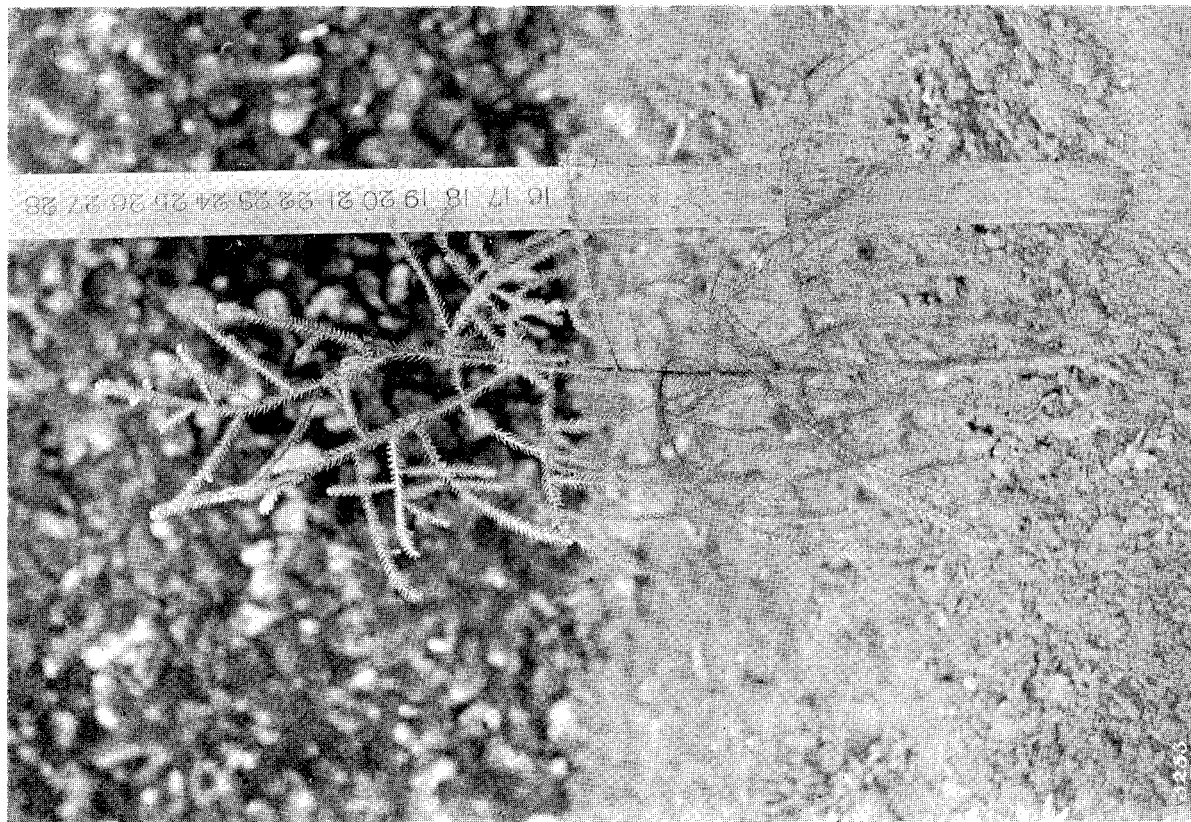
Agathis Australis (KAURI)—7 YEARS OLD, 8 IN. HIGH.



Larix Europea (EUROPEAN LARCH)—7 YEARS OLD, 20 FT. HIGH.



Pinus Austriaca (AUSTRIAN PINE)—7 YEARS OLD, 9 FT. HIGH.



Dacrydium cupressinum (RIMU, RED-PINE)—7 YEARS OLD, 27 IN. HIGH.

Value of Stock, Improvements, &c.

	£	s.	d.	£	s.	d.	£	s.	d.
Amount at 31st March, 1908	6,917	13	9			
Less value of trees at 31st March, 1908	4,865	8	6			
Less horse-feed in stock at 31st March, 1908	40	0	0			
				4,905	8	6			
Trees, as per Schedule 1				2,012	5	3
" " 2				2,939	3	0
" " 3				2,627	15	0
Tools and implements				85	4	9
Water-supply				106	19	4
Nursery-formation				17	6	5
Fencing...				38	6	7
Buildings				110	1	1
Improved value				126	10	0
Horse-feed in stock				160	0	0
							£9,690	11	5

Summary.

	£	s.	d.
Value of present stock and general improvements	9,690 11 5
Value of trees sent out since initiation of nursery	5,588 17 6
			15,279 8 11
Expenditure to date	5,514 1 8
Credit balance	£9,765 7 3

Stock in Hand.

SCHEDULE 1.—Details of One-year-old Trees, grown 1908–9. (Seventh Crop.)

Name of Tree.	Number in Seed-beds.	Height in Inches.	Seed sown.	Value per Thousand.	Total Value.	Remarks.
			Lb.	£ s. d.	£ s. d.	
Larix Europæa	1,600,000	1–4	252	1 0 0	1,600 0 0	Excellent crop.
Pinus Laricio	884,000	2½	112	1 0 0	884 0 0	"
" ponderosa	280,000	2½	30	1 0 0	280 0 0	"
" Benthamiana	92,000	2½	12	1 5 0	115 0 0	"
" muricata	7,000	3	1	1 0 0	7 0 0	"
Alnus glutinosa	700	6	10	0 15 0	0 10 6	Very thin crop.
Chamaecyparis Lawsoniana	16,000	1½	2	1 10 0	24 0 0	Good crop.
Thuja gigantea	17,000	1½	1	1 10 0	25 10 0	"
Pseudo-tsuga taxifolia	1,500	2	8	1 5 0	1 17 6	Thin crop.
Picea sitchensis	1,000	1	5	1 5 0	1 5 0	"
Totals	2,899,200	..	..	..	2,939 3 0	

SCHEDULE 2.—Details of Two-year-old Trees, grown 1907–8. (Sixth Crop.)

Name of Tree.	Number in Nursery Lines.	Height in Inches.	Value per Thousand.	Total Value.	Remarks.
			£ s. d.	£ s. d.	
Larix Europæa	674,000	10–16	2 5 0	1,516 10 0	Excellent crop.
Pinus Laricio	366,000	2–4	2 5 0	823 10 0	Fair crop.
" ponderosa	55,000	4	2 5 0	123 15 0	Good crop.
" Benthamiana	19,000	4	2 10 0	47 10 0	"
" (var.)	13,000	4	2 10 0	32 10 0	"
Pseudo-tsuga taxifolia	17,000	6	2 10 0	42 10 0	Fair crop.
Betula alba	10,000	24	2 5 0	22 10 0	Excellent crop.
Robinia pseudo-acacia	11,000	4–12	1 10 0	16 10 0	Fair crop.
Alnus glutinosa	650	14	2 0 0	1 6 0	Good crop.
Cotoneaster Simmondsii	800	15	1 10 0	1 4 0	"
Totals	1,166,450	..	..	2,627 15 0	

SCHEDULE 3.—Three-year-old Trees, grown 1906-7. (Fifth Crop.)

Name of Tree.	Number in Nursery Lines.	Height in Inches.	Value per Thousand.	Total Value.	Remarks.
<i>Larix Europæa</i>	117,000	18	£ s. d. 3 0 0	£ s. d. 351 0 0	Excellent crop.
<i>Pinus Laricio</i>	291,000	8-12	3 0 0	873 0 0	Good crop.
" <i>Austriaca</i>	81,000	6-9	3 0 0	243 0 0	"
Totals	489,000	..	..	1,467 0 0	

SCHEDULE 4.—Trees transferred to Hanmer Springs Plantation.

Name of Tree.	Number.	Value per Thousand.	Total Value.	Remarks.
<i>Larix Europæa</i>	378,985	£ s. d. 2 5 0	£ s. d. 852 14 0	Very good growth.
<i>Pinus Laricio</i>	211,330	2 5 0	475 10 0	"
" <i>ponderosa</i>	50,425	2 5 0	113 9 0	"
" <i>muricata</i>	6,690	3 0 0	20 1 4	"
<i>Betula alba</i>	1,585	3 0 0	4 15 1	Good growth.
<i>Picea sitchensis</i>	56,480	3 0 0	169 8 10	Fair growth.
<i>Alnus glutinosa</i>	16,845	2 0 0	33 13 8	"
<i>Pseudo-tsuga taxifolia</i>	11,000	2 10 0	27 10 0	"
<i>Robinia pseudo acacia</i>	3,000	0 15 0	2 5 0	"
Totals	736,340	..	1,699 6 11	

T. B. CURLE,
Nurseryman in Charge.

TAPANUI NURSERY.

(Area, 120 acres; altitude, 500 ft.)

Rain fell on 157 days, with a total precipitation of 39·92 in., the maximum monthly fall being 8·99 in., in July. The highest shade temperature recorded was 88°, on the 5th February, and the lowest 24°, on the 12th July.

On the whole, the season has been most favourable for nursery operations. Excessive rain fell during July, but in the two succeeding months, when transplanting of seedlings was in progress, ideal weather-conditions prevailed, and enabled the work to be carried out cheaply and satisfactorily. Towards mid-summer a dry spell, lasting about two months, was experienced, but trees had developed sufficiently by that time to withstand the partial drought, which rendered general hoeing and weeding an easy matter.

Much success has attended nursery operations this season, but the destructive grass grubs still exist in large numbers, and were responsible for the failure of some thousands of larch.

Small amounts of oak and ash were sown during the winter, and gave fair results, but the latter seed again proved to be somewhat unsatisfactory, and this necessitated heavy sowing in drills. The present supply of ash-seed in pits, however, is in excellent condition, and a favourable germination of same may be anticipated in the coming spring.

The main sowing was commenced on the 10th October, and completed ten days later. The estimated number of seedlings raised is 2,527,000, valued at £2,590 10s.

Although the larch beds are not so successful as in the previous year, fully half a million plants should be sturdy enough for transference to lines next spring. The pines are an even crop, and compare favourably with former results. An experimental sowing of 12 oz. of *Thuja gigantea* produced over 30,000 small trees; but a trial of the new Abyssinian fibre plant, *Ka fumba*, was not so successful, as after the seed had germinated well, and plants had reached a height of about 5 in., an early frost destroyed the lot.

Transplanting of seedlings was commenced on the 17th of August, and during the ensuing seven weeks 1,367,500 trees were lined out, at a cost of 2s. 2d. per thousand. 770,000 smaller plants were also "lined in closely," at a cost of 5½d. per thousand.

A system of closer planting was adopted this year, and the labour-cost of dealing with the trees was greatly reduced. Nearly the whole of the one-year-old larch were transferred to lines, and a finer lot of trees has not been grown at this station. A large proportion have developed with remarkable vigour, and will require to be given specially sheltered situations on plantations. The lined-in trees average about 12 in. in height, and are most suitable for planting by the bar method.

The removal of about 40,000 *Pinus Laricio*, one-year-olds, to lines was attended with an unusual percentage of deaths, and this should prove conclusively that the system adopted here of allowing these pines to remain two years in beds before transplanting gives the best results. A number of *Sequoia sempervirens*, from Kurow Nursery, were lined out, and, although they have up to the present made excellent headway, it is more than likely that heavy frosts will establish the unsuitability of this class of tree for our locality.

Buildings, Improvements.—The steady increased expenditure in the item horse-shoeing and repairs was responsible for the Department's decision to carry on blacksmithing work at the nursery, and accordingly a roomy smithy, with all necessary appliances, was erected, and all horse-shoeing, plantation and nursery repairs are effected by the blacksmith, principally during wet weather, whilst the remainder of his time is devoted to general nursery work. The main stable building has been rendered considerably more serviceable by the addition of two extra stalls and loose-box for young horses, and the inclusion of a much-wanted shed for wagon and dray.

Arrangements are also well in hand for the extension of sizing-shed, as the amount of room available last winter was quite inadequate for satisfactorily dealing with nursery stock.

An area of about 12 acres used as a horse-paddock was drained with 2 in. tiles, ploughed, and sown in black oats, and extra returns fully justified the extra labour incurred.

About 11 acres of ground on lower portion of nursery was sown down in grass, and the erection of about 18 chains of fencing permits the using of this block for grazing purposes.

Shelter plantations are growing rapidly, and are now giving sufficient protection to the seed-beds without having to resort to our customary artificial method of scrub fencing. 1,200 shelter-trees, principally *Pinus muricata*, were planted on the boundary-line adjoining cemetery reserve, and these have, with few exceptions, grown well.

It is gratifying to report that the attack on *Pittosporum* hedges by the native scale has not been so persistent as in the two former years, and there is every reason to believe that the spread of the disease has been checked by judicious spraying.

The average number of men employed was 12·11.

Horse-feed to the value of £103 9s. 7d. was harvested from 23 acres. The oat-crop was a decided success, and there is every likelihood that our stock of oaten sheaf will more than meet requirements. About 9 tons of rye and clover and 3 tons of carrots were grown on spare blocks, but the latter produce is somewhat below the average quality.

The following items of labour were also included in list of expenditure: Formation and gravelling of roads, cultivating plantations, painting outbuildings, attending shrubbery and general maintenance.

Statements of expenditure and values are appended.

For the coming season arrangements are being made for the transference to local plantations of about 1,250,000 trees.

The following is a record of rainfall and temperature for the year :—

Month.	Rainfall.	Number of Days Rain fell.	Highest Reading of Thermometer.	Date.	Lowest Reading of Thermometer.	Date.
	Inches.		Degrees.		Degrees.	
1908.						
April ...	3·32	17	71	3rd	28	19th
May ...	1·86	11	65	6th	26	25th
June ...	4·29	16	66	5th	26	20th
July ...	8·89	18	52	4th	24	12th
August ...	2·76	10	56	14th	26	26th
September ...	0·86	6	69	15th	27	16th
October ...	3·74	16	78	11th	36	14th
November ...	2·04	12	75	29th	38	24th
December ...	4·14	16	79	26th	32	9th
1909.						
January ...	4·80	19	86	23rd	33	6th
February ...	1·19	7	88	5th	40	19th
March... ..	2·03	9	86	9th	40	29th
Totals ...	39·92	157	...	...	...	...

Statement of Expenditure.

	£	s.	d.
Amount at the 31st March, 1908	15,245	17	1
Tree-growing	1,150	15	6
General maintenance and repairs	150	11	1
Nursery-formation	82	19	10
Horse-feed purchased and grown	104	7	6
Manures	18	5	11
Tree-seeds	116	16	3
Tools, implements, &c.	78	1	6
Buildings, smithy and additions to stable	118	17	9
Fencing	9	2	1
Miscellaneous works	20	3	9
Proportion of Nurseryman's salary	150	0	0
Supervision	24	6	8
	£17,270	4	11

Value of Stock, Improvements, &c.

	£	s.	d.	£	s.	d.	£	s.	d.
Amount at 31st March, 1908	14,170	3	3			
Less value of trees at 31st March, 1908	6,738	19	9			
Less horse-feed in stock at 31st March, 1908	102	5	0			
Less tools written off during year	5	2	6			
				6,846	7	3			
Trees, as per Schedule 1				7,323	16	0
" " 2				2,590	10	0
" " 3				3,871	16	6
Tools and implements				1,907	0	6
Nursery-formation				78	1	6
Fencing				82	19	10
Buildings				9	2	1
Improved value				118	17	9
Horse-feed in stock				174	6	8
Value of young horses bred, or increased value, during year				103	9	7
							25	0	0
							£16,285	0	5

Summary.

	£	s.	d.
Value of present stock and general improvements	...	...	...
Value of trees sent out since initiation of nursery	...	...	...
	42,553	1	9
Expenditure to date	...	...	...
	17,270	4	11
Credit balance	...	...	...
	£25,282	16	10

Stock in Hand.

SCHEDULE 1.—Details of One-year-old Trees, grown 1908-9. (Twelfth Crop.)

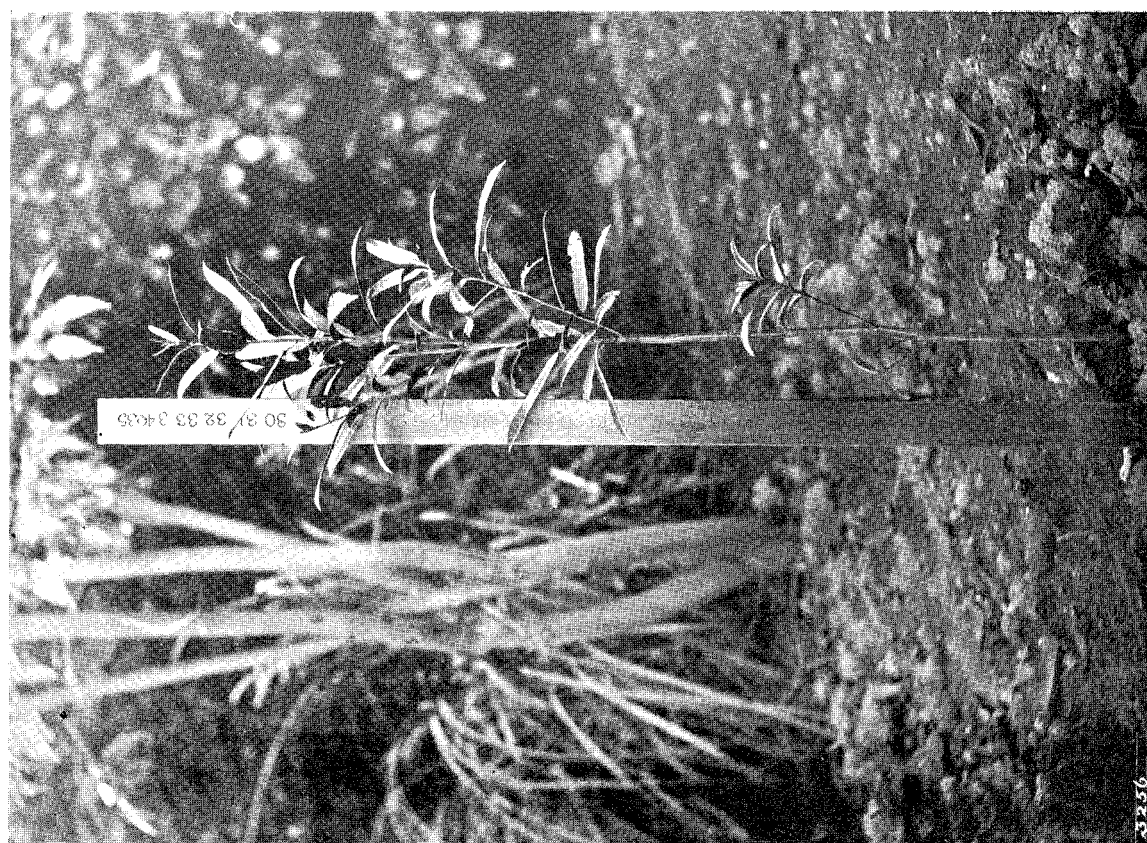
Name of Tree.	Number in Seed-beds.	Height in Inches.	Seed sown.	Value per Thousand.	Total Value.	Remarks.
Larix Europæa	1,500,000	2-5	Lb. 308	£ s. d. 1 0 0	£ s. d. 1,500 0 0	Excellent crop.
Pinus Laricio	400,000	1½	112	1 0 0	400 0 0	Fine strong plants.
" ponderosa	300,000	1½	36	1 0 0	300 0 0	"
" Benthamiana	100,000	1½	14	1 5 0	125 0 0	"
Pseudo-tsuga taxifolia	30,000	3	10	1 5 0	37 10 0	Well-grown plants.
Picea sitchensis	75,000	1	5	1 5 0	93 15 0	Fair crop.
Fraxinus excelsior	50,000	3	3 sacks	1 0 0	50 0 0	Germinated unevenly.
Betula alba	1,000	2	3 lb.	1 0 0	1 0 0	Germinated poorly.
Alnus glutinosa	11,000	4	3 lb.	0 15 0	8 5 0	Strong plants.
Quercus pedunculata	30,000	6	1½ sacks	1 0 0	30 0 0	Well-grown plants.
Thuja gigantea	30,000	1	¼ lb.	1 10 0	45 0 0	Germinated splendidly.
Totals..	2,527,000	..	..	..	2,590 10 0	

SCHEDULE 2.—Two-year-old Trees, grown 1907-8. (Eleventh Crop.)

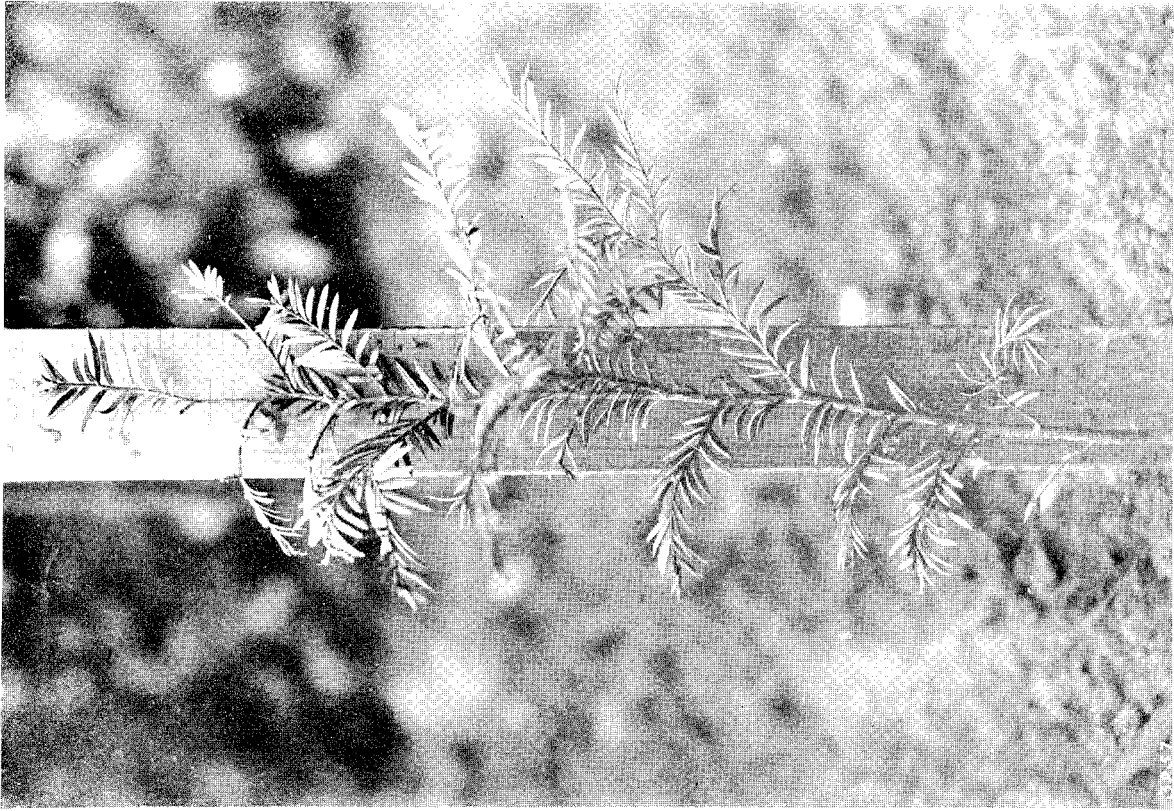
Name of Tree.	Number in Seed-beds.	Number in Nursery Lines.	Height in Inches.	Value per Thousand.	Total Value.	Remarks.
Larix Europæa	50,000	1,243,000	9-18	£ s. d. 1 5 0	£ s. d. 2,548 10 0	Unusually fine trees. Grub destroyed many.
Pinus Laricio	643,000	26,000	4	2 0 0	862 5 0	Satisfactory.
" ponderosa	7,000	44,000	4	1 5 0	107 15 0	"
" Benthamiana	41,000	..	6	2 5 0	51 5 0	"
Pseudo-tsuga taxifolia	..	16,500	8	1 5 0	41 5 0	"
Picea sitchensis	..	1,500	7	2 10 0	3 15 0	"
Fraxinus excelsior	7,000	..	14	1 5 0	8 15 0	Strong growth.
Acer pseudo-platanus	..	40,000	18	1 10 0	60 0 0	"
Betula alba	..	12,000	15	2 5 0	27 0 0	Very fine.
Alnus glutinosa	..	29,500	16	2 0 0	59 0 0	"
Quercus pedunculata	..	37,500	10	2 5 0	84 7 6	"
Fagus sylvatica	..	3,500	11	2 10 0	8 15 0	"
Sequoia sempervirens	..	600	7	6 0 0	3 12 0	Good progress.
Thuja gigantea	..	200	5	3 0 0	0 12 0	Uneven growth.
Various trees and shrubs	..	2,000	12	2 10 0	5 0 0	
Totals	748,000	1,456,300	..	..	3,871 16 6	
	2,204,300					



Pseudotsuga taxifolia (OREGON PINE)—7 YEARS OLD, 11 FT. HIGH.



Eleocarpus dentatus (HINAU)—7 YEARS OLD, 32 IN. HIGH.



Podocarpus ferrugineus (Miro)—7 YEARS OLD, 13 IN. HIGH.



Picea excelsa (Norway Spruce)—7 YEARS OLD, 18 FT. HIGH.

SCHEDULE 3.—Three-year-old Trees, grown 1906-7. (Tenth Crop.)

Name of Tree.	Number in Nursery Lines.	Height in Inches.	Value per Thousand.	Total Value.	Remarks.
			£ s. d.	£ s. d.	
Larix Europæa	4,000	18	3 0 0	12 0 0	Well-grown trees.
Pinus Austriaca	44,750	6	3 0 0	134 5 0	"
" Laricio	245,500	6	3 0 0	736 10 0	"
" ponderosa	3,750	7	3 0 0	11 5 0	"
" Benthamiana	5,250	7	3 5 0	17 1 3	"
" muricata	350	8	3 0 0	1 1 0	"
Picea excelsa	231,500	5-18	3 0 0	694 10 0	Strong and healthy.
" sitchensis	71,750	12	3 5 0	233 3 9	Strong trees.
Pseudo-tsuga taxifolia	3,700	10	3 5 0	12 0 6	"
Fraxinus excelsior	1,800	10	3 0 0	5 8 0	Sturdy trees.
" Americana	1,100	12	3 0 0	3 6 0	"
Quercus pedunculata	14,700	16	3 0 0	44 2 0	"
Acer saccharum	800	6	3 0 0	2 8 0	Not suitable here.
Totals	628,950	..	..	1,907 0 6	

SCHEDULE 4.—Trees transferred from Tapanui Nursery to Plantations, &c., 1908-9.

Where sent.	Name of Tree.	Number.	Height in Inches	Value per Thousand.	Total Value.	Remarks.
				£ s. d.	£ s. d.	
Conical Hills Plan- tation	Pinus Austriaca	10,000	12	3 0 0	30 0 0	These trees, with the exception of Picea excelsa, have done well.
	" ponderosa	29,475	12	3 0 0	88 8 6	
	" muricata	1,275	15	2 5 0	2 17 4	
	Picea excelsa	14,050	12	3 0 0	42 3 0	
	Pseudo-tsuga taxifolia	5,325	15	3 5 0	17 6 1	
	Fraxinus excelsior	5,725	15	3 0 0	17 3 6	
	" Americana	450	14	3 0 0	1 7 0	
	Quercus pedunculata	36,075	15	3 0 0	108 4 6	
	Acer pseudo-platanus	28,800	15	2 15 0	79 4 0	
	Betula alba	31,425	15	2 0 0	62 17 0	
Dusky Hill Planta- tion	Alnus glutinosa	4,775	15	3 0 0	14 6 6	Satisfactory results were obtained with all species planted, excepting Pinus Torreyana.
	Populus (vars.)	2,700	15	1 10 0	4 1 0	
	Totals	170,075			467 18 5	
	Pinus Austriaca	43,100	12	3 0 0	129 6 0	
	" Laricio	86,775	12	3 0 0	260 6 6	
	" ponderosa	31,125	13	3 0 0	93 7 6	
	" Benthamiana	17,825	14	3 5 0	57 18 7	
	" Torreyana	300	15	2 10 0	0 15 0	
	Picea excelsa	98,550	14	3 0 0	295 13 0	
	" sitchensis	75,450	15	3 5 0	245 4 3	
Conical Hills Planta- tion	Pseudo-tsuga taxifolia	10,400	14	3 5 0	33 16 0	Satisfactory results were obtained with all species planted, excepting Pinus Torreyana.
	Larix Europæa	136,200	15	3 0 0	408 12 0	
	Quercus pedunculata	1,000	14	3 0 0	3 0 0	
	Betula alba	18,500	16	2 5 0	41 12 6	
	Alnus glutinosa	3,000	15	2 0 0	6 0 0	
	Totals	522,225			1,575 11 4	
	As per details above	170,075	..	..	467 18 5
	"	522,225	..	..	1,575 11 4
	Tourist Department, Queenstown	Forest-trees	450	..	0 19 0	
	Burnham Industrial Schools	Trees and shrubs	2,585	..	8 14 3	
Lauder Domain Board	Forest-trees	1,600	4 8 6	Satisfactory results were obtained with all species planted, excepting Pinus Torreyana.
	Education Board, Greymouth	"	950	..	2 17 0	
	Tuapeka Domain Board	"	250	..	1 0 0	
	Clyde Domain Board	"	200	..	0 15 0	
	Te Oranga Home	"	500	..	1 10 0	
	H.M. Prison, Inver- cargill	Shelter-trees	1,200	..	2 14 0	
	Totals	700,035	..	..	2,066 7 6

SCHEDULE 5.—Trees, &c., received from other Nurseries, 1908-9.

Received from	Sent to	Name of Tree, &c.	Number.	Value per Thousand.	Total Value.
				£ s. d.	£ s. d.
Starborough Nursery ..	Dusky Hill Plantation ..	<i>Pinus Laricio</i> ..	175,000	3 0 0	525 0 0
		<i>Larix Europæa</i> ..	50,000	2 5 0	112 10 0
		<i>Pinus Laricio</i> ..	200,000	3 0 0	600 0 0
	Conical Hills Plantation ..	" <i>Austriaca</i> ..	73,000	3 0 0	219 0 0
		" <i>ponderosa</i> ..	3,150	3 0 0	9 9 0
		" <i>Benthamiana</i> ..	1,470	3 5 0	4 15 6
Eweburn Nursery ..	Tapanui Nursery ..	<i>Larix Europæa</i> ..	72,650	2 5 0	163 9 3
		<i>Pseudo-tsuga taxifolia</i> ..	550	3 5 0	1 15 9
		<i>Picea sitchensis</i> ..	100	3 5 0	0 6 6
		<i>Pyrus aucuparia</i> ..	200	3 0 0	0 12 0
		<i>Larix Europæa</i> ..	32,000	1 0 0	32 0 0
		<i>Pinus Laricio</i> ..	17,000	1 0 0	17 0 0
Kurov Nursery ..	"	" <i>Austriaca</i> ..	6,000	1 0 0	6 0 0
		" <i>ponderosa</i> ..	5,000	1 0 0	5 0 0
		<i>Sequoia sempervirens</i> ..	1,200	4 0 0	4 16 0
		<i>Cupressus majestigma</i> ..	150	1 10 0	0 4 6
		" <i>Goveniana</i> ..	150	1 10 0	0 4 6
		<i>Thuja Orientalis</i> ..	200	1 10 0	0 6 0
Starborough Nursery ..	"	<i>Pseudo-tsuga taxifolia</i> ..	500	1 5 0	0 12 6
		Tools, &c. ..	..	..	15 11 8
Totals ..	..	..	638,320	..	1,718 13 2

R. G. ROBINSON,
Nurseryman in Charge.

ROTORUA NURSERY.

(Approximate area, 85 acres; approximate altitude, 1,000 ft.)

The rainfall during the year was 52·10 in., which fell on 165 days, the maximum fall being registered in March, and totalled 8·42 in. The highest reading of the thermometer was 87°, on the 8th March, and the lowest 23°, on the 28th July and 2nd August.

During last winter 6,659,000 trees were dealt with. Lifting lined-out trees and counting and bundling these for sending to the plantations cost 1s. 8d. per thousand; sizing seedlings cost 2s. per thousand; lining out trees in nursery rows cost 1s. 8d. per thousand; mossing trees (including gathering moss and flax and heeling in the mossed trees) cost 11s. 5d. per thousand. Trees sent out from the nursery during the year to plantations, public schools, &c., number 4,491,510, and their value was £9,451 1s. 3d. (details of these may be seen on schedule 4 appended hereto); and since the inception of the nursery, 22,292,809 trees, valued at £46,460 5s. 9d., have been sent out. From seed, 4,395,500 trees, valued at £4,269, were raised during the year; and the number of trees raised since the inception of the nursery is 30,662,309, valued at £57,873 0s. 9d.

Seed-sowing was commenced early in October, and completed towards the middle of November. This work was favoured with fairly good weather, and the results are satisfactory, except with redwood.

Schedule 1 appended hereto gives the numbers and values of the trees raised from seed during the year. A comparison of this schedule with the previous year's one will show that the larch-crop from 672 lb. of seed is this year half a million less than the previous year from the same quantity of seed. This difference is undoubtedly due to the germinating quality of the seed. The growth made by the trees is good, and, as usual, about 25 per cent. will need to be removed for lining-out in the nursery.

Pinus Laricio is a remarkably good crop, being in respect to germination about 100 per cent. better than last year's crop. The growth made by the young plants is better than usual.

Pinus ponderosa and *Pinus Benthamiana* both germinated well and evenly, but the latter is evidently not true. The variety *Benthamiana* heretofore has always been quite distinct from the species, as a rule, making more growth, and being much lighter in colour. The seed of *Benthamiana*, too, is usually much larger than the seed of *ponderosa*, although both vary considerably, and sometimes are identical in size and general appearance. When seed-sowing was in progress it was noticed that the seeds of the two species in question were to all appearances identical, but this could not be proved until the young plants were compared.

Pseudo-tsuga taxifolia (Oregon pine) is a fairly good crop, and will probably need to be transplanted next spring.

Pinus Murrayana and *Pinus radiata* are both thick crops, and will be planted permanently next winter.

Sequoia sempervirens (Californian redwood) is almost a complete failure, 2,000 plants being the result from 20 lb. of seed. During the past eight years only one decent crop of this species has been obtained, the failures each time being due to the poor quality of the seed. When it is considered that the seed costs close on £1. per pound, it is questionable whether it is worth while attempting to grow this tree at all.

Thuja gigantea, *Acacia decurrens*, and *Alnus glutinosa* are each thick crops.

Eucalyptus Stuartiana is an excellent crop. The seed was sown a fortnight earlier than usual, in order that a trial might be made of planting these trees without previously mossing them. If it is possible to get them permanently planted by the middle of May next it is thought that they will then be sufficiently established to withstand the frost and cold weather usually experienced in July and August.

Two-year-old Seedlings (details in Schedule 2).—All these trees have made wonderfully good growth, and about 90 per cent. of them are fit for transferring to plantations for permanent planting.

Two- and Three-year-old Lined-out Trees (Schedule 2) are, on the whole, a first-rate crop. Among the larch the death-rate is practically nil, and the growth made is remarkably even. The pines, too, made good growth, and with very few losses except amongst the *Pinus Laricio*, where the death-rate is about 10 per cent. The work of lining out the above-mentioned trees was in progress from the 14th July to the end of August, and, except for occasional frosts, the work was completed under favourable weather-conditions.

The health of all classes of trees is remarkably good. The two-year-old seedling *Pinus Laricio* are slightly infested by a pine *aphis*, but have not been injured thereby to any appreciable extent. A few small patches of two-year-old larch seedlings are injured by the grass grub, but this pest is far from being prevalent. It would appear that the grass grub thrives only on land that has become somewhat dry and consolidated, such as the two-year-old seed-beds, as it is not noticeable amongst the lined-out trees or this year's seedlings. If this assumption is correct, then the trouble may have been mitigated by the frequent cultivating to which the beds were subjected.

Considerable improvements of a permanent character were effected during the year. A large building, comprising five compartments for vehicles, two loose boxes, and two rooms (each 12 ft. by 12 ft.), for use as a saddler's shop and an engine-room respectively, was erected. This building was much needed, and has been duly appreciated. A Tangye 4-horse-power oil-engine was installed for driving the oat-crusher, and the power has also been adapted to the saddler's sewing-machine and the grindstone. An addition of two rooms was made to the Nurseryman's cottage, and some small improvements made to the men's quarters.

The drainage was placed in an up-to-date state by the erection of a septic tank, accompanied by the usual sanitary conveniences.

Water-service.—This is now in very effective order. A 2 in. supply-pipe was laid from the town main, and connected with the nursery reticulation, the old reservoir on the hill behind the nursery being now used for storage of water in cases of emergency. Standpipes, with fire-hoses attached, have been placed near the buildings.

Seed-frames.—Two hundred seed-frames were erected with material that had been received from the Starborough Nursery, and all the seed-frames in use were painted on the iron parts, in order to prevent corrosion.

A further area of 9 acres was ploughed and sown down in grasses and clovers for use as a horse-paddock. The results are very satisfactory. Two young mares were purchased during the year.

A small packet of seed of *Asclepias semi-lunata*, a reputedly good fibre plant, was sown, but the results are unsatisfactory. This plant is a native of Uganda, and requires a hot humid climate for its successful cultivation. The seeds germinated well, and the young plants were transplanted into rows, where since November they have made, on an average, 6 in. of growth. A rich peaty soil, plenty of heat, and moisture are probably necessary for its best development.

Good progress has been made by 2,000 young flax plants which were planted last spring. All the odd corners around the nursery are now planted up in this manner, and some of the first lot planted are now fit to cut from. The quantity of the flax used in the nursery for tying up trees during the planting season is very considerable, so that these flax plantations should, in a few years, be a valuable asset.

Revenue received during the year amounted to £15 14s. 1d.—refunds, £15 11s. 7d.; and sale of trees, 2s. 6d.

The coming winter's work will consist in transferring about 4,500,000 trees to the Whakarewarewa and Waiotapu Plantations.

Details of expenditure and values are appended.

The following is a record of rainfall and temperature for the year :—

Month.	Rainfall.	Number of Days Rain fell.	Highest Reading of Thermometer.	Date.	Lowest Reading of Thermometer.	Date.
1908.	Inches.		*Degrees.		Degrees.	
April	3.11	14	75	16th	29	4th and 9th
May 28th	6.61	14	68	3rd	25	22nd
June	4.40	16	63	14th	24	21st
July 28th	3.35	15	58	21st	23	28th
August 2nd	3.81	11	62	31st	23	2nd
September	4.23	13	68	8th	27	12th
October	5.42	19	74	10th	28	31st
November	2.95	15	79	9th	37	7th
December	6.19	17	85	20th	34	9th
1909.						
January	3.47	12	84	24th	32	17th
February	0.14	3	84	17th	42	27th
March	8.42	16	87	8th	34	31st
Totals	52.10	165	...	...	...	...

Statement of Expenditure.

	£	s.	d.
Amount at 31st March, 1908	25,526	19	0
Tree-growing	2,270	6	5
General maintenance and repairs	518	8	9
Nursery-formation	40	4	7
Horse-feed	220	2	8
Manures	89	15	6
Tree-seeds	209	5	5
Tools, implements, &c.	220	4	10
Seed-frames	297	5	5
Water-supply	293	6	5
Buildings	493	2	0
Fencing	8	12	1
Miscellaneous works	6	7	11
Proportion of Nurseryman's salary, Foreman's wages, and clerical assistance	399	17	2
Supervision	24	6	8
	<u>£30,618</u>	<u>4</u>	<u>10</u>

Value of Stock, &c.

	£	s.	d.	£	s.	d.	£	s.	d.
Amount at 31st March, 1908	...	...	...	18,367	2	5			
Less value of trees	10,857	9	0						
" horse-feed in stock	42	0	0						
				<u>10,899</u>	<u>9</u>	<u>0</u>			
Trees, as per Schedule 1	...	...	...				7,467	13	5
" " 2	...	...	...				4,269	0	0
" " 3	...	...	...				6,288	15	0
" " "	...	...	...				855	0	0
Tools and implements	...	...	...				220	4	10
Water-supply	...	...	...				293	6	5
Seed-frames	...	...	...				297	5	5
Nursery-formation	...	...	...				40	4	7
Fencing	...	...	...				8	12	1
Buildings	...	...	...				493	2	0
Improved value	...	...	...				424	3	10
Horse-feed in stock	...	...	...				235	0	0
Value of young horses bred or increased value during year	...	...	...				10	0	0
							<u>£20,902</u>	<u>7</u>	<u>7</u>

Summary.

	£	s.	d.
Value of present stock and general improvements	20,902	7	7
Value of trees sent out since initiation of nursery	46,460	5	9
	<u>67,362</u>	<u>13</u>	<u>4</u>
Expenditure to date	30,618	4	10
Credit balance	<u>£36,744</u>	<u>8</u>	<u>6</u>

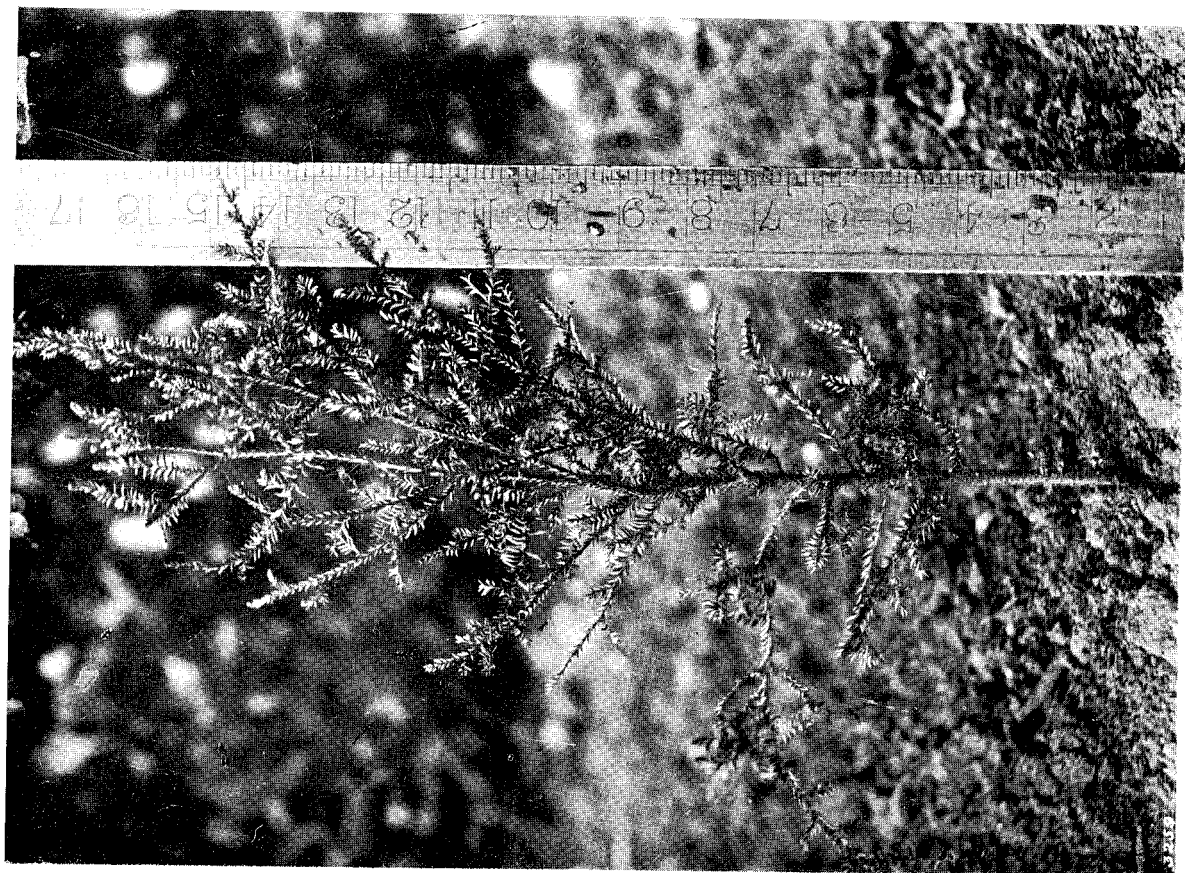
Stock in Hand.

SCHEDULE 1.—Details of One-year-old Trees, grown at Rotorua Nursery, 1908-9. (Tenth Crop.)

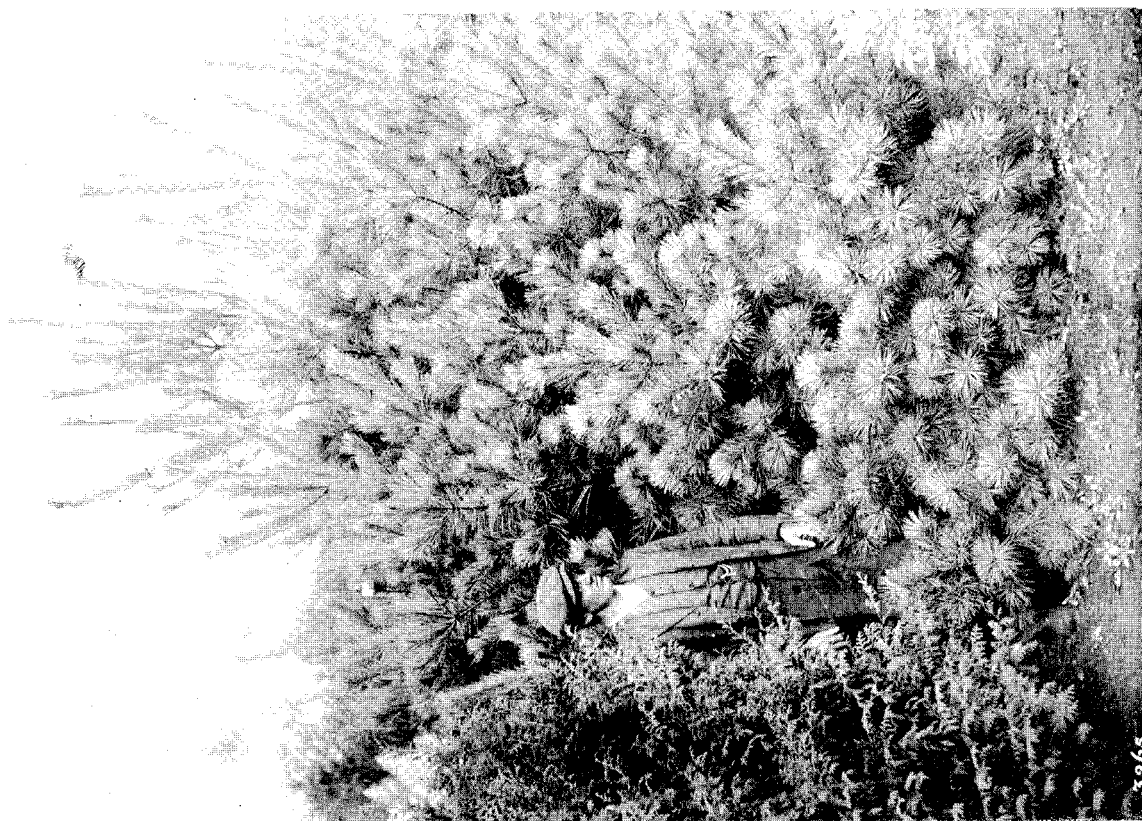
Name of Tree.	Number in Seed-beds.	Height in Inches.	Amount of Seed sown.	Value per Thousand.	Total Value.	Remarks.
Larix Europæa	2,500,000	1-6	Lb. 672	£ s. d. 1 0 0	£ s. d. 2,500 0 0	Thin crop, good growth.
Pinus Laricio	1,000,000	2	224	1 0 0	1,000 0 0	Very good.
" ponderosa	360,000	2	68	1 0 0	360 0 0	Satisfactory.
" var. Benthamiana	100,000	2	20	1 5 0	125 0 0	
Pseudo-tsuga taxifolia ..	30,000	3	10	1 5 0	37 10 0	Good.
Pinus Murrayana	2,500	3	1	1 0 0	2 10 0	Thick crop, good growth.
" radiata	6,000	4	2	1 0 0	6 0 0	
Sequoia sempervirens ..	2,000	4	20	4 0 0	8 0 0	Almost a failure, poor seed.
Thuja gigantea	25,000	1	3	1 10 0	37 10 0	Thick crops, good growth.
Eucalyptus Stuartiana ..	350,000	4	15	0 10 0	175 0 0	
Acacia decurrens	10,000	4	2	1 0 0	10 0 0	
Alnus glutinosa	10,000	3	5	0 15 0	7 10 0	
Totals	4,395,500	..	..	..	4,269 0 0	



Picea Sitchensis (Tideland Spruce)—7 YEARS OLD, 14 FT. HIGH.



Podocarpus dactyloides (Kahikatea, White-pine)—7 YEARS OLD, 18 IN. HIGH.



Pinus strobus (WEYMOUTH PINE)—7 YEARS OLD, 12 FT. HIGH.



Fagus Selandri (NATIVE BEECH)—7 YEARS OLD, 9 FT. HIGH.

SCHEDULE 2.—Two-year-old Trees, grown at Rotorua Nursery, 1907-8. (Ninth Crop.)

Name of Tree.	Number in Seed-beds.	Number in Nursery Lines.	Height in Inches.	Value per Thousand.	Total Value.	Remarks.
				£ s. d.	£ s. d.	
Larix Europæa	1,600,000	1,400,000	18	1 5 0	2,000 0 0	Remarkably good growth amongst all species.
Sequoia sempervirens .. ..	..	20,000	15	2 5 0	3,150 0 0	
Pseudo-tsuga taxifolia .. ..	..	45,000	6	6 0 0	120 0 0	
Pinus ponderosa .. ..	..	45,000	5	2 10 0	112 10 0	
" " var. Benthamiana .. ..	..	65,000	5	2 5 0	101 5 0	
" Laricio	500,000	..	4	2 10 0	162 10 0	
" strobis	14,000	..	4	1 5 0	625 0 0	
			3	1 5 0	17 10 0	
Totals	2,114,000	1,575,000	..	..	6,288 15 0	

SCHEDULE 3.—Three-year-old Trees, grown at Rotorua Nursery, 1906-7. (Eighth Crop.)

Name of Tree.	Number in Nursery Lines.	Height in Inches.	Value per Thousand.	Total Value.	Remarks.
			£ s. d.	£ s. d.	
Larix Europæa	250,000	15	3 0 0	750 0 0	Very good growth.
Pinus strobis	16,000	4	3 0 0	48 0 0	
" Laricio	10,000	4	3 0 0	30 0 0	
" Austriaca	9,000	5	3 0 0	27 0 0	
Totals	285,000	..	..	855 0 0	

SCHEDULE 4.—Trees, &c., transferred from Rotorua Nursery to Forest Plantations, &c., 1908-9.

Where sent.	Name of Tree.	Number.	Height in Inches.	Value per Thousand.	Total Value.	Remarks.
				£ s. d.	£ s. d.	
Whakarewarewa Plantation	Pinus Austriaca	6,300	4	3 0 0	18 18 0	The results are satisfactory except Sequoia sempervirens, which did not transplant well.
	Larix Europæa	8,175	6	1 0 0	8 3 6	
	" "	13,400	12	1 5 0	16 15 0	
	" "	858,350	12	2 5 0	1,931 5 9	
	" "	6,475	12	3 0 0	19 8 6	
	Sequoia sempervirens	24,000	5	4 0 0	96 0 0	
	Pinus Laricio	248,450	4	2 5 0	559 0 3	
	" ponderosa	113,000	4	2 5 0	254 5 0	
	" " var. Ben-	176,375	4	3 0 0	529 2 6	
	" "	19,600	4	2 10 0	49 0 0	
	" "	109,075	4	1 5 0	136 6 10	
	" Murrayana	10,225	6	3 0 0	30 13 6	
	Populus	600	36	3 0 0	1 16 0	
	Eucalyptus Stuartiana	351,900	6	1 10 0	527 17 0	
	" Amygdalina	50,750	6	1 10 0	76 2 6	
	" pauciflora	52,800	6	1 10 0	79 4 0	
Waiotapu Plantation	Acacia melanoxylon	5,050	6	1 0 0	5 1 0	All have succeeded except Sequoia sempervirens, amongst which the death-rate is somewhat heavy.
	Eucalyptus amygdalina	22,000	6	0 10 0	11 0 0	
	Acacia melanoxylon	1,725	6	1 5 0	2 3 1	
	Totals	2,078,250			4,352 2 5	
	Pinus Laricio	302,000	4	3 0 0	906 0 0	
	" "	392,000	4	2 5 0	882 0 0	
	" ponderosa	10,525	4	2 5 0	23 13 7	
	" "	70,000	4	3 0 0	210 0 0	
	" " var. Ben-	41,750	4	2 10 0	104 7 6	
	" "	21,250	4	3 5 0	69 1 3	
	" Austriaca	10,000	4	3 0 0	30 0 0	
	" strobis	19,750	4	1 5 0	24 13 9	
	Larix Europæa	300,000	6	1 0 0	300 0 0	
	" "	586,950	12	1 5 0	733 13 9	
	" "	355,050	12	2 5 0	798 17 3	
	" "	204,800	12	3 0 0	614 8 0	
Totals	Sequoia sempervirens	88,000	5	4 0 0	352 0 0	
	" "	2,200	7	6 0 0	13 4 0	
	Betula alba	3,000	12	2 5 0	6 15 0	
	" "	2,950	12	3 0 0	8 17 0	
	Ornamentals	348	..	6d. each	8 14 0	
	Totals	2,410,573			5,086 5 1	

SCHEDULE 4.—Trees, &c., transferred from Rotorua Nursery to Forest Plantations—*continued*.

Where sent.	Description.	Number.	Value.
			£ s. d.
Whakarewarewa Plantation	Details above	2,078,250	4,352 2 5
Waioapu Plantation	"	2,410,573	5,086 5 1
Native School, Oruanui	Shelter-trees	250	0 13 6
James Dunning, Waitomo	Larch	200	0 2 6
Hunua Scenic Reserve	Pinus ponderosa	2,000	4 10 0
Public School, Putaruru	Shelter and ornamental	100	1 9 6
Tourist Department, Rotorua	Liriodendron tulipiferum	100	5 0 0
Native School, Rotoiti	Shelter and ornamental	37	0 18 3
		4,491,510	9,451 1 3

H. A. GOUDIE,
Nurseryman in Charge.

RUATANGATA NURSERY.

(Area, 65 acres; altitude, 320 ft.)

Rain fell on 181 days during the year, with a total fall of 59·33 in., the maximum fall being in July, when 6·81 in. fell, on 26 days. Maximum temperature, 82°; minimum temperature, 28°. There were 13 frosts recorded, the maximum being 4°, on 1st and 8th August. It will be noticed that the rainfall for the year is much lower than that of the previous year, which was 95·66 in.; but, although there has been 36·33 in. less rain fallen, there has been no scarcity of water, as the rainfall was more evenly distributed throughout the year, as will be seen per record of rainfall attached.

The average temperature was also lower, being 54·16, against 55·33 last year; the prevailing winds being north and south-west.

In consequence of the cooler weather, the lined-out trees have not made the usual strong growth; but, at the same time, they are a good hardy looking lot, and quite large enough for transplanting.

There were 156,250 trees lined out, at an average cost of 3s. 5½d. per thousand. The lining-out season this year was a fairly good one, the work taking exactly two months, commencing on the 24th June. *Podocarpus totara* and juniper have done very well, and Californian redwood have made excellent growth, but tideland spruce have only made medium growth.

During the first week in September 80 lb. of *Podocarpus totara* seed, gathered locally, was sown; this germinated splendidly, and produced a fine crop of about 300,000 seedlings. 8 lb. of seed of *Sequoia sempervirens* was sown in November, with no results, the seed evidently being infertile.

The eucalypti-seed was sown at two different periods, to insure a good supply of trees at the proper time for the mossing, as this work extends over about five months. The first lot of seed was sown during November and the remainder late in December. 2 lb. each of the following species were sown: *Eucalyptus resinifera*, *E. rostrata*, *E. Stuartiana*, and 3 lb. of *E. amygdalina*: the whole of these have done well with the exception of the latter, which germinated rather thinly.

Owing to the scarcity of sphagnum moss, and the expense of procuring this, it has been decided to discontinue the mossing of the eucalypti in large numbers. A small planting of the different species unmossed was experimented with last season, and was a decided success, and it is intended to try a much larger quantity this season. It has also been decided to discontinue growing *Podocarpus totara*. Although these trees do well in the nursery, they are a complete failure when planted out permanently.

During the winter months 276,400 eucalypti and 5,600 *Acacia melanoxylon* were mossed by day-labour, costing 14s. 9d. per thousand; this includes all labour and expenses connected with the work. The total number of trees of all ages in the nursery at 31st March, 1909, was 832,500, valued at £1,601 7s. 6d.

The number of trees sent out to Puhipuhi Plantation during the season was 536,450, valued at £1,456 12s. 6d.

The approximate number of trees available for the plantation this season is 420,000; the total number of trees raised at the nursery since May, 1903, is 2,317,868, valued at £5,013 13s. 9d.

The total number of trees transferred to Puhipuhi Plantation since the inception of this nursery is 1,488,245, valued at £4,019 10s. 10d.

As reported last year, the various species of trees planted in the experimental plantation adjoining the nursery are doing well, with the exception of the break of *Eucalyptus pilularis*, consisting of about 250 trees, from 10 ft. to 20 ft. in height. These were attacked by the canker-worm, which was completely defoliating them; and it was decided to fell and burn these, in order to protect the remainder of the plantation from the pest, and, so far, this has proved effectual.

Quercus suber seedlings, reported to be doing well last season, have not made the growth that was anticipated, the majority of them still being about the same height. A few trees planted five years ago are doing well, being thoroughly established.

About 4 acres of very heavy fern land at the back of the nursery was burnt off, and, as time permitted, this was ploughed and cultivated, and is now fairly clean; it is proposed to sow this down in Algerian oats, in order to try and choke the fern.

Two swamps—one in the horse-paddock and another in the centre of the nursery—were drained by forming about 31 chains of stone and tile drains. The seed-bed ground was extended, also the water-service, and land graded for lining-out purposes.

A single line of Chatham Island kowhai, cabbage-trees, and flax were planted alternately on a narrow strip of land between the creek and the main road, running from the stable buildings to the entrance-gates. These are all doing well, and have improved the appearance of the place considerably. A few odd corners in the nursery were also planted up with shrubs and flax.

A small sowing of *Asclepias semi-lunata* (Native Baganda name, ka fumba) was made, and so far this has done well, being now in full bloom, and averaging 4 ft. 6 in. in height. The fibre is of fine quality, and appears to be very strong; but nothing can be said as regards growing this for commercial purposes at the present time, as the results of milling, &c., have to be considered. If this can be milled at a reasonable cost, being an annual, it should prove a payable crop to grow.

Oaten sheaves were grown to the value of £150.

The average number of persons employed was—Men, 6; women, 2·18; boys, 1·60: total, 9·78.

The following is a record of the rainfall and temperature for the year:—

Month.	Rainfall.	Number of Days with Rain.	Maximum Temperature.	Date.	Minimum Temperature.	Date.
1908.	Inches.		Degrees.		Degrees.	
April ..	5·35	14	72	2nd	40	8th and 25th
May ...	4·91	14	68	17th	30	31st
June ...	6·45	19	63	9th	30	1st and 20th
July ...	6·81	26	59	4th	28	31st
August ...	4·84	13	60	20th	28	8th
September ...	4·36	18	64	7th	34	2nd
October ...	4·63	18	68	10th and 22nd	38	31st
November ...	4·26	11	73	10th and 25th	40	14th and 16th
December ...	6·67	10	76	21st	43	9th and 14th
1909.						
January ...	3·68	13	82	7th	43	16th
February ...	0·89	10	77	16th	46	24th
March ...	6·48	15	75	1st	42	28th
Totals ...	59·33	181	...	...	...	...

Statement of Expenditure.

	£	s.	d.
Amount at 31st March, 1908	6,013	6	7
Tree-growing	762	3	10
General maintenance and repairs	98	9	3
Nursery-formation	128	7	1
Horse-feed purchased and grown	150	15	1
Manures	4	18	9
Tree-seeds	27	11	4
Tools, implements, &c.	24	14	9
Seed-frames	6	13	3
Water-supply	0	8	6
Buildings	29	7	6
Fencing	7	10	0
Miscellaneous works	3	11	4
Proportion of Nurseryman's salary	150	0	0
Supervision	36	10	0
	£7,444	7	3

Value of Stock, Improvements, &c.

	£	s.	d.	£	s.	d.	£	s.	d.
Amount at 31st March, 1908	...	...	...	4,949	10	7			
Less value of trees	1,715	4	3						
" horse-feed	72	0	0						
" one colt died	5	0	0						
				1,792	4	3			
							3,157	6	4
Trees, as per Schedule 1	...	...	...				940	0	0
" " " 2	...	...	...				661	7	6
Tools and implements	...	...	...				24	14	9
Water-supply	...	...	...				0	8	6
Seed-frames	...	...	...				6	13	3
Nursery-formation	...	...	...				128	7	1
Fencing	...	...	...				7	10	0
Buildings...	...	...	...				29	7	6
Improved value	...	...	...				186	10	0
Horse-feed in stock	...	...	...				150	0	0
							£5,292	4	11

Summary.

		£	s.	d.
Value of present stock and general improvements	...	5,292	4	11
Value of trees sent out since initiation of nursery	...	4,019	10	10
		9,311	15	9
Expenditure to date	...	7,444	7	3
Credit balance	...	£1,867	8	6

Stock in Hand.

SCHEDULE 1.—One-year-old Trees, grown at Ruatangata Nursery, 1908-9. (Sixth Crop.)

Name.	Number in Seed-beds.	Height in Inches.	Seed sown.	Value per Thousand.	Total Value.	Remarks.
			Lb.	£ s. d.	£ s. d.	
Podocarpus totara ..	300,000	3	80	2 10 0	750 0 0	Splendid plants.
Eucalyptus Stuartiana ..	100,000	3	2	0 10 0	50 0 0	"
" rostrata ..	160,000	3	2	0 10 0	80 0 0	"
" resinifera ..	90,000	3	2	0 10 0	45 0 0	"
" amygdalina ..	30,000	3	3	0 10 0	15 0 0	"
Totals ..	680,000	..	..	..	940 0 0	

SCHEDULE 2.—Two-year-old Trees, grown 1908-9.

Name.	Number in Nursery Lines.	Height in Inches.	Value per Thousand.	Total Value.	Remarks.
			£ s. d.	£ s. d.	
Podocarpus totara ..	136,000	12	4 5 0	578 0 0	Good healthy trees.
Juniperus Virginiana ..	2,000	12	3 0 0	6 0 0	"
Sequoia sempervirens ..	11,000	14	6 0 0	66 0 0	"
	149,000			650 0 0	
Picea sitchensis 4-year-old trees)	3,500	10	3 5 0	11 7 6	Good and sturdy.
Total ..	..	..	..	661 7 6	

SCHEDULE 3.—Trees transferred from Nursery to Puhipuhi Plantation, 1908-9.

Name.	Number.	Value per Thousand.	Total Value.	Remarks.
		£ s. d.	£ s. d.	
Podocarpus totara..	215,000	4 5 0	913 15 0	Doing fairly well.
" dactydiodes ..	1,950	1 10 0	2 18 6	"
Picea sitchensis ..	11,800	2 10 0	29 10 0	Doing very well.
Juniperus Virginiana ..	600	3 0 0	1 16 0	"
Acacia melanoxylon ..	5,600	2 0 0	11 4 0	"
Sequoia sempervirens ..	18,000	4 0 0	72 0 0	Growing slowly.
Pseudo-tsuga taxifolia ..	180	2 10 0	0 9 0	Growing slowly. 50 per cent. dead.
Eucalyptus rostrata ..	116,000	1 10 0	174 0 0	Doing well.
" Stuartiana ..	75,000	1 10 0	112 10 0	Doing exceedingly well.
" resinifera ..	40,000	1 10 0	60 0 0	"
" amygdalina ..	28,000	1 10 0	42 0 0	Very slow growth.
" redunca ..	24,320	1 10 0	36 10 0	Nearly all dead.
	536,450	..	1,456 12 6	
4 tons oaten chaff, at £6 per ton ..	..	..	24 0 0	Sent to Rotorua Nursery.
			1,480 12 6	

A. GORDON,
Nurseryman in Charge.

DUSKY HILL PLANTATION, OTAGO.

(Area, 845 acres; altitude, 400 ft. to 800 ft.)

Special attention was directed towards the replanting of burnt-out area, and, although this object was almost accomplished, an unusual number of trees failed to succeed, and it is estimated that about 100,000 pines and larch will be required for replanting purposes during the ensuing year.

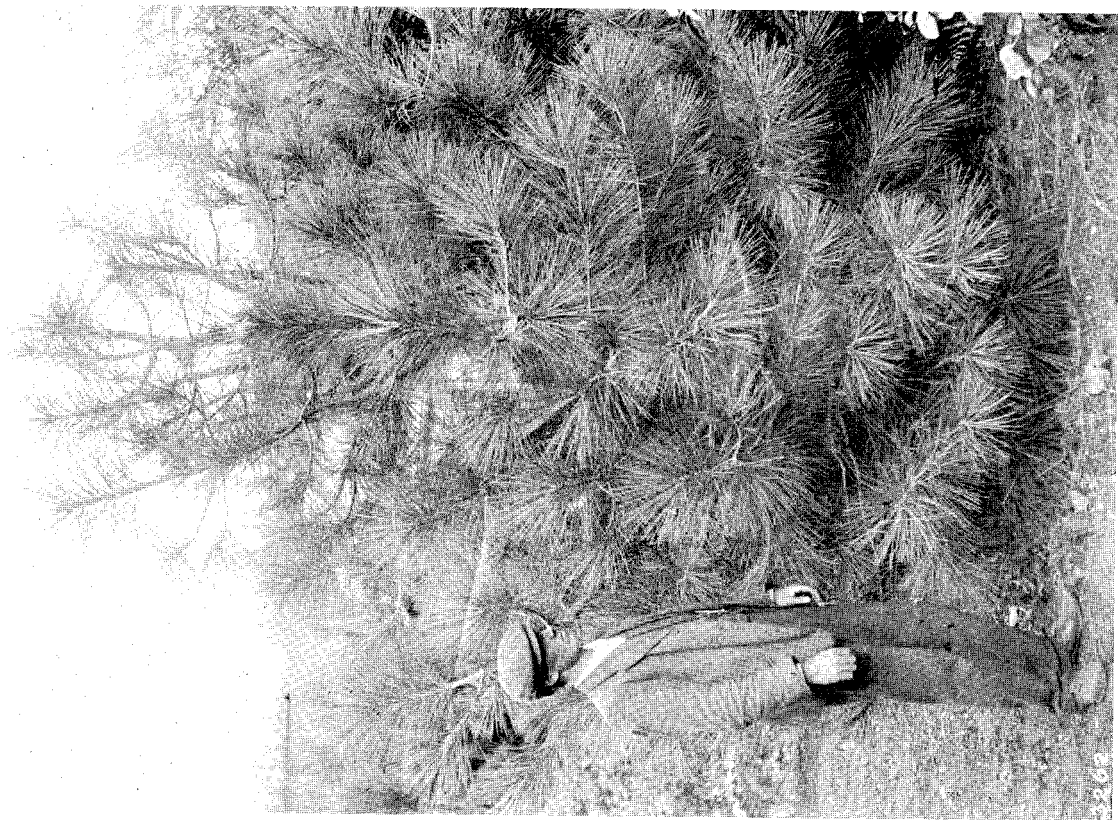
There were 522,225 trees, as per Schedule 4, received from the Tapanui Nursery, and 175,000 from the Starborough Nursery. The pines from the latter station were apparently well grown, but had evidently suffered in consequence of prolonged confinement in bundles and cases, and a heavy death-rate was not unexpected. The dry spring immediately following their transference



Podocarpus totara (TOTARA)—7 YEARS OLD, 6 FT. HIGH.



Pinus Laricio (CORSIKAN PINE)—7 YEARS OLD, 12 FT. HIGH.



Pinus ponderosa (AMERICAN YELLOW-PINE)—7 YEARS OLD, 11 FT. HIGH.



Knightia excelsa (REWAREWA, HONEYSUCKLE)—7 YEARS OLD, 21 IN. HIGH.

to permanent positions also assisted in minimising the success in dealing with these trees from Marlborough.

There were 449,725 trees planted in grubber pits, at 11s. 4½d. per thousand; and 247,000 by the bar method, at 9s. 3d. per thousand.

The amount of ground planted for the year was 300½ acres, and the total area under trees at present is 806 acres, containing 1,973,392 trees. It may be mentioned that throughout the burnt-out block a fair proportion of trees have revived, and these were pruned and allowed to remain.

There were 133,848 grubber pits prepared by day-labour, at 12s. 10d. per thousand; and 76,077 scuffled spots, for bar-planting, at 9s. 6d. per thousand.

The formation of 34 chains of ditching was necessary to carry off surplus water from an area where excessive moisture was proving detrimental to young trees, and 16 chains of new track was also made, to enable employees to reach various parts of the plantation with greater facility.

Fire-breaks were again ploughed and disc-harrowed, this work being considerably lighter than in the previous year, when about 35 acres was broken up for the first time. During mid-summer a grass-fire from an adjoining property approached the plantation enclosure, but the employees had no difficulty in suppressing the flames at the boundary fire-break before any damage was done.

The season has been an excellent one for tree-growth generally, and in no previous year has such marked progress been made by the different species established at this station. The absence of the customary early spring growth of larch was very noticeable; but subsequently, when copious rains had fallen, a steady growth was made, and numbers have increased in height by over 3 ft.

Heavy winds experienced during September proved destructive to the leaders of *Picea sitchensis* and *P. excelsa*. The damage is, of course, not irreparable, but it means, at least, the loss of a year's growth to the trees affected, and also additional work in pruning. The pines continue to put on sturdy growth, and the shelter created by these trees is proving beneficial to the slow-growing hard woods—oak, ash, and sycamore. The *Juglans regia* (walnuts) and *Castanea sativa* (sp. chestnuts) that are occupying sheltered positions in one of the old broadleaf gullies are rapidly developing into fine trees, and now average about 7 ft. high.

The Pomahaka River, which forms the south and western boundaries to the plantation, was much affected by the scanty rainfall during the summer, and quite failed to check the ingress of stock from property on the opposite side. No damage resulted, however, although at times difficulty was experienced in ejecting the cattle from the reserve. As may be expected, a few rabbits also succeeded in gaining access during the dry season, but by systematic trapping and poisoning no traces of the pest are now seen.

The presence of deer on local plantations made it necessary to obtain a permit for destroying same, and one of the employees managed to shoot a stag after a number of nut trees had been barked by the intruder. An expenditure of £507 13s. was incurred in the general upkeep of plantation. This item included the removal of undergrowth from around trees, tree-pruning, cutting scrub, and mowing noxious weeds. For the next season preparations are being made to complete all replanting of failures, and this work may be carried out satisfactorily by the ordinary maintenance staff of five men.

A statement of expenditure is appended.

Statement of Expenditure.

	£	s.	d.
Amount at 31st March, 1908	10,314	9	5
Pitting	122	6	2
Tree-planting	369	15	4
Formation	4	14	6
Clearing	1	19	7
Cartage of trees and railage	73	0	5
General upkeep of plantation	507	13	0
General repairs	10	1	6
Tools, implements, &c.	4	19	8
Miscellaneous works	14	8	11
Salaries—			
Free labour	30	0	0
Nurseryman's proportion of	22	0	0
Supervision	24	6	8
	£11,499	15	2

F. BENFELL, Plantation Foreman.

R. G. ROBINSON, Forester in Charge.

CONICAL HILLS PLANTATION, OTAGO.

(Area, 3,672 acres; altitude, 400 ft. to 1,050 ft.)

Tree-planting operations at this station were carried out under fairly satisfactory conditions, although a dry spell of weather, with an occasional strong south-west wind, naturally helped to increase the death-rate in trees planted.

There were 350,920 trees, as per Schedule 4, received from Starborough Nursery, and 170,075 from Tapanui Nursery. Although the trees from Marlborough appeared to be well packed, some of the consignments were subjected to an extended delay during transit, and a considerable number of *Pinus Laricio* became heated in consequence.

There were 390,500 trees planted in grubber pits, at 15s. 9½d. per thousand; and 73,041 by the bar method, at 12s. 6½d. per thousand.

The new area planted during the year amounted to 170½ acres, and the total area under trees at present is 1,252½ acres, containing 3,777,120 trees. 57,454 trees were also used in replanting previous failures. 340,625 grubber pits were prepared by contract, at £1 per thousand; and 260,991 scuffled spots for bar-planting, by day-labour, at 10s. 1¾d. per thousand.

On the whole, the results attained by the bar-planting system are sufficiently encouraging to merit the continuance of the method; winter planting with the bar, however, cannot be recommended for this district, as, no matter how careful a planter may be in closing the crevice made, a heavy frost will invariably loosen the young tree, which, if not attended to, is quickly rendered useless. It may be mentioned that an improvement has been effected in the bars used for the work by widening the blade, and this will dispense with the cramping of roots that has hitherto been found unavoidable when dealing with the larger-sized trees.

On the extension property an expenditure of £39 9s. 7d. was incurred under the heading of "Formation." The Rangleburn Gorge route being considered favourable for the conveyance of trees, 40 chains of roading and 5 chains of cuttings were formed, at 7s. 4½d. per chain, and no difficulty should arise, even in frosty weather, in carriage of trees from Tapanui. 70 chains of new fire-breaks, 100 ft. wide, was made on the summit of the leading range, at 5s. 11½d. per chain, and this forms the main break between the planted and extension blocks.

Horse-work here has now become a big item, but this year it was possible at intervals to work two teams from Tapanui, and fire-break labour was completed earlier than usual.

Trees established have made exceptionally vigorous growth during the past season, and one large break of *Pinus ponderosa* and *P. Benthamiana* occupying an exposed south-westerly situation may be singled out for favourable comment. These pines for two years only made the usual headway, but there are many that have added over 2 ft. to their height this year, while the average should reach about 18 in. Larch still proves to be the fastest-growing tree dealt with, and also the least expensive as far as maintenance work is concerned.

Pinus Laricio and *P. Austriaca* are both consistent growers here, although the former variety, after becoming fully established, produces foliage of a more healthy colour than the latter. The hardwoods are growing strongly in gullies, and it is anticipated that the cutting-back to ground-surface of bark-bound oak and ash will be the means of inducing the trees to make new strong leaders. A better report of the spruces can be given than formerly, although it only requires a comparatively light frost to destroy their delicate leaders, and pruning must always be considered a costly item in these blocks. The extension property being approximately three miles distant from old camps, it was necessary to provide additional accommodation for employees at a more convenient site, and three well-finished buildings, 18 ft. by 12 ft., were erected, at a cost of about £65 each.

General repairs and additions were also made to the Forester's house on lower plantation, and minor repairs effected to the building on extension property. The latter dwelling-house, which is now occupied by one of the Foresters, is in a state of decay, and the whole place has fallen a prey to the destructive wood-borer. The erection of a cottage here would dispense with the necessity of almost continual repairing, and be greatly appreciated by the Forester.

The area originally enclosed being planted, the main gang of employees are at present occupied in pitting on extension block. A considerable amount of labour, however, was necessary in tree-pruning, cleaning around trees, and replanting failures on old block, and the recent appointment of an additional Assistant Forester to carry on this work has been attended with success.

Rabbiting has been steadily proceeded with, and trees may now be transplanted to their permanent positions on the extension area without any likelihood of interference by the pest.

Owners of adjoining properties settled their fencing accounts in full, and the total receipts, amounting to £123 13s. 10d., were transmitted to the Receiver of Land Revenue.

A statement of expenditure for the year is appended.

The average number employed was 15·52 men.

Statement of Expenditure.

	£	s.	d.
Amount at 31st March, 1908	9,686	17	11
Pitting	473	4	0
Tree-planting	354	9	11
Formation	37	9	7
Cartage of trees and railage	93	3	5
General upkeep of plantation	507	4	10
" repairs	98	0	4
Horse-feed purchased and grown	11	7	2
Buildings, employees' quarters	198	11	7
Tools, implements, &c.	22	6	3
Miscellaneous works	35	10	4
Salaries—			
Foresters	295	0	0
Nurseryman's proportion of	40	0	0
Supervision	24	6	8
	<u>£11,877</u>	<u>12</u>	<u>0</u>

W. HOWE,
W. G. MORRISON, } Assistant Foresters.
R. G. ROBINSON, Forester in Charge.

GIMMERBURN PLANTATION RESERVE.

(Area, 1,200 acres; altitude, 1,200 ft.)

Owing to the dry spell during the spring, the trees planted have not done well, but those planted during the first year of operations here are doing fair.

The number of trees planted for the year was 101,460, all of which were used up to fill blanks.

The area planted to date is 173½ acres.

The cost of planting and digging (half-pits) was 15s. 6½d. per thousand.

An area of 24 acres was sown down in oats, the yield being 15 tons. 105 acres of self-sown oats was also cut, yielding 35 tons.

Oats and sheaf to the value of £73 8s. 2d. were transferred to nurseries, and the value of oats in stock is £112.

The expenditure for the year amounts to £366 11s. 11d., and the expenditure to date £2,366 6s. 2d.

The average number of hands employed was 1·56 (wages).

Statement of Expenditure.

	£	s.	d.
Amount at 31st March, 1908	1,999	14	3
Tree-planting	85	17	4
Cartage of trees	9	2	0
General upkeep of plantation	72	15	5
Horse-feed purchased and grown	144	10	6
Salaries, Nurseryman's proportion of...	30	0	0
Supervision	24	6	8
	<u>£2,366</u>	<u>6</u>	<u>2</u>

A. W. ROBERTS,
Nurseryman in Charge.

NASEBY SURVEY PADDOCK PLANTATION.

(Area, 175 acres; altitude, 1,900 ft.)

During the year the trees at the above plantation have made very satisfactory growth; the heavy snow-fall in July gave the land a good soaking, with the above results.

The trees that are doing best are *Pinus ponderosa*, *Pinus Benthiana*, and *Pinus Laricio*, *Pinus Austriaca* and *Larix Europæa* being somewhat slower.

Trees to the number of 31,200 were planted out, at an average cost of 18s. 5d. per thousand.

21,650 laburnums were also carted, and 10,000 were planted close with the plough, at a cost of £1 1s. 6d., the remainder being heeled in for future use. These are planted for protection to the other species from hares and rabbits, and since planting fourteen hares were caught in traps alongside. The area planted was 10½ acres, making a total to date of 143 acres.

The number of trees in the plantation to the 31st March, 1909, was 389,285.

The expenditure for the year was £193 2s. 2d., and the total expenditure to date is £2,266 12s. 7d.

An area of about 200 acres is to be taken in on what is known as the Naseby Commonage, and a further extension of the above will be carried out here. Arrangements are being made to have it ready for planting in the coming spring.

The average number of hands employed was 1·20 (wages).

Statement of Expenditure.

	£	s.	d.
Amount at 31st March, 1908	2,073	10	5
Tree-planting	28	11	3
Cartage of trees	4	11	0
General upkeep of plantation	105	18	3
Salaries, Nurseryman's proportion of...	30	0	0
Supervision	24	6	8
	<u>£2,266</u>	<u>12</u>	<u>7</u>

A. W. ROBERTS,
Nurseryman in Charge.

HANMER SPRINGS PLANTATION.

(Area, 1,488 acres; altitude, 1,225 ft.)

Tree-planting operations at this station during the past year have been attended with exceptionally favourable results, and the trees of all ages throughout the plantation have made much better growth than during the last few years.

The percentage of failures amongst trees planted during the year is much smaller than usual, and it is estimated that not more than 5 per cent. of losses have occurred amongst all species of trees planted. These losses have been almost entirely confined to where the trees were planted on dry gravelly soil.

The total number of trees planted during the year was 568,060, and the number used to replace blanks was 168,280 trees.

The area planted during the year was 208 acres, and the plantation now comprises 876 acres, containing 2,431,230 trees.

Free Labour.—The average daily number of free men employed was three, and the cost of the various works undertaken was as follows: Pitting for tree-planting, 12s. 6d. per thousand; tree-planting, 12s. 6d. per thousand; clearing round trees and cultivating fire-breaks, £112 18s. 6d.; pruning trees, £5 16s. 7d.; removal of Dumgree Prison Camp to Hanmer, £200; clearing for tree-planting, £1 per acre.

The clearing of growth from around the smaller trees necessitated a considerable amount of labour being expended, and during the summer months two men were constantly employed at this work.

Some ten miles of fire-breaks were ploughed and cultivated, and on portions of plantation this work was very difficult, owing to the stony nature of the ground.

Pruning was continued where necessary, and all trees which required attention in this respect were dealt with.

The replanting of blanks was done entirely by free labour.

The number of pits opened during the year was 435,000, and the number available for tree-planting to date (including pits dug by prison labour) is 303,202. Clearing for tree-planting amounted to 41 acres.

A fire-break 30 chains by $1\frac{1}{2}$ chains wide was ploughed through the centre of new plantation area, and four miles of fire-break half a chain wide was ploughed round plantation-boundary.

The growth of larch of all ages throughout the plantation has been remarkably good during the year, and amongst the older trees the vertical growth for the year varies from 12 in. to 48 in., while the average growth of trees planted during the year is 12 in.

Of the various pines planted, *Pinus Laricio* and *Pinus ponderosa* continue to show the best results, and these species may be safely planted on poor gravelly soils in this locality. The average vertical growth of trees planted during the year is 4 in., and the growth of the older trees varies from 12 in. to 30 in.

A considerable amount of labour has been necessary during the year in keeping hares and rabbits in check, and it has been necessary to provide a number of dogs for this purpose. No damage of any consequence has been done by these pests.

The results of ploughing fire-breaks on boundaries and through plantations has been entirely satisfactory, and no damage has been caused by fire.

Prison Labour.—The average number of prisoners employed at forestry work during the year was thirteen daily, and the average value of each prisoner's work for the year was £33 0s. 6d. The total value of prison labour for the year was £429 7s. 3d.

The details and values of work done by prisoners is as follows: Clearing for tree-planting, £71 1s. 10d.; pitting for tree-planting, £145 3s. 10d.; tree-planting, £136 5s. 4d.; maintenance, £56 10s.; road formation, £5 8s. 9d.; fencing horse-paddock, £4 10s.; building workshop, £1 16s. 3d.; miscellaneous works, £8 11s. 3d.

The pits opened numbered 323,893; trees planted, 431,490; clearing, 96 acres; road formation, 60 chains; fencing, 60 chains.

The details of expenditure for the year and expenditure to date are appended.

Statement of Expenditure.

	£	s.	d.
Amount at 31st March, 1908	4,374	4	1
Pitting	352	18	6
Tree-planting	42	7	0
Cartage of trees	5	4	6
General upkeep of plantation	281	9	11
Horse-feed purchased and grown	1	4	0
Fencing	34	4	6
Buildings	39	18	1
Tools, implements, &c.	56	18	0
Salaries—			
Supervision of prison labour	72	10	0
" free labour	72	10	0
Nurseryman's proportion of, and travelling-expenses	90	0	0
Supervision	36	10	0
Removal of prison camp	224	2	11
	£5,684	1	6

R. LEASK, Assistant Forester.

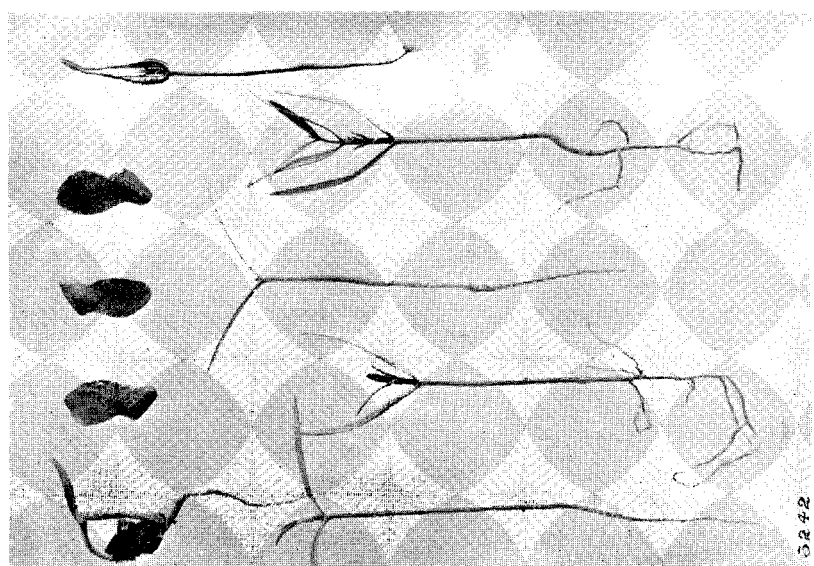
T. B. CURLE, Forester in Charge.



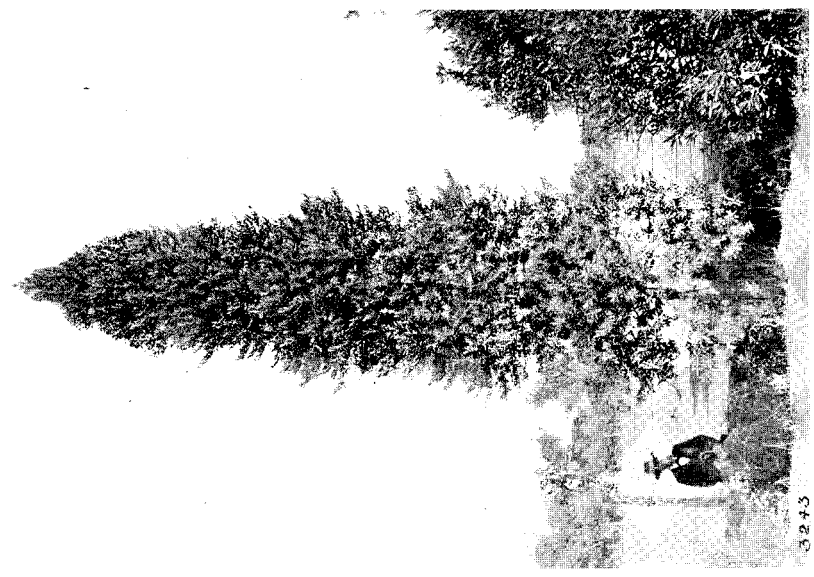
Sequoia sempervirens (CALIFORNIAN REDWOOD)—7 YEARS OLD, 25 FT. HIGH.



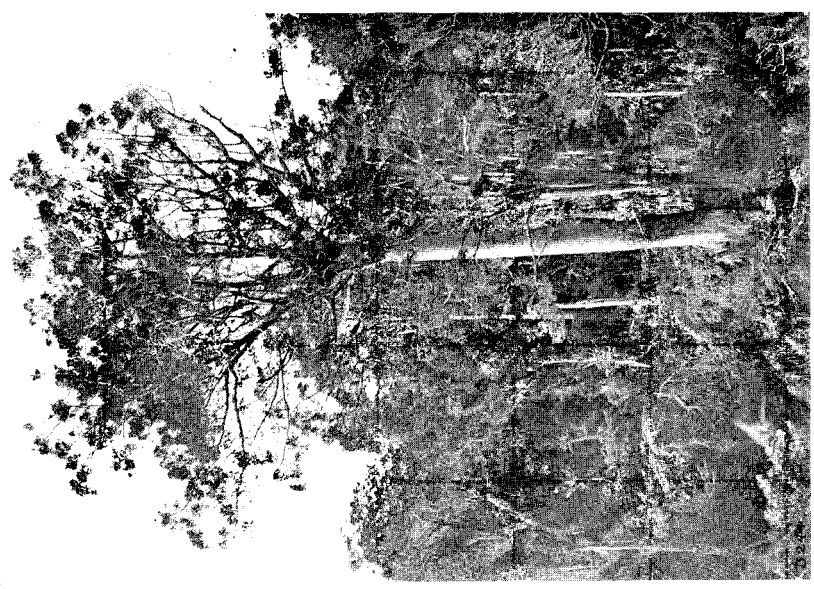
Fagus fusca (NATIVE BEECH)—7 YEARS OLD, 9 FT. HIGH.



(a.)



(b.)



(c.)

THREE STAGES OF *Agathis Australis* (KAURI): (a) SEEDS AND SEEDLINGS; (b) A TREE ABOUT 40 YEARS OLD; (c) A FULL-GROWN TREE.

KAINGAROA PLAINS EXPERIMENTAL PLANTATIONS, NEAR WAIOTAPU.

(Total area, 25 acres; approximate altitude, 2,000 ft.)

These four experimental areas are now being worked in conjunction with the Waiotapu Plantation, such work as pruning and attending to fire-breaks being performed by the prisoners.

R. MACRAE, Assistant Forester.

H. A. GOUDIE, Nurseryman in Charge.

WAIOTAPU PLANTATION.

(Approximate area, 6,700 acres; approximate altitude, 1,200 ft.)

The rainfall for the past year amounted to 42.06 in., falling on 93 days. The maximum temperature recorded during the year was 86° Fahr., in December and March; and the minimum, 17° Fahr., or 15° of frost, was registered in August.

Prison Labour.—The prison camp was shifted to a new site on the Maungakakamea Block about the end of April, 1908, and on this block the main portion of the work by prisoners was performed. The average daily number of prisoners employed during the year was 32.83, and the value of work done was £3,496 19s. 2d., or an average of £106 10s. 4d. per man. The work of shifting the prison camp was done almost entirely by prison labour. The new buildings erected comprise a store-room, a five-roomed building with a kitchen, officers' mess-room, scullery, bath and coal house, a bakehouse in which a portable oven is fitted, and a laundry and a lavatory. The stable was removed from the old site and re-erected with the addition of six stalls, a harness room, a carpenter's shop, and a large lean-to for housing the implements and vehicles. The smithy was also removed, and when re-erected a lean-to was built for storing tools. An efficient water-supply is obtained by lifting the water from a stream near the camp with a hydraulic ram to a concrete cistern on a near hill, from which the supply gravitates to the kitchen and where else it is required. From this camp the land will be planted in wedge-shaped blocks, and at the present rate of planting the camp will not need to be again shifted for about six years.

Tree-planting was commenced on the 12th April, and finished about the end of September, being delayed owing to extra work involved in shifting the camp. The prisoners planted 2,097,725 trees on a new area, 12,500 to replace failures in former years' planting, and 348 ornamental shrubs and plants about the camp site. Of the trees planted, larch, *Pinus ponderosa*, *Pinus Benhamiana*, *Pinus Austriaca*, *Pinus Strobus*, and birch have, as usual, succeeded satisfactorily, having made good growth, while the death-rate is very low. *Pinus Laricio* encountered severe frosts shortly after being planted, and the death-rate from this cause amounted to about 10 per cent.

Redwood was planted amongst the larch every 16 ft., and where sheltered have done best. Very little growth was made, as the majority of the trees were nipped back by the frost, but have since broken away from the bottom of the stem. As the larch fill out and afford more shelter the redwood will probably do better.

For next season's planting an area of about 800 acres has been cleared, and pits dug at 4 ft. apart. This land has been roaded and fire-breaks laid out. The road was also continued through an adjoining pastoral run, and connected with the Waimungu and Waiotapu Road. By carting the trees in by this road a good deal of time will be saved, as the road *via* Waiotapu is about four miles longer.

An area of 50 acres was ploughed and sown down in grass and clovers for use as a horse-paddock. A strip of land along the banks of a creek containing rough feed was enclosed for the horses, and used until the new paddock was fit to use. The want of good grass was badly felt, as it was about twelve months after shifting the camp before the new paddock was available. In this connection it seems advisable that the site for the future camp should be selected some years ahead, and an area sown down with grass and planted with a belt of shelter-trees.

Free Labour.—At the first prison-camp site a foreman was stationed with a gang of free men, who attended to such matters as replacing blanks in former planting and the maintenance of the plantation generally. During last winter this gang planted 64,700 trees on a new area, and 235,300 trees where deaths had occurred amongst trees previously planted. During the summer months most of the plantation was gone over and attended to by way of pruning, repairing roads, and attending to fire-breaks and fences. The back end of this block, which still remains unplanted, will be gradually dealt with by free labour, and preparations are now being made to plant half a million trees.

Fencing.—The Maungakakamea Block has now been enclosed with a post-and-wire fence, all but about a mile stretch, which will be completed shortly.

By free and prison labour 2,162,425 trees were planted on a new area of 794½ acres, and the total number of trees now growing at this plantation is 9,095,359, occupying an area of 3,523 acres.

The following is a record of rainfall and temperature for the year:—

Month.	Number of Days Rain fell.	Total Fall.	Maximum Fall.	Date.	Highest Reading of Ther- mometer.	Date.	Lowest Reading of Ther- mometer.	Date.
1908.		Inches.	Inches.		Degrees.		Degrees.	
April ...	10	3·66	1·25	21st	75	30th	37	18th
May ...	13	6·18	1·53	31st	70	2nd	24	22nd
June ...	10	2·90	0·75	4th	68	6th	20	21st
July ...	9	2·23	0·85	31st	60	1st	17	31st
August ...	9	3·65	1·13	17th	63	31st	17	1st
September ...	7	3·81	1·03	16th	67	7th	25	19th
October ...	10	3·76	1·40	2nd	79	9th	25	31st
November ...	3	1·37	1·20	19th	80	29th	25	3rd
December ...	4	4·06	1·50	23rd	86	19th	34	9th
1909.								
January ...	7	2·44	0·80	28th	83	23rd	30	17th
February ...	1	0·10	0·10	12th	83	16th	32	23rd
March ...	10	7·90	2·00	26th	86	1st	32	3rd
Totals ...	93	42·06	...	...	...	...	...	...

Statement of Expenditure.

	£	s.	d.
Amount at 31st March, 1908	5,209	17	3
Formation	90	8	0
Tree-planting	95	7	6
Clearing	56	3	0
Cartage of trees	108	10	0
General upkeep of plantation	377	17	5
" repairs	119	18	11
Horse-feed purchased and grown	144	3	11
Fencing	250	19	7
Buildings	370	3	3
Tools, implements, &c.	52	15	10
Miscellaneous works	3	0	0
Salaries—			
Supervision of prison labour	294	4	8
" free labour	123	7	6
Nurseryman's proportion of	42	15	6
Supervision	24	6	8
	£7,363	19	0

H. A. GOUDIE,
Nurseryman in Charge.

WHAKAREWAREWA PLANTATION.

(Approximate area, 8,912 acres; approximate altitude, 1,200 ft.)

During the past season trees to the number of 2,078,250 were dealt with. 1,841,100 were planted on a new area of 838½ acres, and the remainder—237,150—were used to replace failures in former plantings. The total area planted to date in this reserve is 3,157½ acres, containing 6,883,226 trees.

Prison Labour.—The employment of prison labour has again been attended with very satisfactory results, for which much credit is due to the Prisons departmental officers for the manner in which they have assisted to carry out the various works on which the men were employed. The daily average of men employed was 13·16, and their work was valued at £971 10s., or an average for the year of £73 16s. 5d. per man, thus showing an increase of 10s. 4d. per man on the previous year's results.

Free Labour.—An average daily number of 32·72 men were employed, and the cost of the various works undertaken was as follows: Clearing for tree-planting, £1 10s. 10d. per acre; pitting, 10s. 6d. per thousand; planting, 8s. 6d. per thousand; and formation of roads, including clearing line, £1 11s. 9d. per chain. Taken all round, the area planted during the past season was the roughest so far taken in hand, and the growth of manuka, tutu, and fern on it was very heavy. This accounts for the increase that will be noticed in the cost of clearing, pitting, and planting as compared with the cost of the same works during the past season.

In maintenance work the chief item was pruning, which was carried on amongst the older larch throughout the summer. A considerable amount of work was also done in keeping down the growth amongst the trees, and in the maintenance of fire-breaks.

In the early part of the year a camp was formed for convalescent consumptive patients from Cambridge Sanatorium, who were given employment planting trees at 8s. per thousand, and clearing at £1 per acre.

The average daily number of men employed from this camp for the past ten months was 7.15, and their total earnings amounted to £444 5s. 8d.

The erection of buildings and other works in connection with the new prison camp at Green Lake (Rotokakahi) are being rapidly pushed on, and it is expected that everything will be completed by the end of May.

The past season, as regards the general growth of trees throughout the plantation, has been a very good one, and all the trees planted this season have done fairly well with the exception of redwood, a large number of which were killed outright by frost soon after they were planted. Larch were also affected by frosts which occurred in October and November, but have since recovered, and have made very good growth. On the whole, the pines have done very well, although there are slightly more failures than usual amongst all species, chiefly owing to the dry weather at the time of planting.

Three species of eucalypti were planted, and all have done well, *E. Stuartiana* especially having made splendid growth, with very few failures amongst them.

Acacia melanoxylon has also made good growth, but all former plantings of this species have become affected by blight, from which it will take them some time to recover.

Preparations are in hand for planting about two million trees during the coming season. Details of expenditure are appended.

D. J. BUCHANAN, Assistant Forester.

H. A. GOUDIE, Nurseryman in Charge.

Statement of Expenditure.

	£	s.	d.
Amount at the 31st March, 1908	13,541	13	5
Pitting	1,030	19	2
Tree-planting	422	14	1
Clearing	1,663	1	1
Cartage of trees	58	16	11
General upkeep of plantation	460	16	8
" repairs	82	6	11
Horse-feed purchased and grown	105	15	1
Formation	268	4	3
Buildings, shifting prison camp	95	7	0
Tools, implements, &c.	49	6	1
Miscellaneous works	2	1	0
Salaries—			
Supervision of prison labour	160	0	0
" free labour	141	16	8
Nurseryman's proportion of	42	15	6
Supervision	24	6	8
	£18,150	0	6

PUHIPUHI PLANTATION.

(Area, 10,000 acres; altitude, 1,000 ft.)

With the exception of February, there has been a uniform rainfall through the year. For 169 days the total rainfall was 71.45 in. The heaviest fall was during March, 8.98 in. being recorded for sixteen days. Maximum temperature, 87°; minimum temperature, 24°.

There were 536,443 trees received from the nursery; from this number 35,500 were used in planting up blanks, due to total failure of *Pseudo-tsuga taxifolia* as noted in last year's report. 30,915 were utilised to replace blanks in 1906-7 planting, the new area occupied for the season being 387 acres. 1,488,238 trees have been planted out to date, on 1,512 acres. The average cost of tree-planting was 11s. 5d. per thousand, as against 11s. 8d. for the previous year.

Cartage on trees cost £58 16s. 4d. 470,950 spade and grubber pits were made, at an average cost of 16s. 4d. per thousand. No pits are available for next season's planting. 139 acres of standing dead timber and ti-tree was felled by hand-labour and contract, and cost at the rate of 4s. 4d. per acre; and 294 acres of fern land was burnt off, at 1s. 5d. per acre. About 100 acres is gravelly, and in places sour, the remaining area ranging from fair to good.

The chain wide fire-break formed last year has made a fair protection against fire; the chief drawback is getting cattle when they are most required. The settlers, naturally, will not put in stock until there is plenty of feed, consequently the fern is not destroyed as quickly as could be desired to make an efficient fire-break. 285 chains of boundary fire-break was cleared of fern and timber, at an average width of half a chain; of this, 65 chains was ploughed. 3,010 chains of boundary-fence line was scuffed with spades 3 ft. wide on each side of the fence.

There was 220 chains of fencing purchased at 3s., 80 chains at 2s., 18 chains at 4s. 6d., and 24½ chains at 3s. 6d. per chain. 20 chains of fencing was erected; the Department supplied the material, the adjoining settler the labour.

Two two-roomed houses were purchased, at a cost of £31 3s. 3d., including the haulage and re-erection of one of the houses to a convenient site, near to the stable, for the use of the horseman.

The season has been very favourable for tree-growing, but owing to part of the area being very poor, the results are not as good as might be expected. *Eucalyptus Stuartiana* have done exceptionally well, *E. rostrata* and *E. resinifera* have also made good growth; in many instances these have attained a height of 2 ft. Fully 20 per cent. of the *Eucalyptus amygdalina* have died, while *E. redunca* have been a complete failure. Some 400 of each species of eucalypti grown were planted unmossed, and the result is very gratifying. *E. Stuartiana*, *E. rostrata*, and *E. resinifera* have done equally as well as those that were mossed. In *E. redunca* the deaths were 25 per cent. and *E. amygdalina* about 11 per cent. With one exception these trees were planted on flat land, in rather better soil than the mossed trees.

The *E. Stuartiana* planted on a hillside stood the dry spell in February very well. This species has proved itself to be wonderfully adapted to this soil and climate; being a very sure grower, it has not been necessary to plant up the blanks in the break planted two seasons ago. One specimen of this planting has reached a height of 10 ft. 9 in.

Of the trees planted five years ago, there are several specimens of *E. redunca* 25 ft. high, the girths varying from 14 in. to 19 in.; also a few *E. rostrata* of a like height, with a 13 in. girth.

The *E. rostrata* and the *E. resinifera* are the best growers of the earlier plantings. *Podocarpus totara* being a very slow and somewhat uncertain grower against the vigorous growth of the fern, the cost of cleaning is necessarily great; it has been deemed advisable to discontinue planting this tree, the area now occupied with totara to be planted up with eucalypti.

Cleaning and planting trees and upkeep of fire-breaks, &c., cost £463 10s. 10d.

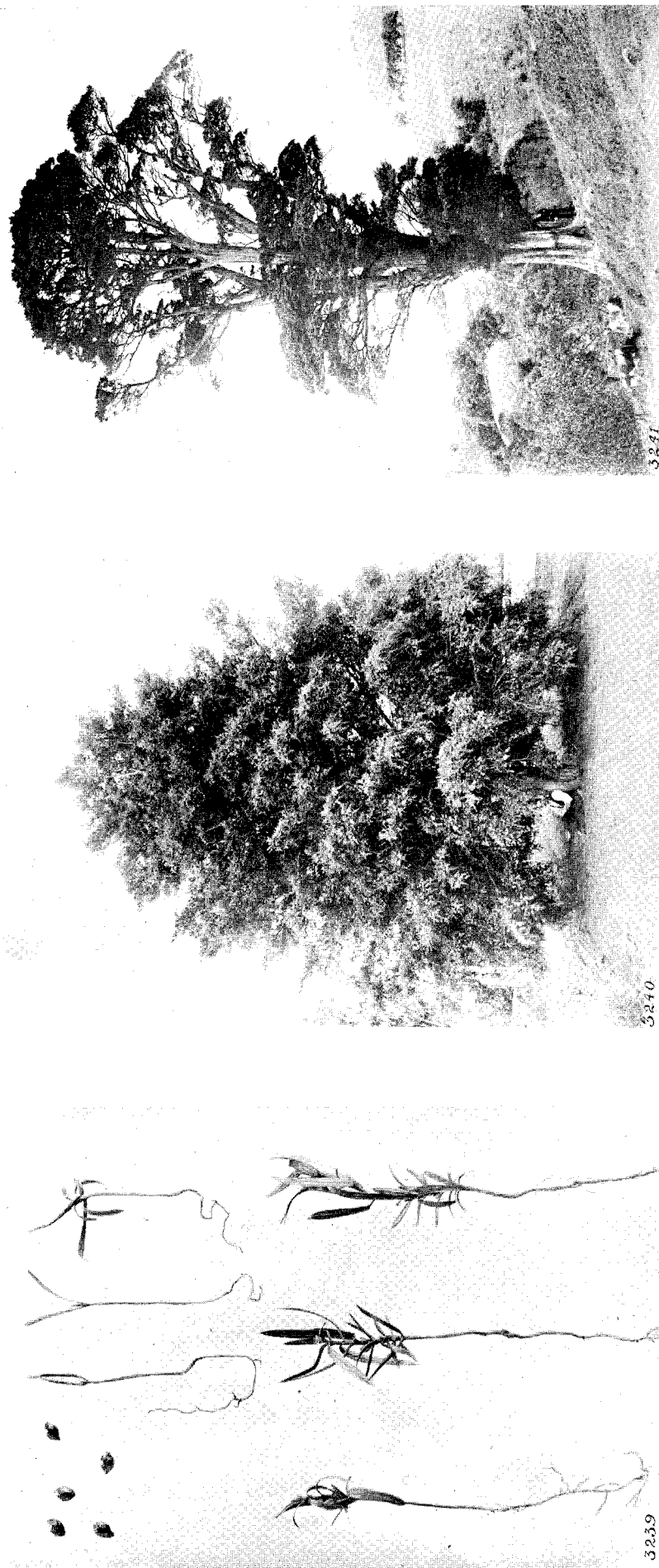
Average number of men employed, 9.92.

The following is a record of the rainfall and temperature for the year:—

Month.	Rainfall.	Number of Days Rain fell.	Maximum Temperature.	Date.	Minimum Temperature.	Date.
1908.	Inches.		Degrees.		Degrees.	
April	6.31	10	78	14th	40	24th
May	5.63	12	70	4th	30	31st
June	5.76	12	66	4th	32	19th
July	6.87	22	64	22nd	28	31st
August	8.52	16	64	22nd, 23rd, and 25th	24	7th
September	5.73	16	68	6th, 7th, and 21st	34	1st and 12th
October	5.26	20	74	6th and 8th	38	28th
November	5.52	13	78	10th, 24th, and 30th	38	15th
December	7.40	12	87	21st	44	2nd, 3rd, and 13th
1909.						
January	4.54	13	87	6th	42	16th
February	0.93	7	82	16th and 23rd	46	19th and 21st
March	8.98	16	80	2nd, 3rd, 5th and 6th	46	31st
Totals	71.45	169	...	...	...	...

Statement of Expenditure.				£	s.	d.
Amount at the 31st March, 1908	...	...	...	4,788	13	4
Pitting	...	...	...	386	18	9
Tree-planting	...	...	...	254	12	10
Clearing	...	...	...	46	17	6
Cartage of trees	...	...	...	58	16	4
General upkeep of plantation	...	...	...	463	10	10
" repairs	...	...	...	41	10	11
Horse-feed purchased and grown	...	...	...	18	15	1
Fencing	...	...	...	91	4	0
Buildings	...	...	...	43	15	3
Tools, implements, &c.	...	...	...	49	18	10
Miscellaneous works	...	...	...	5	3	9
Purchase of land	...	...	...	10	4	3
Salaries—						
Supervision of free labour, Forester's	...	...	...	170	0	0
Nurseryman's proportion of	...	...	...	20	0	0
Supervision	...	...	...	36	10	0
				£6,486	11	8

J. MASON, Assistant Forester.
A. GORDON, Forester in Charge.



(a.) (b.) (c.)
THREE STAGES OF *Podocarpus totara* (TOTARA): (a) SEEDS AND SEEDLINGS; (b) A TREE ABOUT 30 YEARS OLD; (c) A FULL-GROWN TREE.

WAITAHUNA PLANTATION, OTAGO.

(Dredged area, 12 acres; altitude, 331 ft.)

Residents of this district report that, owing to an unusually dry spring being experienced, agriculture generally was greatly interfered with, but no sign of even a partial drought is noticeable throughout the area planted under trees.

The distance of this station from Tapanui forbids frequent visits of a Forester, and the Department is indebted to a resident tree-planting enthusiast for his courtesy in supplying occasional reports relating to the progress of trees.

The species that gave the most promise of success during the first year's operations continue to thrive, particularly English birch, which have added in many cases 4 ft. to their height. Larch and alder are also developing beyond expectations, and the progress is more pronounced with each succeeding year. *Pinus ponderosa*, *P. Austriaca*, and *P. muricata* are all producing sturdy leaders, and many of these trees have attained a height of 3 ft. The spruces unfortunately experienced a sharp frost in September, and were unable to make a satisfactory recovery by the end of the growing season. Very little headway has been made by either oak, ash, or sycamore, although where the surface consists of a large proportion of clay deposit, the oak has shown to better advantage.

Gorse and bloom are spreading quickly, and, although an expenditure of £6 18s. was last year devoted to the cutting of same, a recent inspection of the plantation shows that urgent attention in this direction is again required. There is no doubt that the block, being surrounded by immense gorse bushes, will continue to be a germinating-ground for these noxious plants, and it would probably be advantageous to remove the varieties of trees that are not succeeding on the plantation and replace same with the fast-growing larch.

The river overflowed its banks and flooded a small portion of the reserve without creating any damage to trees or boundary-fence.

The expenditure for the year amounted to £14 10s. 6d., and gave employment to one man for three weeks.

Statement of Expenditure.

	£	s.	d.
Amount at 31st March, 1908	...	...	...
General upkeep of plantation	...	...	...
Nurseryman's proportion of salary, and travelling-expenses	...	...	...
	<u>£183</u>	<u>0</u>	<u>9</u>

R. G. ROBINSON,
Forester in Charge.

REFERENCE-LIST OF FOREST TREES AND SHRUBS GROWN AT THE VARIOUS NURSERIES AND PLANTATIONS, 1908-9. (E, EVERGREEN; D, DECIDUOUS.)

Name of Tree.	Synonym.	Common Name.	Habitat.
<i>Acacia melanoxylon</i> (E) ..	..	Blackwood	South-east Australia.
<i>Acer saccharum</i> (D) ..	<i>Acer saccharinum</i> ..	Sugar-maple	North America.
" <i>pseudo-platanus</i> (D) ..	..	Sycamore	Europe and Asia.
<i>Æsculus hippocastanum</i> (D) ..	..	Horse-chestnut	South-east Europe.
<i>Alnus glutinosa</i> (D) ..	..	Alder	Europe and Asia.
<i>Betula alba</i> (D) ..	..	Silver-birch	Europe.
<i>Berberis aristata</i> (D) ..	..	Barberry	Northern India.
<i>Castanea sativa</i> (D) ..	<i>Castanea vesca</i> ..	Sweet or Spanish chestnut ..	Europe and Asia.
<i>Catalpa speciosa</i> (D) ..	<i>Bignonia catalpa</i> ..	Hardy catalpa	United States.
<i>Chamaecyparis Lawsoniana</i> (E)	<i>Cupressus Lawsoniana</i>	Lawson's cypress, or white-cedar	Northern California.
<i>Cordyline Australis</i> (E) ..	" <i>Australis</i> ..	Ti, or cabbage-tree	New Zealand.
" <i>indivisa</i> (E) ..	" <i>indivisa</i> ..	Toi	South Island, New Zealand.
<i>Eucalyptus amygdalina</i> (E)	..	Almond-leaved peppermint-gum	Victoria, New South Wales, and Tasmania.
" <i>calophylla</i> (E) ..	..	Red-gum	South-west Australia.
" <i>capitellata</i> (E) ..	..	Head-flowered stringy-bark	New South Wales and Gippsland.
" <i>corymbosa</i> (E) ..	..	Bloodwood	New South Wales and South Queensland.
" <i>coccifera</i> (E) ..	..	Mountain-peppermint ..	Alpine districts of Tasmania.
" <i>corynocalyx</i> (E) ..	..	Sugar-gum	South-east Australia.
" <i>crebra</i> (E) ..	..	Narrow-leaved ironbark ..	New South Wales and Queensland.
" <i>ficifolia</i> (E) ..	..	Scarlet-flowering gum ..	South-west Australia.
" <i>globulus</i> (E) ..	..	Blue-gum	Tasmania and Victoria.
" <i>Gunnii</i> (E) ..	..	Cider-gum	Victoria, New South Wales, and Tasmania.
" <i>hæmastoma</i> (E) ..	..	Gum-topped stringy-bark ..	Tasmania and Victoria.
" <i>leucoxylon</i> (E) ..	<i>Eucalyptus sideroxylon</i>	Victorian red ironbark ..	South Australia.
" <i>macrorhyncha</i> (E) ..	..	Stringy-bark of Victoria ..	Victoria.
" <i>marginata</i> (E) ..	..	Jarra	South-west Australia.
" <i>Muellerii</i> (E) ..	..	Mountain red-gum	Mountains of Tasmania.
" <i>maculata</i> (E) ..	..	Spotted gum	New South Wales and Queensland.
" <i>obliqua</i> (E) ..	..	Stringy-bark or messmate ..	Victoria, New South Wales and Tasmania.
" <i>pauciflora</i> (E) ..	<i>Eucalyptus coriacea</i> ..	White or drooping gum ..	Ditto.

REFERENCE-LIST OF FOREST TREES AND SHRUBS GROWN AT THE VARIOUS NURSERIES AND PLANTATIONS, 1908-9. (E, EVERGREEN; D, DECIDUOUS)—*continued*.

Name of Tree.	Synonym.	Common Name.	Habitat.
<i>Eucalyptus paniculata</i> (E) ..	<i>Eucalyptus fasciculosa</i>	Red ironbark	New South Wales and South-west Australia.
" <i>pilularis</i> (E) ..	..	Blackbutt	New South Wales, Queensland, and Gippsland.
" <i>regnans</i> (E) ..	..	Swamp-gum	Tasmania and Victoria.
" <i>saligna</i> (E) ..	..	Grey or flooded gum ..	New South Wales and South Queensland.
" <i>Stuartiana</i> (E) ..	..	Apple-scented gum ..	Tasmania and South-east Australia.
" <i>Sieberiana</i> (E) ..	<i>Eucalyptus virgata</i> ..	Yowut, mountain ash ..	Ditto.
" <i>siderophloia</i> (E)	" <i>persicifolia</i>	Sydney ironbark	Eastern Queensland and Port Jackson.
" <i>teretecornis</i> (E)	..	Red-gum of Queensland ..	New South Wales and Gippsland
" <i>urnigera</i> (E) ..	..	Urn-bearing gum	Tasmania.
" <i>redunca</i> (E) ..	..	The wando or white-gum ..	Western Australia.
" <i>resinifera</i> (E) ..	..	Red or forest mahogany ..	New South Wales and Queensland.
" <i>viminalis</i> (E) ..	..	Swamp or manna gum ..	Tasmania and Victoria.
<i>Fraxinus Americana</i> (D) ..	<i>Fraxinus Acuminata</i> , F. <i>alba</i>	White American ash ..	Eastern United States.
<i>Fraxinus excelsior</i> (D) ..	..	English ash	Europe and Asia.
<i>Fagus sylvatica</i> (D) ..	..	Beech	Europe.
<i>Hikora ovata</i> (D) ..	<i>Carya alba</i>	Shagbark, hickory	Eastern North America.
" <i>pecan</i> (D) ..	" <i>olivæformis</i> ..	Pecan-nut	"
<i>Juglans cineria</i> (D) ..	..	Butternut	"
" <i>nigra</i> (D) ..	..	Black walnut	"
" <i>regia</i> (D) ..	..	Walnut	Europe and Asia.
<i>Juniperus Virginiana</i> (E) ..	<i>Juniperus Barbadosensis</i>	Red cedar	North America.
<i>Larix Europæa</i> (D) ..	<i>Pinus larix</i>	European larch	Europe.
<i>Liriodendron tulipiferum</i> (D)	..	Tulip-tree, basswood ..	United States.
<i>Laburnum vulgare</i> (D) ..	<i>Cytisus laburnum</i> ..	Laburnum	Europe.
<i>Phormium tenax</i> (E) ..	..	Flax	New Zealand.
<i>Picea excelsa</i> (E) ..	<i>Abies excelsa</i>	Norway spruce	Europe.
" <i>sitchensis</i> (E) ..	" <i>Menziesii</i> ..	Tideland spruce	Alaska, Northern Canada.
" <i>Canadensis</i> (E) ..	..	White-spruce	North-east United States.
<i>Pinus Austriaca</i> (E) ..	..	Austrian pine	Southern Europe.
" <i>Canariensis</i> (E) ..	..	Canary pine	Canary Islands.
" <i>contorta</i> (E) ..	<i>Pinus Murrayana</i> , <i>Pinus Bolanderi</i>	Twisted pine	Alaska to California.
" <i>Coulterii</i> (E) ..	<i>Pinus macrocarpa</i> ..	Great-coned pine	California.
" <i>excelsa</i> (E) ..	" <i>pendula</i>	Himalayan pine	Himalayan Mountains.
" <i>flexilis</i> (E) ..	..	Limber pine	Rocky Mountains, Sierra Nevada.
" <i>halensis</i> (E) ..	..	Aleppo pine	Levant.
" <i>Lambertiana</i> (E) ..	..	Sugar-pine	Northern California, Oregon.
" <i>Laricio</i> (E) ..	..	Corsican pine	Southern Europe.
" <i>muricata</i> (E) ..	..	Prickly-coned or Bishop's pine	California.
" <i>ponderosa</i> (E) ..	..	Heavy or bull pine	North-west America.
" <i>ponderosa</i> , var. <i>Benthamiana</i> (E)	..	Bentham's yellow-pine ..	British Columbia.
<i>Pinus pinaster</i> (E) ..	<i>Pinus maritima</i> ..	Cluster-pine	Southern Europe.
" <i>radiata</i> (E) ..	" <i>insignis</i>	Monterey pine	California.
" <i>rigida</i> (E) ..	..	Pitch-pine	New England to Virginia.
" <i>Sabiniana</i> (E) ..	..	Nut-pine	California.
" <i>strobus</i> (E) ..	..	Weymouth pine	North America.
<i>Piptanthus Nepalensis</i> (E)	..	Evergreen laburnum ..	Himalayas.
<i>Pittosporum crassifolium</i> (E)	..	Karo	New Zealand.
" <i>eugenioides</i> (E) ..	..	Matipo, tarata	"
" <i>tenuifolium</i> (E) ..	..	" <i>tawhiri</i>	"
" <i>Buchananii</i> (E) ..	..	" <i>tawhiwhi</i>	"
<i>Populus deltoides</i> (D) ..	<i>Populus monolifera</i> , <i>Populus Canadensis</i>	Canadian or black Italian poplar	North America.
<i>Populus nigra pyramidalis</i> (D)	<i>Populus dilatata</i> , <i>Populus fastigata</i>	Lombardy poplar	Europe and Northern Asia.
<i>Podocarpus dacrydioides</i> (E)	..	Kahikatea	New Zealand.
" <i>totara</i> (E) ..	<i>Nageia totara</i>	Totara	"
" <i>Hallii</i> (E) ..	" <i>Hallii</i>	Large-leaved totara ..	"
<i>Pseudo-tsuga taxifolia</i> (E) ..	<i>Abies Douglasii</i> ..	Oregon pine	British Columbia, Pacific Coast, &c.
<i>Pyrus aucuparia</i> (D) ..	<i>Sorbus aucuparia</i> ..	Rowan-tree, mountain-ash ..	Europe and Asia.
<i>Quercus coccinea</i> (D) ..	..	Scarlet oak	Eastern North America.
" <i>macrocarpa</i> (D) ..	..	Burr oak	"
" <i>pedunculata</i> (D) ..	<i>Quercus robur</i>	British oak	Europe and West Asia.
" <i>palustris</i> (D) ..	..	Pin-oak	South-east of North America.
" <i>suber</i> (D) ..	..	Cork-oak	Southern Europe.
<i>Robinia pseudo acacia</i> (D) ..	..	Black locust or false acacia	Pennsylvania Mountains.
<i>Salix Caprea</i> (D) ..	..	Goat willow	Europe (Britain).
" <i>viminalis</i> (D) ..	<i>Salix longifolia</i> ..	Common osier	"
" <i>vitellina</i> (D) ..	..	Golden osier	Britain.
<i>Sequoia sempervirens</i> (E) ..	<i>Taxodium sempervirens</i>	Redwood	California.
<i>Sophora tetraptera</i> (E) or (D)	<i>Edwardsia microphylla</i>	Kowhai	New Zealand.
<i>Vitex lucens</i> (E) ..	..	Puriri	North New Zealand.

Approximate Cost of Paper.—Preparation, not given; printing (1,600 copies), £70 10s. 6d.

By Authority: JOHN MACKAY, Government Printer, Wellington.—1909.

Price 1s. 6d.]