1924.

NEW ZEALAND.

STATE FOREST SERVICE.

ANNUAL REPORT OF THE DIRECTOR OF FORESTRY FOR THE YEAR ENDED 31ST MARCH, 1924.

Presented to both Houses of the General Assembly pursuant to Section 64 of the Forests Act, 1921–22.

The DIRECTOR OF FORESTRY to the Hon. the COMMISSIONER OF STATE FORESTS.

SIR,— Wellington, 1st June, 1924.

I have the honour to submit herewith a report on the work of the State Forest Service for the year ended 31st March, 1924.

The following recommendations are submitted for your consideration :—

(1.) The national forest policy and programme should be carefully reviewed during the coming year and reoriented in the light of the developments of the past four years. This recommendation is in line with the proposals of the 1920 report.

(2.) The establishment of a special State Forests Account of £500,000 to be used for the acquisition of forests and the consolidation of permanent State forests.

(3.) There are still large areas of Crown-owned forests undedicated to forest-conservation, protection of stream-flow, and general timber-crop production. The Forest Service should be made responsible for these forests, their conservation and appropriate use.

(4.) Financial assistance to a recognized school of forestry is advised. Trained foresters are sorely needed.

(5.) The time is now ripe for the establishment on a modest scale of a forest-products laboratory where research and study of wood problems, timber-seasoning, and development of uses for our annual wastage of 8,000,000 tons of wood can be carried out.

(6.) The adequate control of deer calls for early concerted action. Present measures have not proven altogether effective.

(7.) Recommendations "B," "C," "G," of the 1923 annual report, which deal with Crown forest administration, North Island Experiment Station, and policy of administering sawmill tramways, respectively, are again submitted for your consideration.

I have, &c.,

L. MACINTOSH ELLIS, B.Sc.F., C.S.F.E., S.A.F.,
Director of Forestry.

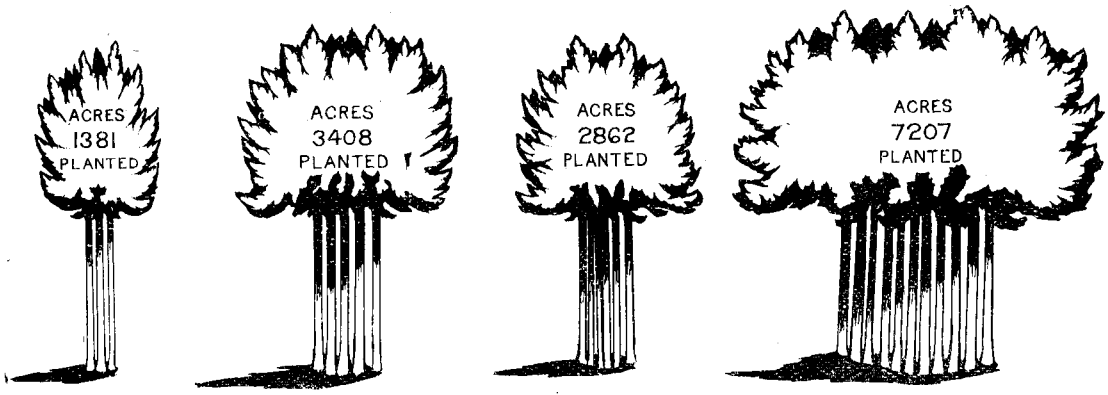
CONTENTS.

CHAPTER I.—PROGRESS.

The year just closed has been another record year in profitable forestry operation in the Dominion. The total forest income from all sources—sales of trees, timber income, grazing, and minor uses—was £93,479, whilst the total operational, protective, and general management expenses were £42,584 (a distributed charge of only 1½d. per acre), leaving a balance of £50,895, which was applied to the capital investment of State forest plantations throughout the Dominion and to their maintenance, protection, and improvement.

Afforestation.

During the year 7,207 acres of new plantations were established in the Rotorua, Hanmer Springs, Balmoral, Tapanui, and Westland districts, as compared with 2,862 acres established in 1922–23, 3,408 acres in 1921–22, and 1,381 acres in 1920–21. This result is indeed encouraging, particularly when it is remembered that this new acreage of 7,207 acres was formed at a cost of not more than one-half the unit costs of those of former years. The total area of State plantations now in New Zealand embraces 51,825 acres.



Comparison of the Annual Tree-planting Operations in State Plantations for the Years 1921–24.

A successful beginning in direct afforestation operations in the cut-over bush lands of the Westland Province was made during the year. The planting of the first 140 acres near Hokitika has been primarily successful and augurs well for the future.

The total quantity of trees for planting disposed of to settlers, returned-soldier farmers, runholders, local bodies, and others was 1,840,000, which constitutes another record in our history.

Forest-protection.

The forest-fire season of 1923–24 put to a severe test the forest-fire-prevention machinery of the Service, but it is reported that the total number of fires doing damage to timber in State forests was thirty-three, embracing a timbered area of 45 acres. A large proportion of the damage of £292 is being salvaged by prompt cutting. This small loss during a year of unusual dryness and high hazard speaks well for the high degree of support and co-operation that the Service is now securing from the public of this Dominion in its efforts to conserve the national forest resources.

Timber-sales.

Another high-water mark has been set during the year in the many advantageous sales of ripe timber made for immediate and local use to State Departments, sawmillers, sleeper-getters, farmers, and others. £266,388 worth of ripe timber was sold on competitive terms in quantities from a few hundred feet up to several million feet. Special consideration was given, as usual, to assisting co-operative sawmilling groups and in making it possible for the small operator to secure raw material on such terms as would permit him to compete successfully in the manufacturing and marketing of his timber.

Forest-products Research.

In forest-products research substantial progress was made in determining the use values of red-beech and black-beech for building and general industrial purposes; whilst standard service tests were begun at Auckland University College on New-Zealand-manufactured plywoods and veneers. The cross-arm tests begun in 1922 were continued on southern rata, and on certain Australian woods for comparison purposes. Pole tests on silver-pine, kawaka, and on certain exotic timbers were continued during the year. Findings of investigations were published in Circular No. 10, and an investigation dealing with the average working-values in specific gravity and shrinkage of our native woods was started during the year. An important study of sap-stain and its prevention in white-pine was begun during the year. This is a most important economic study, as it has been found that a certain mould reported to occur in New Zealand butter is traceable to a sap-stain fungus. The tannin value of kamahi was undertaken in conjunction with the Woolston Tanneries (Limited), and a preliminary study dealing with kauri-gum bleeding was inaugurated. Certain other minor investigations were undertaken, such as—the use of New Zealand woods for brush-backs; for making of bobbins, perns, and spools; tanakaha for deep-sea fishing-rods; and the use of beech in milk-crates.

Private and Local-body Forestry.

The year marks the fixing of a new high-water mark in private, proprietary, and local-body afforestation activities. At least three sawmilling companies have pledged themselves to definite projects, ultimately involving at least 7,000 acres; whilst the sum total of new private plantations and shelter-belts established by farmers, settlers, and runholders during the year is 5,000 acres. A prominent feature of the year was the launching and formation of at least twelve plantation companies organized for the chief purpose of planting and growing timber crops. The establishment of at least 50,000 acres of commercial tree-plantations should result. For the year about 500 acres were formed by this agency. Other industrial proprietary and co-operative enterprises were responsible for the

planting of 500 acres, whilst 1,500 acres of artificial forests were created by boroughs and county bodies. Other State Departments were responsible for the planting of 200 acres.

The grand total acreage of plantations established during the year, including the State plantations, was 15,000 acres.

Area of State Forests.

A substantial and essential addition of 97,170 acres of Crown forest lands was made to the National Forest Domain during the year. The total domain is now 7,433,181 acres, or 11·2 per cent. of the total area of the Dominion.

General.

The increasing importance of the opossum as a by-product of the forest is emphasized this year when it is noted that 109,905 skins, valued at £46,563, were trapped. At least ninety thousand of these skins were secured in State forests. Bounties were paid on 4,781 wild pigs destroyed in the Whangamomona district. A start was made in reducing the vermin deer in certain unprotected areas in Canterbury, Westland, Nelson, and other centres, but the real value of this system of control will not be seen for some time.

Progress has also been effected by the Service in establishing its own seed collection and extraction machinery; in effecting substantial economies in tree propagation and plantation formation costs; and in widening general interest in forestry throughout the Dominion.

A valuable perspective on the relative value of the present New Zealand forest policy as compared with Australia, Canada, and other parts of the Empire was secured by the Director of Forestry as a result of his attendance at the British Empire Forestry Conference held in Canada last year. (A brief abstract of the resolutions passed at this Conference and notes thereon are contained in Annexure VI.) He is of the opinion that in achievement and progress New Zealand has much to be proud of, yet it is true that she has a long way to go to assure her national forest objectives. Three problems are clearly revealed. They are timber-supply, land use, and stream-flow conservation.

The time will soon be ripe for a complete recasting of our national forest policy in the light of the knowledge and experience gained as a result of the investigations and developments of the last four years. Our Dominion-wide Forest Inventory shows the timber resources of the country, their distribution and volume—we know fairly accurately what lands may be permanently dedicated to timber-crop production; our national growth can be gauged, and we know what may be secured from planted forests.

The Service must now consider the problem of formulating a permanent and lasting forest programme, and in a few months it must express a definite, exact, and practical plan upon which can be built our national forest policy for all time. A programme of reasoned use which will ensure to New Zealand her national safety in plentiful wood-supplies, in continuity of water-flow, and in the widest and greatest use of our forest lands and resources.

CHAPTER II.—THE STATE FOREST SERVICE.

The members of the Service during the year 1923–24 have given efficient, loyal, honest, and intelligent service to their many increased responsibilities and duties of forestry. The total number of permanent officers was 96, as compared with 97 in 1921, yet the volume of business for the year just closed was ten times that of the former period. Only four changes in the staff by resignation took place during the year. The spirit of genuine co-operation and team play that prevails enabled the Service to cope with the many new problems that have arisen, for in addition to carrying on forest surveys, timber cruises, forest-fire patrols, trespass, opossum-control, collection of silvical material and timber-testing material, the forest officers of the Service act as Scenic Reserve Inspectors, rangers under the Animals and Birds Protection Acts, and many other associated activities.

The work of the Service is now seriously handicapped through lack of trained men: the setting-up of a departmental periodic school of instruction and the recognition of a properly equipped School of Forestry at one of the University colleges are urgently required and should be proceeded with. Forest officer trainees to the number of thirteen were recruited to the Service, and it is hoped to increase this number as suitable candidates appear. The following schedule illustrates the distribution of the permanent staff:—

New Zealand State Forest Service Organization.—Distribution of Permanent Staff as at 31st March, 1924.

Forest-conservation Region.	Director.	Secretary.	Chief Inspector.	Conservator of Forests.	Special Officers.	Forest Assistant.	Surveyor.	Clerical Staff.	Draftsmen.	Forest Rangers, A Grade.	Forest Rangers, B Grade	Forest Guards.	Nurserymen.	Others.	Total Number as at 31st March, 1924.
Auckland	..	..	..	1	..	..	..	1	..	1	3	..	..	..	6
Rotorua	..	..	..	1	..	..	..	3	..	2	6	6	1	1	20
Wellington	..	..	..	..	..	..	..	1	..	3	2	1	..	..	7
Nelson	..	..	..	..	..	..	..	1	..	1	4	1	..	..	7
Westland	..	..	..	1	..	..	..	1	..	1	3	..	..	..	6
Canterbury-Otago ..	..	..	..	1	..	..	..	3	..	3	6	3	3	..	19
Southland	..	..	..	1	..	..	..	1	..	1	3	..	..	..	6
Central Office	1	1	1	..	2	1	1	12	5	..	1	..	..	..	25
Total	1	1	1	5	2	1	1	23	5	12	28	11	4	1	96

CHAPTER III.—THE STATE FORESTS.

1. CONSTITUTION OF STATE FORESTS.

At the close of the year the area of permanent State forests stood at 1,674,844 acres, the area of provisional State forests at 5,661,830 acres, and the area of forest reserves at 96,507 acres—a grand total of 7,433,181 acres, as against 7,315,706 acres in 1923. The wide disproportion between permanent State forests and provisional State forests must be corrected, for it is evident that at least 5,000,000 acres of provisional areas comprise lands chiefly valuable for forestry and not for agriculture and settlement. In relation to the area of forest lands now dedicated to timber-crop production and to protection of stream-flow, it is interesting to note that the total unimproved occupied land of the Dominion has decreased by 232,629 acres from the year 1919–20 to the year 1922–23; whilst the total increase in the acreage of unimproved occupied land which has reverted to fern, scrub, and second growth has increased by 230,708 acres during the same period (from statistics of New Zealand). The total area of barren and unproductive land indicated for the year 1922–23 is 1,952,714 acres, and of fern, scrub, and second-growth land is 3,953,075 acres, making a grand total of 5,905,789 acres—really a serious burden and a dead-weight on the regions in which they have accumulated. The residual nationally owned forests of the Dominion must therefore be sacredly conserved for our present and future needs, for every acre of forest land will be required. Substitutes and economies in utilization will only partially offset the normal increase in demand as population increases.

FOREST RECONNAISSANCE, SURVEY, AND INVENTORY.

The National Forest Stock-taking Inventory was completed during the year, and is now ready for printing and circulation. This valuable document furnishes the fundamental basis of indigenous forest stocks available for our Dominion-wide present and future needs, and upon it will now be built the permanent programme of action for forestry in New Zealand. The report deals in a comprehensive manner with the principal forest types; general description of the forest resources of each region; summary of the timber of the Dominion; silvical information as to the forest-trees —their distribution, range; ownership of forest lands and their classification; volume tables for rimu and general statistical review. The finalized statistics show that New Zealand possesses nearly 39,000,000,000 superficial feet of milling softwoods and 23,000,000,000 superficial feet of hardwoods, a total of 62,000,000,000 superficial feet growing on 12,592,000 acres (State forests comprise 7,433,449 acres). Reconnaissance surveys were made of 446,000 acres of forest lands in the North Auckland Province, Mamaku district; in the Mimi and Waro Survey districts; in the Motuhora, Wairoa, and Mangaweka areas; and in the following South Island regions—Takaka, Aorere, Cobbe, Karamea, Little Wanganui, Brighton, and Okarito. These surveys were undertaken for the purpose of classifying the land and timber types and assessing the forest-values for commercial and protection purposes. These examinations also serve for the development of proper working circles and adequate boundaries. The mileage of boundary-demarcation surveys run was 160 miles. This work has really only been initiated, and is chiefly confined to the delimitation of new afforestation areas and the definition of boundaries where contiguous owners require adjustments.

A survey of 8,231 acres of State plantations at Hanmer Springs was completed and the plan approved by the Chief Surveyor, Lands and Survey Department. The boundaries of 3,221 acres of State plantations in the Rotorua region were also surveyed and the plans put in hand.

CO-OPERATION, TIMBER-STUMPAGE EXAMINATIONS, AND REPORTS FOR OTHER DEPARTMENTS.

The Service has extended during the year its facilities for timber-land examination and forestry generally to several Native Land Boards, the Departments of Lands, Public Works, Mines, Valuation, and to other Departments: 18,043 acres of land in 48 areas have been examined on their account.

2. FINANCE.

The year has been a record one in forest receipts. The total receipts from all sources paid into the State Forests Account were £93,479, of which amount the nurseries and plantations yielded £8,226. The total increase in receipts was 47 per cent. over the previous year and 200 per cent. over the year 1919–20.

The State Forest Service expenditure for the year was as follows:—

ANNUAL STATE FOREST SERVICE EXPENDITURE.

Item.	Fiscal Year ended 31st March, 1924.	Fiscal Year ended 31st March, 1923.
	£	£
A. Salaries	30,686	30,092
B. Management and development of State forests	16,271	13,799
C. Forest-fire prevention and patrol (indigenous forest)	1,977	1,808
D. Education: Reference library, publications, &c.	582	574
E. Forest research and products investigations	3,738	2,224
F. Afforestation: Plantations, nurseries, and general	38,006	35,155
G. Acquisition of indigenous forests	4,548	1,064
H. Grants to local bodies, &c.	2,496	694
	*98,304	85,410

* Includes £2,002 unauthorized expenditure.

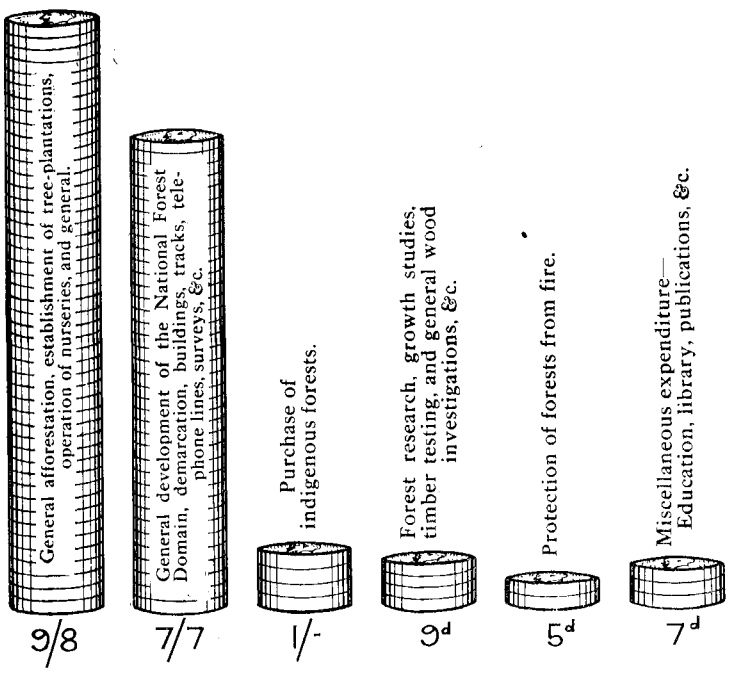
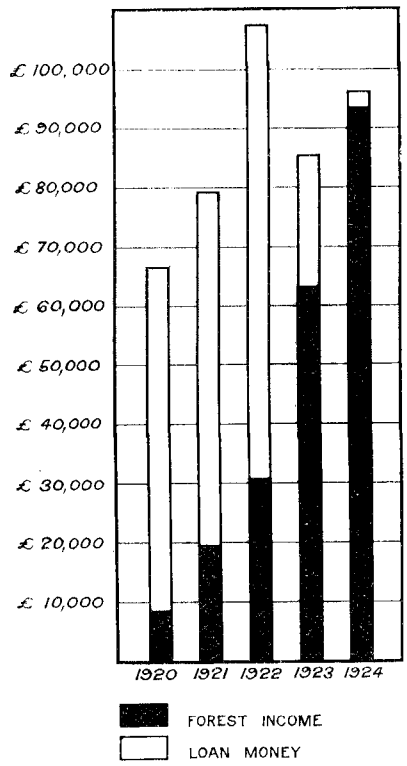


DIAGRAM SHOWING THE APPORTIONMENT OF EACH £1 OF THE SERVICE EXPENDITURE FOR THE FISCAL YEAR ENDED THE 31ST MARCH, 1924.



FOREST SERVICE EXPENDITURES ARE FINANCED FROM CURRENT FOREST INCOME AND FROM DEBENTURE LOAN-MONEYS.

3. MANAGEMENT.

TIMBER.

The Main Trunk King-country as the principal timber-producing region has reached its zenith; and although the development of the great Tongariro blocks will ensure the maintenance of the dominant producing position of this region for a decade, nevertheless the territory must soon give way to Westland with its unbroken virgin resources of pine and beech. The exhaustion of the white-pine resources of the Main Trunk forests is driving millers far afield, whilst steadily increasing logging and manufacturing costs are inducing more efficient operations and machinery. During the year in this region sixteen mills were cut out, and twelve new mills were built or were in course of construction.

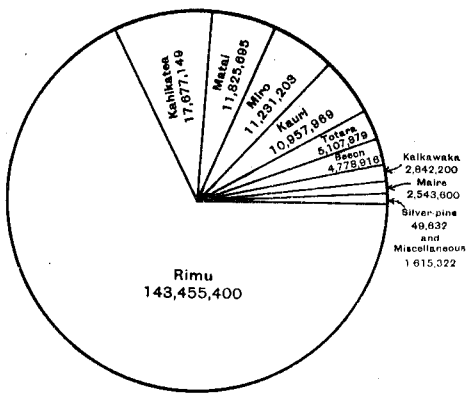
With the impending decline of the King-country as a producer of sawn-timber goods the Mamaku-Rotorua region has become a not unimportant producing centre. New milling-facilities, to the extent of 75,000 superficial feet per diem, were built or building during the year; and the total number of mills now operating in the region is twenty-two, with a production capacity of 52,000,000 superficial feet per annum. The relatively rapid increase in milling in this region has resulted in quite a scramble to secure timber stumpage, with the result that royalty values have appreciated sharply during the year. The Rotorua region can never become, however, a permanent source of timber-supply owing to the rather restricted area of standing timber and to the need for conserving the immature growing forest capital on the State forests therein.

The Westland Province has come prominently forward during the year as the second most important milling region in New Zealand. Its output of nearly 65,000,000 superficial feet constitutes a record (the nearest approach to this output occurring in 1913, when the cut was 62,000,000 superficial feet). Westland will soon assume the lead as the largest timber-producing centre, serving all markets of the Dominion. The opening of the Otira Tunnel, of course, is responsible in a large measure for the greatly improved position in Westland. Since its opening and to the close of the year 17,682,000 superficial feet were railed through to Canterbury. Within three years Westland will probably be producing 100,000,000 superficial feet of sawn-wood goods per annum.

The general widespread demand for sawn timber throughout the Dominion was reflected during the year in greatly increased business in State Forest Service timber-sales of ripe mature merchantable timber from State forests; and more timber was cut from the State forests during the reporting period than ever before in their history. The State Forest Service timber business for the year as compared with that of previous years is as follows:—

Fiscal Year.	Number of Sales.	Value of Timber sold.	Quantity of Timber sold.	Receipts from Timber sold.	Quantity cut from State Forests during the Year.
		£	Sup. Ft.	£	Sup. Ft.
1923–24	61	266,388	212,085,000	68,295	52,297,000
1922–23	52	95,357	78,830,000	47,462	..
1921–22	40	38,208	35,669,000	24,320	..
1920–21	5	17,055	6,987,000	16,815	..

The "live and let live" timber-selling policy of the Service is proving more and more popular with the sawmillers and forest operators throughout the Dominion, for the fair system of selling all offerings by public tender ensures an open field and no favours to all-comers. Many small sales were made to co-operative parties, to hand loggers, and returned-soldier parties under such conditions as would ensure their profitable operations. Every encouragement is given to the smaller millers, for to them must the Service look for assistance in carrying out the policy of sustained timber-crop production. In offering blocks for sale the selections are made, as far as possible, from those lands that are chiefly valuable for settlement and agriculture, so that every available acre may be secured for primary production as soon as possible.



STATISTICS OF THE SERVICE TIMBER-SALES, 1923–24. QUANTITIES SHOWN IN SUPERFICIAL FEET.

The favourable timber-markets of the past year, coupled with a sudden realization that our forest resources in certain regions are fast disappearing, have sent stumpage-prices sharply upward (from which position it is doubtful whether they will ever recede). Indeed, there is no natural resource, in New Zealand or out of it, that is appreciating so steadily as virgin timber, and it must continue to do so until the substitution-point or the forest-production-cost point has been reached. Over a period of a generation in this Dominion stumpage has increased in value at the average rate of from 6 per cent. to 8 per cent. per annum, and will, no doubt, continue to do so for some time to come.

The State is now actively benefiting in the unearned increment of timber-values by virtue of the sales policy of the Service. More adequate funds are now available for reinvestment in the national timber farms, but the greatly increased timber business of the Service is taxing the personnel of the Department to the utmost, and the building-up of a sufficient corps of qualified and experienced sales officers along systematic lines is essential.

FOREST IMPROVEMENTS.

During the year one guard's headquarters, one seed-extraction house, and two patrol huts were erected, and one guard's station rebuilt. Sixteen miles of forest telephone-line were erected. Thirty-seven miles of new tracks were built and forty miles repaired. Lack of funds has prevented more activities in the creation of essential forest improvements.

GRAZING.

Definite investigations in range classification were continued during the year. A comprehensive survey of the grazing resources of the forest reserves in Canterbury–Otago region was undertaken to adjust the revenue from grazing leases and to estimate the value of grazing from which no revenue is being received. Observations made during the survey confirm previous statements that an organized system of grazing with controlled numbers of stock is applicable to forest reserves in very few cases. The reserves with few exceptions are situated within the boundaries of pastoral runs, and, except in a few cases, the configuration of the country prohibits their separation from the runs by fencing. Consequently stock from the runs have free access to the reserves, and it is very difficult to restrict their numbers. Generally speaking, the grazing on the forest reserves is small both in area and carrying-capacity. The study of the economy of the grazing of domestic cattle in State forests is being further investigated with a view to determining the degree of permanent grazing to be allowed.

LAND-CLASSIFICATION.

In conjunction with the Forest Surveyor a reconnaissance of 17,874 acres of forest lands at Ngawaro in the Rotorua region was made. The land was considered unsuitable for settlement and was reported on accordingly. State forests to the extent of 408,289 acres in the Canterbury–Otago region have been under review during the year. These areas, practically without exception, are mountainous and poor in quality, and although the less rugged portions may be economically converted to grazing-lands—as tussock and native grasses naturally replace the forest—the protectional value of the forest areas precludes any question of converting them to pastoral uses. In fact, the aggregated area of forest in the region is inadequate for protectional purposes and should be greatly augmented rather than decreased.

Opossums.

The year has been notable for a great increase in the opossum-trapping industry. During the season a total of 679 licenses were issued, and 109,905 skins were taken, largely from State forests (based on average export valuation for the last twelve months the value of these is estimated at £46,563). The share of licenses and royalties credited to the State Forests Account is £3,309 9s. 5d. There appears to be a growing feeling of antagonism towards the opossum in some quarters, statements being made that it is destined to become a great menace to forests, exotic plantations, orchards, gardens, and native bird-life. While the consensus of opinion, within this Service and among many authorities outside, is that the damage is negligible, it is considered that some of the statements made against the animal are to a certain degree correct, and during the present year it is proposed that a comprehensive survey of the animal will be made.

Recreational Uses of the Forests.

It is only as the community values the forests that the community will demand the proper use and conservation of the forests. It is for that reason the Service has continued to extend the many opportunities for visitors, trampers, fishermen, and hunters to travel through and use the national domain. As finance permits, camping-sites and fireplaces are being built, for property provided for recreational use will add valuable elements to our national life without seriously impairing the capacity of the forests to create wealth or render other public services. The attitude of the Service toward the forest-lovers is being appreciated, for this year the number of visitors resorting to the State forests and plantations for health and pleasure greatly exceeded that of the previous year. Trampers, fishermen, stalkers, and other sportsmen seeking interest and amusement in the State forests are invited to use the facilities of the Forest Service to assist in that end.

Native Bird-life.

Recognizing that "no native birds mean no native forests" and "no native forests mean no native birds," the active support of the Service was given last year to the native-bird-protection movement initiated by Sir Thomas Mackenzie and Captain Sanderson. A society was organized under the name of the New Zealand Native-bird Protection Society, and facilities were established to carry the message of wild-life conservation to the country. It is understood that by poster, leaflet, and precept the school-children are being reached with happy and satisfactory results. The appeal is certainly worthy of citizens' support, for, unfortunately, a most apathetic attitude does prevail in certain regions with regard to this vital issue. Forest officers to the number of thirty-six have been appointed rangers under the Animals Protection and Game Act, 1921–22, and no opportunity is lost to drive home the need for the perpetuation of our birds.

Honorary Forest Rangers.

The number of citizens who have associated themselves with the operation of the national forest policy as honorary forest rangers increased by twenty, making a total of fifty-six honorary officers of the Department.

The Service wishes to express its appreciation and gratitute to this corps of voluntary workers in the cause of forestry. During the dangerous forest-fire season of 1923, without exception the heartiest support and co-operation were given by them to the paid officers of the Service in the suppression and prevention of fire, and in a measure the small loss was due to their assistance.

In conserving and protecting the bird and other wild life of the forests the help of many honorary rangers has been substantial as well as in guarding the forests against other enemies. It has been found that the success of forestry in its many branches depends in a large measure on the active sympathy, support, and appreciation of the members of the community. It is in helping in the dissemination of forest knowledge and inculcating a better forest consciousness that the honorary officers of the Department have also rendered such valuable service to the common weal. It is proposed to secure the appointment of many more citizens in this corps.

Forest-protection.

The fire season, 1st November, 1923, to 31st March, 1924, was a dry one throughout the Dominion, especially so during the months of December, January, and February, when the fire-danger was at its highest.

Thirty-three fires occurred on lands under the jurisdiction of the Forest Service, destroying the growth on 1,318 acres, of which 45 acres carried timber, 374 acres comprised cut-over lands, and 899 acres comprised fern and scrub land. During the year 0·7 acre of exotic plantations was also burned, but the timely action of the patrol staff prevented a serious conflagration. The total value destroyed on State forests amounted to £292 15s. The majority of the fires originated from settlers burning off, and from "unknown causes."

Six new fire districts were proclaimed during the year, making the total number of fire districts at present in operation nineteen.

ANALYSIS OF ALL REPORTED FOREST-FIRES ON AND CONTIGUOUS TO STATE FORESTS.

Forest-conservation Region.	Forest-fires: Number, Character, and Area.										Money Value of Forest-wealth destroyed.					
	Number detected.		Timber Land burned. (Acres.)		Cut-over Land burned. (Acres.)		Scrub Land burned. (Acres.)		Total Area burned over. (Acres.)		Merchantable Timber.		Valuable Regrowth.		Total Value.	
	S.F.	Priv.	S.F.	Priv.	S.F.	Priv.	S.F.	Priv.	S.F.	Priv.	S.F. £	Priv. £	S.F. £	Priv. £	S.F. £	Priv. £
Auckland ..	4	..	..	1,530	34	1,170	5	3,127	39	5,827	..	1,019	..	..	..	1,013
Rotorua ..	1	2	3·5	327	..	3,296	35·5	7,273	39	10,896	7½	537½	..	25	7½	562½
Wellington	2	6	5	..	66	13,670	460	16,313	531	29,983	10	600	62½	463½	72½	1,063½
Nelson-Marlborough	5	11	1·5	792	..	4,560	248·5	7,190	250·2	12,540	1¼	258	1	..	2¼	258
Westland ..	5	..	..	..	114	25	..	..	114	25	..	..	..	..	..	..
Canterbury-Otago	4	3	20	100	..	..	150	..	170·5	137*	20	100	..	..	20	100
Southland	4	2	15	30	160	866	..	..	175	896	170	900	..	..	170	900
Totals	25	24	45	2,779	374	23,587	899	33,903	1,318	60,304	209¼	3,408½	63½	488½	272¾	3,897

Forest-conservation Region.	Cost of Protection, Prevention, Detection, and Control of State Forests.												Origin of Forest-fires.							
	Fire Patrol Force. (No. of Men.)		Wages Cost.			Fire Equipment Cost.			Locomotion Cost.			Total Cost.				Sawmilling Operators.		Travellers, Trappers, Sportsmen.		Land-clearing Operators.		Unknown Agencies.	
			£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.		S.F.	Priv.	S.F.	Priv.	S.F.	Priv.	S.F.	Priv.
Auckland	7	Period of Employment: November to March.	744	19	1	..			81	0	0	825	19	1		1	3	..	..	..	93	3	12
Rotorua ..	13		1,308	9	7	101	9	2	77	0	6	1,460	13	4†		..	2	..	1	..	44	1	128
Wellington	4		154	9	8	..			59	1	8	213	11	4		1	8	..	2	5	145	1	4
Nelson-Marlborough	8		187	15	5	..			103	10	2	291	5	7		..	..	1	..	2	141	2	10
Westland ..	4		81	13	8	..			29	2	9	110	16	5		..	..	1	..	..	2	4	..
Canterbury-Otago	13		493	19	7	..			16	6	6	510	6	1		..	..	..	..	1	..	3	1
Southland ..	1		84	7	8	..			30	14	7	115	2	3		4	..	..	..	3	18	..	2
Totals	50	..	3,055	14	8	101	9	2	396	16	2	3,528	17	5		6	13	2	3	11	443	14	157

* The numbers include all fires reported whether in State forest or not. † Includes £75 3s. 3d. for labour.

OFFENCES UNDER THE FORESTS ACT AND REGULATIONS.

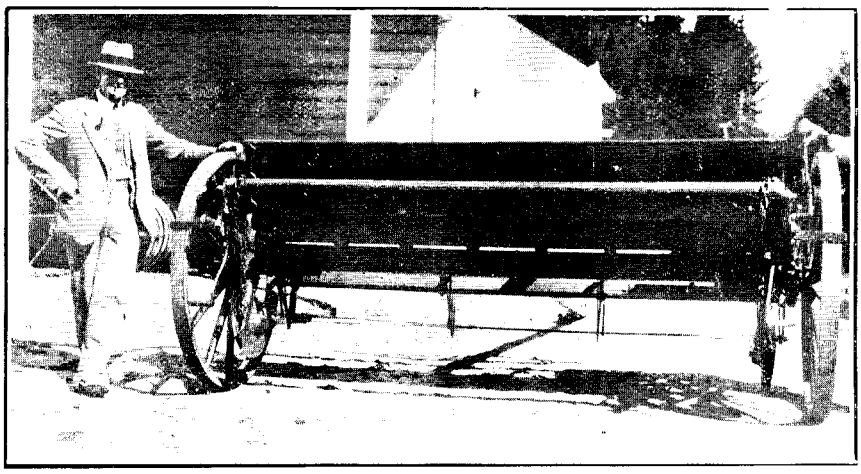
Four prosecutions against offenders were instituted during the year and convictions secured in each case. One conviction was for a small timber trespass, two for illicit kauri-gum digging, and one for lighting a fire without a permit in a forest-fire district.

WILD PIGS AND GOATS.

The Departments of Lands, Agriculture, and the Forest Service joined financial forces last year to make a beginning at reducing the number of wild pigs in the Whangamomona County (Taranaki Province). As a result of this contribution the Service undertook the operation of the campaign, and through the payment of 1s. per snout to the local settlers 4,781 pigs were destroyed. It is recognized that this assistance is helpful in assisting the farmers of the region to deal with this pest, and it is proposed to considerably extend the grant in order to deal with other badly infested areas. In other forest areas—*e.g.*, in the Orongorongo—goats have become well established and are doing definite and serious damage to the vegetation of this attractive recreational and protection forest. With a view to decimating this vermin permits to carry firearms in the forest were granted for this reserve, and it is hoped that by this means the number of goats in this popular Wellington rendezvous will be appreciably lessened.

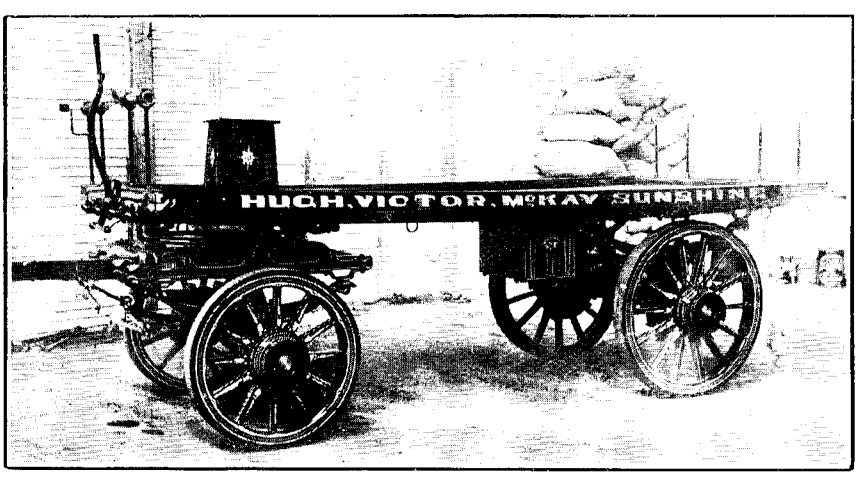
DEER.

Subsequent to the conference of representatives of Government Departments and acclimatization societies, held in Wellington on the 11th April, 1923, to consider the question of deer-control, district officers of the Departments of Agriculture and Lands were interviewed, and with their assistance areas in which it was considered deer were too numerous were demarcated. Maps showing these areas were then prepared, and where possible the acclimatization societies concerned were interviewed, and the proposal to remove protection from the demarcated areas was fully discussed. Subsequently the data were forwarded to the Department of Internal Affairs for action, and in every case protection was removed from the areas recommended. Aggregated, these areas total some 11,250 square miles. Following the recommendation of the Department of Internal Affairs, a subsidy of £1,000, to be paid as a bonus on deer destroyed, was voted by Cabinet and distributed among acclimatization districts on a *pro rata* basis, according to the number of deer estimated by the Forest Service to be in each district. The effect which the removal of protection and payment of a bonus will have in reducing the deer is as yet too early to state in figures, but the general opinion among landholders in the districts recently visited is that the depredations will be greatly alleviated and much good will result.



Seed drill used for Experimental Direct Sowing in Plantations, Kaingaroa Plains.

Officers attending 1921 Annual Conference, Hanmer Springs.



An Australian-made Wagon, Nine tenths of which is constructed of New Zealand Silver-beech (Nothofagus Menziesii).

[*To face p. 8.*

It is pleasing to note that acclimatization societies are in most cases doing their best to cope with the situation and are carrying out extensive culling operations. Much more remains to be done, however, before the menace of the deer can be said to be safely under control. The Service will continue to co-operate closely with the various controlling authorities to effect this end.

4. AFFORESTATION AND FOREST-EXTENSION.

The year 1923 marks the record year in the area of new State plantations formed in New Zealand, and perhaps in any other country in any one year. Including the experimental planting, 7,207 acres were planted with 5,035,457 trees. The greater proportion of the area established was formed at a cost of £1 13s. 7d. per acre, as against a cost of £4 5s. for planting for the previous year. In standard of practice, in cost, and in results the afforestation standards now in use by this Service in comparison with other countries will be found to be satisfactory. The Service is now in a position to carry out an annual planting programme of 20,000 acres yearly on a real efficient basis. If the annual national deficit in our wood requirements is to be made up this must come.

SUMMARY OF OPERATIONS ON STATE PLANTATIONS DURING THE YEAR ENDED 31ST MARCH, 1924.

Forest Plantation.	Number of Trees planted.	New Area planted.	Total Area planted in Trees, 1896–1924.
		Acres.	Acres.
Whakarewarewa*	..	..	8,037·00
Waiotapu*†	..	..	7,010·00
Kaingaroa Plantation†	3,931,415	5,614·00	20,590·00
Puhipuhi	..	..	1,200·00
Conical Hills	7,000	..	3,533·50
Pukerau	23,975	7·25	572·75
Dusky Hill	..	..	745·75
Greenvale	323,600	340·00	2,050·75
Gimmerburn	..	..	88·00
Naseby	183,500	67·00	2,217·75
Hanmer Springs	339,215	498·75	3,412·25
Balmoral	398,445	540·00	1,796·50
Raincliff	..	..	206·00
Westland Forest Experiment Station ..	85,250	140·00	140·00
Experimental group‡	..	..	224·00
Totals	5,292,400	7,207	51,824·25

* Discrepancies with areas shown in previous reports were discovered during a survey made in 1922–23. † Kaingaroa West and Kaingaroa Plains Plantations have been amalgamated as "Kaingaroa Plantation," and a portion of the Waiotapu Plantation has now been included in Kaingaroa Plantation. ‡ Te Kapo Plantation (29 acres) vested in Mackenzie County Council.

In connection with the nursery propagation practice of the Service the following extract from the Official Report of the Seventeenth Annual Meeting of the New Zealand Association of Nurserymen, held at Palmerston North, 16th and 17th January, 1924, may be of interest: "It is a generally accepted fact that Government interference in business is both wasteful and inefficient. This has been proved the world over, and especially since the war. To quote a trite saying, the more business we can put into the Government, and the less Government we have in business, the better for the nation. In New Zealand the State Forest Service is successfully competing with private nurserymen in the sale of forest-trees. It has been asserted that the State can afford to, and do, sell trees below cost. Responsible officers assure us this is not so; they pay the same wages as we do, and the retail side of the Service is a profitable business. I consider it the gravest indictment that can be levelled against any business to say that a Government Department is successfully competing with it on level terms; it says very little for the efficiency of the business." (Extract from a paper read by Mr. Kingsland, forest-tree nurseryman, of Wakefield, Nelson.)

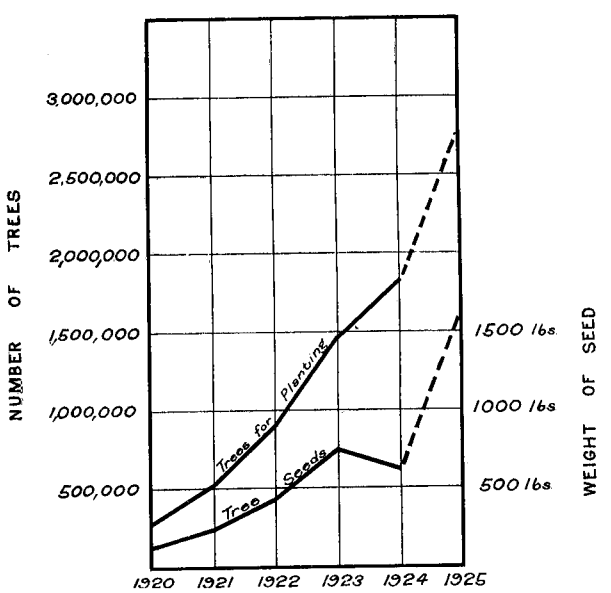
FOREST-EXTENSION.

The reporting year has set a new record in the areas of tree-plantations, wind-breaks, shelter-belts, and wood lots established by interests other than the State. It is now nationally accepted that "To plant trees and grow money" is good business. The Service has given its services freely and without stint to effect this end. The tree and seed sales for the year indicate only a portion of the trees used, for other sources of supply have been from commercial nurseries and from privately owned gardens.

Tree and tree-seed disposals to farmers, settlers, local bodies, proprietary and co-operative companies, &c., from State nurseries are exposed as follows :—

1919 TO 1924.

Year.	Trees for planting. (Number.)	Forest-tree Seeds. (Pounds in Weight.)
1924	1,839,512	618
1923	1,475,581	746
1922	897,552	436
1921	520,702	240
1920	277,235	130
1919	420,412	132



GRAPH SHOWING STATE FOREST SERVICE SALES OF TREES AND SEEDS, PERIOD 1920–25.

CHAPTER IV.—RESEARCH AND EXPERIMENTS.

"The object of New Zealand's national forest policy is to perpetuate the production of forest products in quantities necessary to meet the requirements of the Dominion."

The various forest investigations of the Service are being carried out in order that we may develop the technical processes by which this policy can be effected most efficiently and expeditiously. The following investigations were in progress during the year :—

1. FOREST MANAGEMENT.

SILVICAL RESEARCH.

Beech Forests.

During the past year Dr. L. Cockayne, F.R.S., &c., Service honorary botanist, continued his investigation in the beech (*Nothofagus*) forests, and those grading into taxad rain forest, in the following localities : (1) Westland and north-west Nelson ; (2) Marlborough and north-west Nelson from the Sounds to Nelson City ; (3) the neighbourhood of Lake Wakatipu from Queenstown to the Dart Valley, ascending to 4,000 ft. on Mount Earnslaw ; (4) many areas in Southland, including a journey from Lake Manapouri to Doubtful Sound ; (5) the base of Ruapehu and the Waimarino Plain ; (6) the Mamaku Plateau and the Urewera country to 3,000 ft. on the Huirau Range.

Dr. Cockayne, in an interim report, states : "I am persuaded more than ever that in the *Nothofagus* forests and the *Nothofagus*-taxad forests New Zealand possesses perhaps, so far as the indigenous forests go, her most valuable forest asset, since they will regenerate after milling in nearly all localities, while the growth of the trees is fairly rapid and the timber of great value for many purposes ; further, they generally occupy ground which cannot reasonably be demanded for agriculture." This study will be completed during the year 1924–25.

The Taxad Rain Forests of Westland.

Mr. C. E. Foweraker, M.A., F.L.S., Lecturer in Forestry, Canterbury University College, continued his investigations in the Westland taxad forests during the year. His work was confined mainly to the silver-pine area of South Westland, for these areas are more extensive than was formerly supposed, practically pure stands existing in certain localities. The fact that the rimu is dying out where

silver-pine is densest seems to suggest that silver-pine is a succession forest following on rimu. Further observations were made in the totara and kahikatea areas, the data concerning these stands being now practically complete. Kahikatea dies out when silted up, but totara responds by the putting forth of fresh tiers of roots. Further, totara has great powers of vegetative growth when uprooted and silted up, being the only taxad so far observed to do this. Special observations were made in logged areas where second growth of tree-ferns was abundant. This valuable research will be completed during the current year.

The Growth and Structure of New Zealand Taxads.

Under the direction of Professor Charles Chilton, M.A., D.Sc., of Canterbury University College, two subsidized studies have been undertaken at Canterbury College. One study has to do with the conditions necessary for the germination of rimu, totara, silver-pine, white-pine, matai, and miro seeds, and for the development of the resulting seedlings. Rate-of-growth studies of the native trees have been handicapped owing to the lack of information regarding the number of growth-rings formed per annum. The second study embraces a microscopical examination of wood structure of trees of known age. A number of growing trees have also been placed under observation. This research will be continued.

Kauri and Northern Forests.

This study was continued during the year by Mr. W. R. McGregor, M.Sc., of Auckland University College. Definitive recommendations as to the silvical needs and minimum silvicultural requirements of these forest types will be finalized during this year.

Silvicultural Researches.

Westland Forest Experiment Station.

Good progress was made during the year on this station. An experimental planting on 140 acres of cut-over-slash-burn country was made with 85,250 trees, consisting of Douglas fir, *Pinus ponderosa*, *P. radiata*, *P. muricata*, *Thuja plicata*, *Cupressus lusitanica*, *Populus deltoides*, and Norway spruce. An area of 200 acres was rough-cleared for the current year's planting.

A splendid nursery of 73·5 acres was established, a tree-propagating officer installed, 5 acres of ground broken, and active propagation operations begun with a view to raising all the tree stock required in the experimental work. As soon as a silviculturist can be retained, sample thinnings, demonstration plots, felling areas, experiments in selective cutting, tests in natural and artificial reseeding, slash-disposal, and many other studies will be undertaken at this station. Surveys have been made with reference to a similar station in the North Island.

Rangitikei Sand-dune Experiment Station.

A regrettable break in the continuity of the work occurred during the year owing to the death of the supervising officer, but new arrangements were made to carry on the work. Substantial advances were made during the year. Several types of sand-arresting fences were erected and are now being tested, and two miles of fore-dune have been consolidated with marram-grass. An area of 142 acres of marram-grass was planted at a cost of £3 per acre; and a careful study was made of the various methods of planting and espacement with relation to the effect of wind and drift. Spot seed-sowings of *Pinus radiata*, *P. muricata*, *P. pinaster*, *P. Banksiana*, *Alnus glutinosa*, *Cupressus Lawsoniana*, *C. macrocarpa*, and black-wattle were made in suitable localities. The *Pinus radiata* has again demonstrated its versatility. The fencing of the area and the removal of grazing-animals have resulted in a most remarkable development of the native grasses and shrubs.

It is proposed to plant 100 acres in trees during the current year, to establish a 500,000-tree-capacity nursery, and to locate a permanent camp headquarters at Tangimoana.

Rate-of-growth Studies of Indigenous and Exotic Trees.

Periodic studies of the growth conditions were made during the year of the forty-eight sample plots established in the Auckland, Rotorua, Wellington, Nelson-Marlborough, Westland, and Canterbury-Otago regions. These studies will enable the formation of the felling budgets, a reliable forecast of yield, and ensure the formation of authoritative forest working plans. These investigations will be continued for several years. A start was made on the preparation of yield tables of the more important indigenous timbers, such as kauri, totara, matai, rimu, miro, tawa, and beech. This work is in progress.

Volume Tables for Rimu.

The central North Island table for rimu was completed, anf this table, together with the rimu volume table for Southland and Westland, is now available for public distribution. The use of these tables will be most valuable to those dealing with standing timber.

Mill Conversion Tables for all Milling-timbers.

The collection and compilation of data for these tables was continued during the year in co-operation with the sawmillers of the Dominion.

Underplanting of Exotic Trees in the Indigenous Forest.

The plot established at Mamaku in 1916 was under observation during the year. Preliminary results will be published in the next annual report.

Afforestation Studies.

Co-ordination Investigation.

A comprehensive co-ordination study was begun during the year of the Rotorua Nursery Station and plantations for the purpose of standardizing our technique in tree-propagation and plantation formation, introducing economies where possible, and developing the most efficient practice. A continuous programme of silvicultural-improvement investigations will be established during the current year.

Weed-eradication Experiment.

A study as to the application of zinc sulphate to seed-beds for the eradication of weeds was begun and will be continued.

Tree-propagation Studies.

At the Hanmer Springs Nursery the sowing of the tree-seed in open lines has been developed during the year with certain advantages in stock and cost. The actual labour charge in connection with the raising of over three million trees here was approximately 2d. per thousand. This does not, of course, include subsequent tending charges, nor overhead. As a comparison, the actual figures covering the cost of raising a similar number by the old method works out at approximately 1s. 3d. per thousand. This also is only the actual labour charge of preparation of land and sowing. Scrim coverings and seed-frames are not taken into consideration, but it would practically double this figure The germination in the open-line sowing was about fourteen thousand per pound, and in the latter only seven thousand, so that it would appear that the line sowing has a very considerable advantage over the old roller and seed-frame method. Sowing with the Multiple seed-sower would still further reduce the cost by expediting the sowing, as four or five lines could be sown at a time, instead of the single-line hand-sowing. This work has practically passed the experimental stage, as it was tried on a small scale the previous year. This year's sowing was on a sufficiently large scale to prove its efficiency.

Two-year seed-bed *Pinus ponderosa* is quite far enough advanced at Hamner Springs to transfer to the permanent planting-area, and as a large proportion of the season's planting at Balmoral and Hanmer Plantations was carried out with similar stock with a loss of only 1 per cent., it is emphatically established that we can do away with three-year stock which it has been customary to use in previous years. As a matter of fact, it appears to be better than three-year transplanted stock. *Several advantages stand our prominently* with this system—viz., less handling in the nursery; cheapening of the raising-costs by retaining in nursery for two years only instead of three; one mortality percentage by transferring direct from seed-bed to plantation; the elimination of lining-out and the occupation of less space in the nursery; the liberation of a larger area of land within the nursery for tree-raising purposes. The system cannot perhaps be applied to all species, but it is applicable to the main species being dealt with. As the scope of our afforestation policy expands it becomes necessary to go in for mass production, therefore it will be necessary to adopt wholesale methods, and, if practicable, the methods should be mechanicalized as much as possible.

Autumn Seed-sowing in the Nurseries in the South Island.

An experiment was also tried with the autumn sowing of seed at Hanmer Springs and Tapanui. At the latter station the result was disappointing, but at Hanmer it was successful in virgin soil. The seedlings were well above the ground long before the ordinary spring sowing was commenced, and it is possible that a fair portion of our seed-sowing could be done in the autumn months with advantage. The resulting seedlings in the case of *Pinus radiata* are almost large enough to transfer to permanent quarters in the plantation. In the case of the slower-growing *Pinus ponderosa*, *P. Laricio*, and other similar species, it gives a longer growing-period, and will give a better and sturdier two-year seedling. This matter requires further testing before risking a large sowing.

Plantation-thinning Project.

The loss of volume increment due to very close spacing in the early days of planting can be overcome only by extensive thinning over several thousand acres of plantations at Rotorua, Hanmer Springs, and Tapanui. Preliminary arrangements were made during the year to carry out a profitable experimental thinning at Rotorua. Various cultural rules as to extraction, disposal of slash, and felling have been put into force, and the initial experiment so far has progressed favourably. It is proposed to expand this work considerably during the current year.

Establishment of Plantations by Direct Sowing.

In order to continue the experiments under way at the Kaingaroa Plains Plantation a P. and D. Duncan "Star" drill was specially fitted and adapted to sow tree-seeds in two drills at any distance from 14 in. to 8 ft. in width and in quantities from ½ lb. to 2 lb. per acre.

Early in November, 1923, the following seeds were sown:—

Name.	Amount per Acre.	Total Seed used.	Area covered.
Pseudo-tsuga Douglasii	¾ lb.	27 lb.	36 acres.
Pinus radiata	¾ lb.	52½ lb.	70 ,,
Pinus ponderosa	1 lb.	63 lb.	63 ,,
Totals	..	142½ lb.	169 ,,

The results at the 10th March, 1924, were: *Pseudo-tsuga Douglasii*, 907 trees per acre; *Pinus radiata*, 513 trees per acre; *Pinus ponderosa*, 169 trees per acre. The spacing has in the above trials proved better than in previous sowings with an ordinary grain-drill. This important experiment is to be continued.

2. FOREST-PRODUCTS INVESTIGATIONS.

Comprehensive strength tests of the principal hardwoods, and of all classes of wooden ware, such as spokes, handles, cross-arms, boxes, cooperage, &c., manufactured from hardwoods, have been amongst the investigations carried out by the Forest Service during the reporting period.

One of the most important problems which the Branch of Forest Products must solve in the immediate future is to stimulate the use of hardwoods by demonstrating their use value for industrial purposes. The present normal cutting of timber is 95 per cent. softwoods and only 5 per cent. hardwoods, and the indefinite continuation of such conditions will exhaust the softwood-supplies within a generation. The use of both classes of timber according to their suitability for various purposes should balance up our consumption approximately 75 per cent. softwoods and 25 per cent. hardwoods.

During the year a close study of the building codes used throughout the Dominion was made, and as a result of representations a conference of Government, local authority, and consulting architects, and engineers, builders,. sawmillers, and others, will be held in Wellington early in June to consider ways and means whereby waste of timber in the building industry may be eliminated. An accurate and standardized grading-system is required to remove restrictive regulations drafted to guard against the use of poorly graded timber. A tentative grading rule for structural timbers, based on the scientific limitation of defects, as investigated by the U.S.A. Forest Products Laboratory, has been drafted to give some significance to allowable working-stresses. The Engineering Schools at the Auckland and Canterbury University Colleges will undertake an exhaustive series of tests of native structural timbers for the purpose of finalizing these recommendations.

Approximately 16 per cent. of all the timber consumed is employed in the manufacture of boxes and cooperage. Continued attention was given during the year to the redesign and construction of industrial packages and containers, and several new types of butter-boxes have been investigated. The use of some form of metal strapping offers considerable economy in their construction, saving timber, and yet giving a cheaper and stronger box. It is a certain development of the near future.

A long series of tests of cross-arms and poles commenced in 1922 was continued, and an interim report on the cross-arm tests was circulated during the year.

A valuable contribution to our literature on wood technology was made by Mr. G. A. Garratt, M.F. (now Professor Garratt), who, working under Professor Record (Yale University), the foremost authority on this subject, made a study of twenty-eight of the native timbers and supplied an identification key for eighteen species of hardwoods. This will form a companion work to the identification key for the softwoods, now being prepared by Professor Kirk, of the Victoria University College. Average working values for the specific gravities and shrinkages of the chief commercial timbers have been established. These will be used to standardize sawing dimensions for green timber, and to assist in kiln-drying investigations.

Confirmation of the investigations regarding the successful treatment of eucalypt timbers has been received from California. Experiments so far have been confined to New-Zealand-grown eucalypts, but the work will be extended to include imported species. The success of the investigation now permits of many species of mixed Australian hardwoods being treated and used in place of the more expensive durable woods.

The subject of timber pathology has received considerable attention during the year. With the enthusiastic co-operation of the Agricultural Department, a large number of wood-destroying insects and fungi have been examined, and their destructive works reported upon. A special study of insects introduced into New Zealand by poles, piles, &c., imported from Australia showed that by prohibiting the entry of such timber with bark attached, and by insisting upon the production of a certificate issued by an authorized Government officer of the exporting country that the timber was free from injurious forest and timber insects, fully 90 per cent. of those now entering the Dominion would be eliminated. An investigation of the sap-stain occurring on white-pine and of the methods for its prevention has been carried on at Victoria University College. The work has a twofold significance, as it is suspected that a mould sometimes found on butter may be due to infection from boxes manufactured out of sap-stained white-pine. The work of co-operating institutions and companies, notably the Auckland and Victoria University Colleges, the National Timber Company, Limited (Ngongotaha), H. Baigent (sawmiller, of Nelson), and the Woolston Tanneries (Limited), is gratefully acknowledged. Publication of results in a number of departmental circulars dealing with various aspects of forest-products research was effected and distributed during the year.

Investigations in Forest Economics.

During the year serious attention has been given to the impending reorientation and recasting of the national forest policy which must take place during the current year. Forestry in New Zealand has come to the cross-roads. It must go ahead to its ultimate objective or become a mere bureaucratic organism for the collection of forest revenue. In the 1920 report made to the Government by the Director of Forestry it was stated that "at the end of the first five years of foundation-building a wider and more permanent forest policy must be established." It was for that reason that earnest attention was given during the year to the many social and economic problems bearing on a permanent plan of action—such factors as population-growth, the trend of basic timber-values, probability of substitution, intensification of industrial activity, probable future national needs, and foreign sources of wood-supply. This important investigation will be completed during the current year, and in conjunction with the technical data now in hand will be used in the formulation of New Zealand's permanent forest policy.

There are two outstanding features of the forestry situation in New Zealand.

The first is that within the space of eighty years three-quarters of the virgin forests have been destroyed. The remaining stands are being used up at such a rate that their complete disappearance within another two generations is threatened. (The increase in average mill values (all species) from 6s. 7d. per 100 superficial feet in 1895 to 20s. per 100 superficial feet in 1922 reflects the exhaustion of local forests.)

The second important fact is that in the present exploitation of the forests fully 60 per cent. of the available wood product is destroyed. Economic waste occurs in the bush in the manufacture of timber and in its remanufacture and use.

There is insufficient appreciation of the fact that excessive clearing of the highlands in past years is responsible for the washing into the sea every year of innumerable acres of our best agricultural land, and for the increasing floods, landslips, and other evidences of unstable soil conditions. The lesson is written upon every farm and upon every home in the country. The barren wastes of Spain, Portugal, and Italy can quite easily be reproduced in New Zealand.

Such a happening is unnecessary, for if the forest is regarded as a regularly recurring crop and not as a mine or a wasting asset it may be converted into a source of wealth and profit. This will require the treatment and reclamation of all forest lands to bring them into full bearing productivity, and as far as possible needless waste must be eliminated by more efficient forest exploitation and by reasoned use.

CHAPTER V.- GENERAL.

Report of the Timber Trade for the Year ended 31st March, 1923.

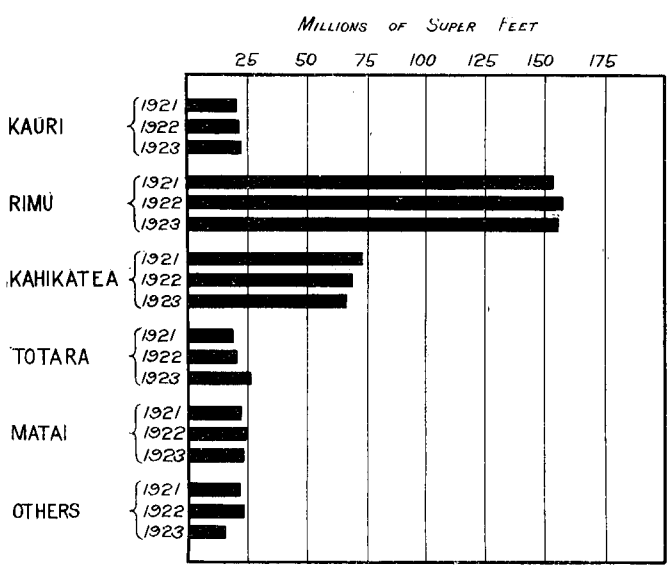
Production.

The following table, showing the reported output in superficial feet of the various species of timber from New Zealand sawmills during the years ended 31st March, 1921, 1922, and 1923, has been compiled from figures supplied by the Government Statistician :—

Reported Production of Sawn Timber by Species.

Species.	1921.		1922.		1923.	
	Sup. Ft.	Per Cent.	Sup. Ft.	Per Cent.	Sup. Ft.	Per Cent.
Kauri	20,393,788	6·63	21,435,728	6·81	22,460,759	7·38
Rimu	153,529,022	49·90	157,345,928	49·96	155,627,936	51·13
White-pine	73,168,750	23·78	68,486,633	21·74	66,088,219	21·72
Totara	17,984,189	5·85	19,570,561	6·21	20,843,718	6·85
Matai	21,329,043	6·93	24,830,368	7·88	23,747,049	7·80
Beech	6,348,594	2·06	4,863,184	1·55	5,227,018	1·72
Pinus radiata ..	9,711,918	3·16	10,815,485	3·43	7,683,602	2·52
Other	5,202,530	1·69	7,624,423	2·42	2,673,576	0·88
Totals ..	307,667,834	100·00	314,972,310	100·00	304,351,877	100·00

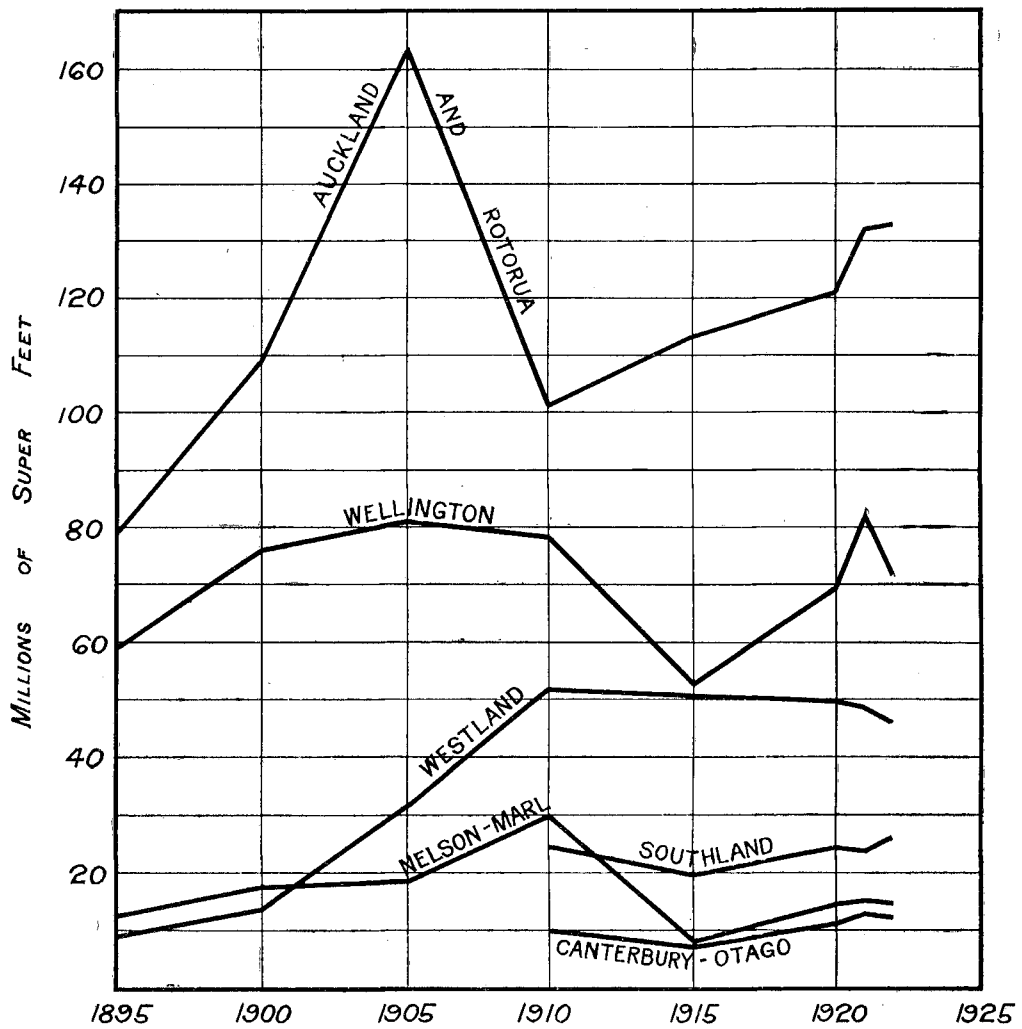
The output for the year ended 31st March, 1924, will be at least 330,000,000 sup. ft.



Graph showing Production of Rough Sawn Timber for Years ended 31st March, 1921, 1922, 1923.

The production for the year ended 31st March, 1923, was 3·5 per cent. lower than for the previous period, due mainly to the decreased exports of rimu and white-pine to Australia. An unprecedented activity in the building and constructional trades, fostered by generous Government advances for housing, is expected to result in a very much increased production of timber for the year ended 31st March, 1924.

A graph has been prepared from figures supplied by the Government Statistician to show the trend of regional timber-production for the period 1895 to 1922. The statistics are compiled for provincial districts, which practically correspond with forest regions. Auckland and Rotorua regions combined, together with Gisborne (*i.e.*, Auckland Province), still occupy the premier position. The relative positions of other regions remain unchanged from the previous year. Westland and Wellington, as the chief exporting regions, show the greatest decrease in production.



GRAPH SHOWING REGIONAL TREND OF PRODUCTION OF ROUGH SAWN TIMBER FOR PERIOD 1895–1922.

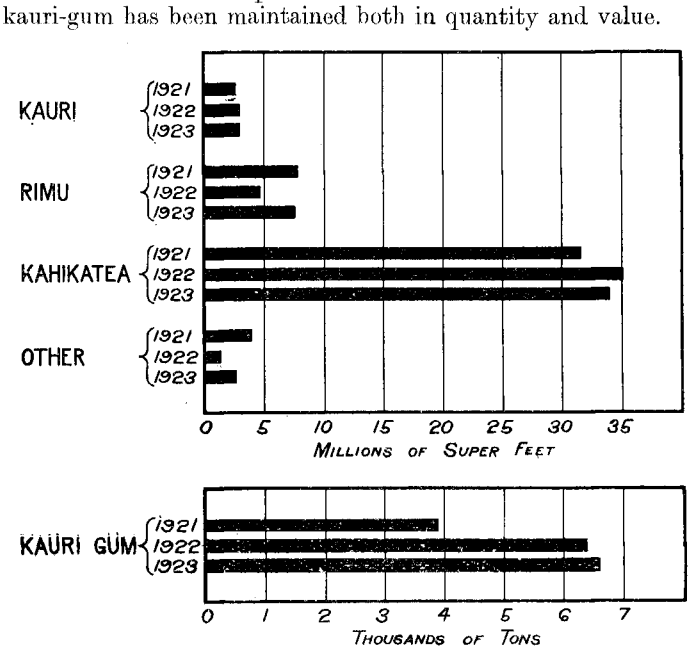
The average mill value (all species) for the year ended 31st March, 1923, was 20s. per 100 superficial feet, compared with 20s. 9d. per 100 superficial feet for the previous period.

Export.

During the year ended 31st December, 1923, 48,093,506 superficial feet of timber were exported, compared with 44,214,499 superficial feet during the previous period, representing an increase of 8·8 per cent. There was a noticeable increase in the shipments of rimu, beech, and "other" (New Zealand) timbers. Australia is absorbing large quantities each year of O.B. matai, which has been a drug on the New Zealand market for some time.

The average f.o.b. value (all species) for 1923 was only 19s. 7d. per 100 superficial feet, compared with 21s. 9d. per 100 superficial feet for the previous year. Kauri was the only species showing an increase in value, which amounted to 1s. per 100 superficial feet. Beech decreased 2s. 8d. per 100 superficial feet in value over the same period.

The export of kauri-gum has been maintained both in quantity and value.



GRAPH SHOWING EXPORTS FOR YEARS ENDED 31ST DECEMBER, 1921–23.

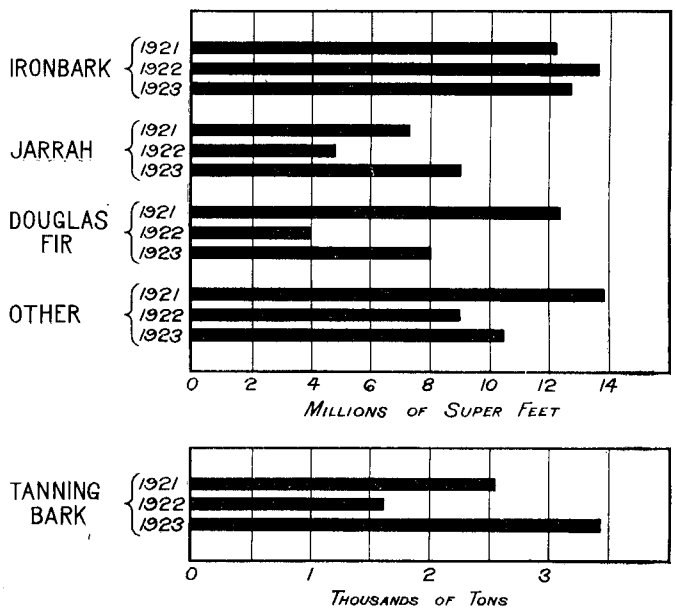
Import.

During the year ended 31st December, 1923, 40,319,363 superficial feet of timber were imported, compared with 31,341,641 superficial feet for the previous period, representing an increase of 28·4 per cent. The increase is largely accounted for by heavy shipments of jarrah and Douglas fir (Oregon pine), amounting to approximately double the quantities imported in 1922. Large numbers of poles, chiefly ironbark, continue to be imported for electric transmission and telegraph work.

Several small shipments of hemlock cheese-crates and apple-cases were landed during the year.

The average import value (all species) for the year ended 31st December, 1923, was 1s. 2d. per 100 superficial feet lower than for the year ended 31st December, 1922. The value of Douglas fir increased by 2s. 6d. per 100 superficial feet during the same period.

More than twice the quantity of tanning-bark was imported during 1923 than during 1922, but, fortunately, at a decreased price of more than £2 per ton.



Graph showing Imports for Years ended 31st December, 1921–23.

The Forest Atlas.

The most important work in course of preparation during the year was the compilation of accurate working maps of each State forest in the Dominion, as required by section 25 of the Forests Act, 1921–22. In August last a definite policy was mapped out and put in action, and the results so far achieved are considered satisfactory. A base map is first plotted from information supplied by the Lands Department on a uniform scale of 20 chains to an inch, which shows the correct boundaries of the forests and all survey information available pertaining thereto, also all internal surveyed subdivisions, rivers, streams; omitting all approximately sketched details, as these are liable to lead to confusion when plotting the accurate internal details obtained by Forest officers. A tracing of this is then made and two white prints prepared. On the first of these is shown all licenses, leases, and types or stands, and on the second topography only. This information will be added to from time to time as cruising-work proceeds. For the year nineteen base maps and twenty-two tracings were completed. During the coming year it is intended to make a special feature of these maps in order that a complete record may be established.

On the 26th February the first series of maps was forwarded to the Surveyor-General for his certificate in terms of section 25 of the Forests Act, 1921-22.

Seven hundred and fifty copies of a standard-size plan sheet drawn up in this office were printed and distributed in regional offices. Three maps of New Zealand, showing region boundaries, &c., were lithographed and 550 copies received. These have been used extensively for illustrating reports and showing localities. The activities of the staff have for a considerable time past been directed towards the work of finalizing the Forest Inventory, this work taking precedence over all other except that of a very urgent nature. This work included the calculation of areas of the various species or stands and classified land in all regions; the preparation of maps, graphs, and tracings, of which a total of 188 have been prepared.

Work accomplished.

Tracings prepared	231	White prints .. .	462
Graphs prepared	155	Lithos amended and coloured	195
Maps mounted	52	Miscellaneous drawings ..	14

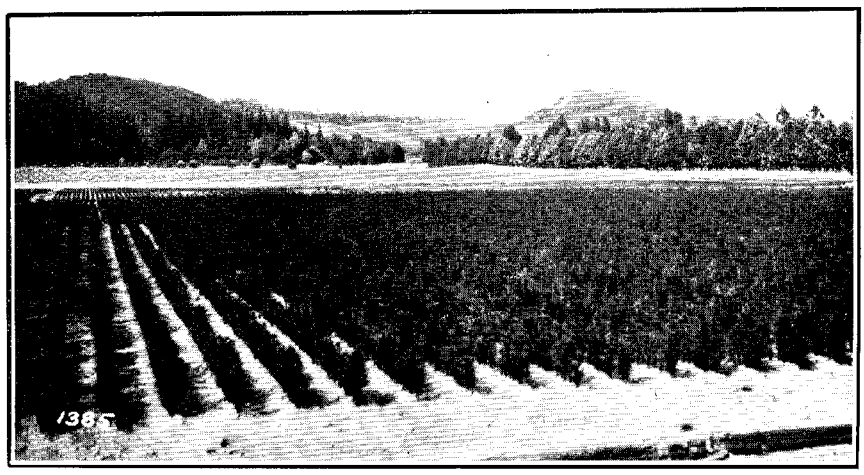
Two new wall index maps commenced.

Various circulars have been forwarded to Conservators, with a view to standardizing plan work in District Offices.

Natural Pine-regeneration in the Dargaville District.

Natural Regeneration, Beech Forest.

To face p. 16.



A Break of One-year Lined-out Seedlings (Pinus Insignis) grown at Rotorua Nursery for disposal to Farmers, Settlers, and Others.

Planting Marram-grass, Oroua Downs, Rangitikei Sand-dune Experiment Station.

Photographic Records.

The total number of negatives on record is 1,357. A total of 2,386 prints and 237 lantern-slides were prepared for the year. A systematic record for filing these was established during the year and is proving very efficient. Numerous applications for the loan of photos and lantern-slides from persons interested in forestry were met by the Service records.

Educational Publications.

The following publication and propaganda, &c., were printed during the year:—

3,000 leaflets: "Tree-planting" (Rotorua region).
5,000 leaflets: "Look at the Roots" (Rotorua region).
750 copies: "Forests and Forestry" (Imperial Forestry Conference).
2,000 copies: "Remarkable Pine."
5,000 copies: Amended Price-list (1923 season).
5,000 leaflets: "Commercial Tree-planting" (Rotorua region).
2,000 Picture advice-cards (Rotorua region).
2,000 leaflets: Propagation Forest-trees (Rotorua region).
500 copies pamphlet: "Timber for Sale" (distributed).
5,000 Folders: "Take One" (Rotorua region).
1,000 Bulletin: "Small Sawmills."
12,000 Price-lists, 1924 (North Island).
5,000 Price-lists, 1924 (South Island).
17,000 copies: "Tree-planters' Guide" (in course of publication).
2,700 posters advertising trees for sale were printed and distributed throughout the post-offices of the Dominion.
3,000 leaflets advertising "Tree-planting" were printed and forwarded to the Conservator of Forests, Christchurch, for distribution.
2,350 calico fire notices were distributed for 1923 season.
1,000 copies of a special poster for advertising sale of trees, &c., were printed and distributed.

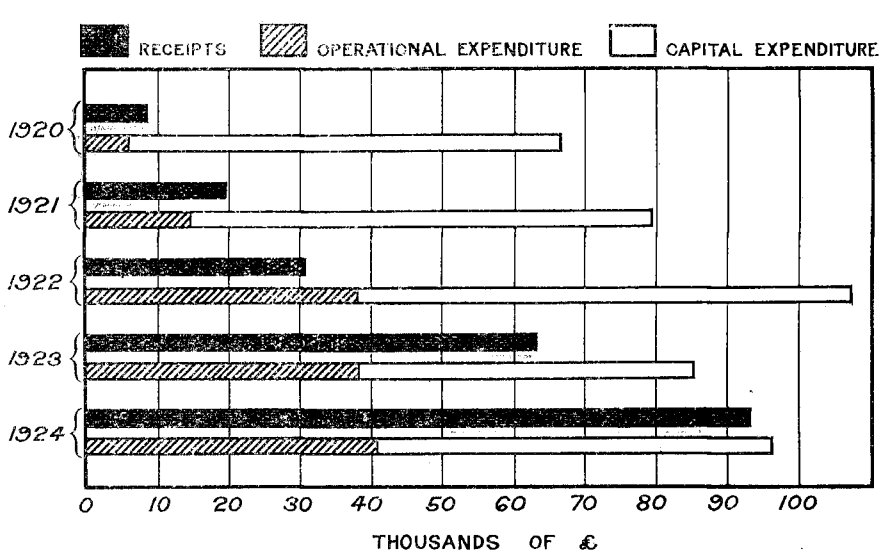
Forest Service Library.

The reference library at the Central office, now permanently located, is under the charge of a trained librarian, and has proved of great assistance to the operations of the Service. A large number of pamphlets were received from the Service's exchanges in all parts of the world. These, with reference books added, make a total of 454 for the year, and there are now 3,176 books and works of reference in the library.

All books are available for the use of the officers of the Service, wherever located, while, in addition, smaller permanent collections are provided for regional officers. As hitherto, the central office collection is at the disposal of the public for reference work.

Timber Royalties Commission.

During the year Mr. John Strauchon, I.S.O., was appointed a Royal Commission under section 40 of the Finance Act, 1921, to inquire and report upon the extent to which local authorities may incur loss of revenue through the passing of the Forests Act, 1921–22, and upon the provision which should consequently be made from the revenues of the State Forest Service or otherwise. The report has been presented to His Excellency the Governor-General and will be made public in due course.



State Forest Service Receipts and Expenditure for Period 1921–24.

ANNEXURES.

ANNEXURE I.—STATE AND PROVISIONAL STATE FORESTS AND FOREST RESERVES.

AREA IN ACRES AT END OF FISCAL YEAR 1924.

Land District.	Area in Acres at End of Fiscal Year 1923.			Changes in Area during the Fiscal Year 1923–24: Net Increase in Acres.			Area in Acres at End of Fiscal Year 1924.			Percentage of Area of Land District in Permanent and Provisional State Forest and Forest Reserves.
	State Forest.	Provisional State Forest.	Forest Reserves.	State Forest.	Provisional State Forest.	Forest Reserves.	State Forest.	Provisional State Forest.	Forest Reserves.	
N. Auckland..	102,485	37,292	..	2,324	6,740	..	104,809	44,032	..	3·3
Auckland ..	151,228	622,357	2,316	..	3,411	..	151,228	625,768	2,316	8·6
Hawke's Bay	199,653	53,735	16,921	1,171	..	507*	200,824	53,735	16,414	4·9
Taranaki ..	69,500	42,639	40,872	..	387	278*	69,500	43,026	40,594	6·3
Wellington ..	430,626*	144,708	9,593	26,045	100	4,512	456,671	144,808	14,105	8·7
Nelson ..	19,955	1,986,369	8,470	..	2,109	..	19,955	1,988,478	8,470	42·7
Marlborough	80,362	119,535	6,194	9,135	1,090	5,868	89,497	120,625	12,062	8·0
Westland ..	2,187	1,721,970	119	..	7,948†	..	2,187	1,714,022	119	44·4
Canterbury ..	290,202	..	..	20,515	..	319	310,717	..	319	3·3
Otago ..	128,280	315,844	543	4,827	18,168	1,565	133,107	334,012	2,108	5·1
Southland ..	136,734	575,017	..	385†	18,307	..	136,349	593,324	..	9·2
Totals ..	1,611,212	5,619,466	85,028	63,632	42,364	11,479	1,674,844	5,661,830	96,507	..

* Error in last year's figures due to survey. † Net decrease.

Permanent and provisional State forests and forest reserves under Service control comprise 11·2 per cent. of the total area of the Dominion. Total area of State forest and provisional State forest and forest reserves at 31st March, 1924, 7,433,181 acres.

ANNEXURE II.—REPORT UPON STATE FORESTATION OPERATIONS IN THE NORTH ISLAND.

(By H. A. GOUDIE, Conservator of Forests, Rotorua Conservation Region.)

EXTENSION OF PLANTATIONS.

Very satisfactory progress was made with extension work during the year, 5,614 acres of new area being planted with 3,851,440 trees of the following species: *Pinus ponderosa*, *P. radiata*, *P. strobus*, *P. Murrayana*, and *Pseudo-tsuga Douglasii*.

The total area now planted in the Rotorua region is 35,638 acres. After a very wet spring a long spell of dry weather was experienced during the summer, but in spite of these conditions the young trees have done remarkably well, the death-rates being 3 per cent. in *Pseudo-tsuga Douglasii*, 6 to 8 per cent. in *Pinus radiata*, and 8 per cent. in *Pinus strobus*. The planting was all done by the notching system, the labour-cost, 18s. per acre, being even lower than that of the previous year. The total cost per acre, including trees, amounted to £1 13s. 7d.

TREE-GROWING.

The growth of the nursery stock was very good; indeed, of eucalypts a record crop was obtained. For the better propagation and handling of the eucalypts a glasshouse was erected and used with very satisfactory results. A curing-house, to be covered in the winter with calico sheets, was also built, and in this the more tender species will be sheltered from the frost. The quantity of seed sown was 934 lb., and the trees raised 4,305,000, the total raised to date being approximately eighty-six million. The year's output of trees amounted to 5,394,000, while to date the total is 78,211,000; of these the plantations have taken approximately seventy-three million.

SEED-EXTRACTION PLANT.

During the year a seed-extraction house was built. The dimensions, &c., are—25 ft. long by 14 ft. wide, lined inside up to the eaves, T. and G. sarking under roofing-iron, concrete floor, ventilators top and bottom, and door at one end. Heat is supplied by two Shacklock "Tui" stoves stoked with empty pine-cones. The cones are placed in wooden trays with netting-wire bottoms, a space of about 6 in. being allowed between the trays, which are stacked 7 ft. high. By shaking and rocking the trays the released seed falls through the netting-wire tray-bottoms and eventually reaches a canvas-bottom tray, where it is held until removed. The opened cones are finally put into a "shaking-

machine," which is revolved sufficiently to shake out any remaining seeds. These appliances have proved very satisfactory and cheap. Since commencing operations in September, 1923, some 400 lb. of pine-seed have been extracted and cleaned at a labour-cost of 1s. per pound.

Sale of Trees and Seeds.

The satisfactory increase in business noted for the 1921–22 season was maintained during the one just passed. An advance in the number of orders received of 25 per cent. and of 33 per cent. in the total of trees sold must be considered satisfactory. In two districts (North Auckland and Taranaki-Wanganui) orders increased 100 per cent., despite the fact that freight to these localities is very heavy and had to be paid by consignees. An analysis of the sales shows that conifers to the number of 1,029,929 were sold. Eucalypts sold amounted to 369,405.

Replies to a circular sent out to last year's customers regarding the stock supplied to them indicate that the average loss in planting was surprisingly low. A large number of reports show about a 5-per-cent. death-rate, and very few indeed exceed 10 per cent. The information received by correspondence with customers has been exceedingly valuable to the Department, especially in regard to the suitability of the stock sold in certain districts. Appended are particulars of business done :—

Trees sold.

	1923.	1922.
To farmers and others	838,755	801,398
Public bodies	363,575	184,130
Other Departments	103,276	20,033
Soldier settlers	88,517	..
Schools and colleges	5,211	9,603
	1,399,334	1,015,164
Total number of orders	1,245	1,016

Arrangements have been made to handle approximately two million trees during the coming season, and the orders already booked indicate that this quantity will be disposed of if not exceeded.

Seed sold.

The amount of tree-seed sold totalled 577 lb.

Revenue.

Following are particulars of revenue from nursery and plantations received during the last two years :—

	1923–24. £ s. d.	1922–23. £ s. d.
Sale of trees	4,074 12 9	3,121 7 7
Sales of tree-seeds	546 1 6	574 16 2
Sales of firewood	47 13 11	2 0 0
Sales of posts, &c.	72 10 11	..
Grazing	222 13 10	207 15 9
Rental of departmental cottages	334 16 3	374 8 9
Inspections and reports	51 19 6	..
Sundries	184 12 9	130 11 4
	£5,535 1 5	£4,410 19 7

Fire Protection.

The protective system now in operation proved very satisfactory, and although extremely dry weather was experienced from November to the end of January no damage was done by fire. During the height of the tourist season extra patrolmen were employed. Since the creation of the fire districts the danger of fire from outside spreading into the plantations has been considerably reduced, and the landowners within the districts have complied with provisions in a most commendable manner. For the convenience of picnic-parties and fishermen fireplaces were formed near the Blue and Green Lakes, and have been freely used. Protective measures, including lookout patrol and firebreaks, cost on an average 3s. 2d. per acre over the 35,638 acres planted in the Rotorua conservation region.

Thinning Plantations.

Whakarewarewa Plantation.—A permit was granted to a firewood-merchant of Rotorua to cut posts, firewood, &c., over an area of 80 acres of twenty-three-year-old *Pinus austriaca* and 40 acres of *Eucalyptus Risdoni*. To date the areas treated show the following returns : 10 acres *Pinus austriaca*—146½ cords firewood ; 4,119 mine-props, poles, &c. 14 acres *E. Risdoni*—115½ cords firewood ; 3,256 mine-props, &c.

Waiotapu Plantation.—The thinning of a block of twenty-year-old *Pinus insignis* was undertaken during the year. This area was originally planted with 2,722 trees to the acre, and the thinning has reduced these to 607. The return in firewood from the 8 acres completed amounted to 50 cords per acre, at a cost of 13s. 6d. per cord.

Deer in Plantations.

Whakarewarewa Plantation.—Red deer have continued to do considerable damage to trees on the higher country. Many of the small trees which were damaged made a quick recovery, but even allowing for these the percentage of permanently injured trees is high on the more recently planted areas on Moerangi. Shooting was carried on in and out of season, and this had the effect of either driving the deer temporarily out of the plantation or sending them to cover, as they were not much in evidence during the winter months, but reappeared at the Wairoa end in large numbers in September. So long as the deer receive protection in any part of this district there is little prospect of clearing the plantation of the pest, as the amount of available cover makes it an ideal camping-ground. It is proposed to initiate a more vigorous campaign against these animals during the coming year at an estimated cost of £150. In the Kaingaroa Plains Plantation some twenty or thirty deer have been observed in the planted area at this station. So far no damage has been seen, but no doubt this will show up shortly.

Proposals for 1924–25.

Hereunder is shown briefly the proposed operations during the coming year:—

Tree-growing—

For plantations	5,000,000
For sales	2,000,000
	7,000,000 trees.

Establishing—

Kaingaroa Plains	4,200,000 trees on 6,000 acres.

Utilization—

Thinning—

Whakarewarewa Plantation	50 acres *Pinus Laricio* and *Eucalyptus Risdoni* (under permit).
Waiotapu Plantation	20 acres *Pinus radiata* by plantation labour.

ANNEXURE III.—REPORT UPON STATE FORESTATION OPERATIONS IN THE SOUTH ISLAND.

(By W. T. Morrison, Conservator of Forests, Canterbury-Otago Conservation Region.)

Extension of Plantations.

The past year has been marked by distinct progress in afforestation operations in the South Island, and I have to report a general advance in the results of both tree-raising and plantation operations.

The total planting operation for the year was 1,453 acres of new area, which constitutes a record for the past ten years. The main planting was at Hanmer Springs and Balmoral, where a total of 1,038¾ acres were formed. The "strike" was eminently successful, and the mortality can be averaged at 3·95 per cent., the actual figures being—Hanmer Springs Plantation 4·7 per cent., and Balmoral 3·2 per cent. The main planting consisted of *Pinus ponderosa*, *P. Laricio*, and *P. Banksiana*, of which the total number for the two plantations was 668,310 trees. The actual mortality with these species was less than 1 per cent., the higher figures being accounted for by *P. radiata*, *P. pinaster*, and Douglas fir, of which only a small quantity was planted. These satisfactory results are due mainly to the introduction of a new planting-implement, the adoption of a more natural system of planting based on observation of local soil conditions, and the use of the planting-bucket in lieu of the old canvas planting-bag. The new implement is on similar lines to the Schlich planting-spade, but has been modified to suit the special soil conditions. Not only has it ensured a higher "strike" percentage, but it has considerably reduced the planting-costs per thousand trees by eliminating pre-pitting costs. The planting-bucket eliminates the drying-out of the roots while trees are being carried by the planter.

The operations in the Tapanui district totalled 307¼ acres, but the results are not quite as successful as those at Hanmer Springs, owing mainly to soil and climatic conditions. In spite of adverse conditions the death-rate up to the end of January did not exceed 5 per cent. over the whole planting, which must be considered satisfactory under the circumstances.

With the exception of Naseby Plantation, the direct method of planting either by notching or grubber system has proved its efficiency under what may be considered an extremely severe test. A comparison of costs between the direct planting and that of pre-pitting shows a reduction of approximately 20s. per acre, and, although the mortality has proved slightly higher as far as the Tapanui district is concerned, the advantage is still with the direct method. At Hanmer Springs the mortality has been very much lower than was the case with the old pre-pitting method.

The total number of trees planted on new area during the year was 1,098,767, and the number used for blocking up previous failures 176,968.

Tree-diseases.

The spruce-aphis has again caused considerable damage to Sitka, Norway, and white spruce, and in a number of cases trees have been killed. The experience has been common with the above species throughout the South Island this year, and there seems to be no practical remedy so far. The matter has been referred to the Government Entomologist, who contemplates introducing a natural enemy.

Forest-fire Prevention.

The fire season has been an abnormally dry one, and officers and staff have had a very anxious time since November. It is satisfactory to report an absence of damage to established plantations, due mainly to the vigilance of the patrol staff and officers in charge of plantations, and to the efficient fire-break system of protection. Special attention was given to this phase of the work, and all fire-breaks, where necessary, were ploughed or cultivated, and portions inaccessible to implements were dealt with by hand grubbing and clearing, &c. Two new fire districts were proclaimed, one comprising the area surrounding Hanmer Springs Plantation and the other Balmoral Plantation. Five fire districts are now in operation, and this system appears to be acting well, no breaches of the regulation affecting these having been recorded.

Lookouts were maintained at Hanmer Springs and Conical Hills during the danger season from the 1st November to the 31st March, and they are still being placed on this duty occasionally as weather conditions warrant it, the country generally being still in a very dry condition.

Grazing.

The policy of grazing fire-breaks at Conical Hills and Dusky Hill Plantations has been continued by leasing the rights to local farmers, the departmental flock having been disposed of last year. Several small vacant areas are also leased to employees and others.

Labour.

Ample labour has been available throughout the season. Clearing operations at Hanmer Springs were done mainly by piecework, the men being paid at so-much per chain for line and fire-break clearing.

Survey Work.

In January the Forest Surveyor made a survey of the new area being added to Hanmer Springs Plantation. This, which will include a topographical survey, will, when completed, greatly facilitate the working of the area and assist in the location and grading of roads and fire-breaks.

Nurseries.

Tree-raising operations at the South Island stations have been attended with considerable success this season in spite of the difficult climatic conditions experienced. The nurseries are carrying at present practically 10,626,624 trees, ranging from one to three years. Approximately 2,255,950 trees will be available for transfer this year to plantations, farmers, and public bodies, &c.

At Hanmer Springs Nursery the major portion of the seeds was sown in open lines with excellent results, and a substantial reduction in cost, some 3,060,000 being raised by this method. It is hoped during the coming season to bring into use for open-lines sowing a portion of the area reserved as a new nursery-site at Crookston. This is practically virgin ground, which should give good results. It will also relieve some of the worked-out land in Tapanui Nursery.

Trees transferred.

During the season trees to the number of 1,801,163 were transferred to plantations, settlers, and local bodies, &c., distributed as follows: Plantations, 1,275,735; farmers and local bodies, 440,178; West Coast Experimental Area, 85,250.

Special care was given to the packing of trees this year, and many complimentary references have been received from various sources as to the careful manner in which trees were packed and the good condition in which consignments reached their destination. In one or two cases it was necessary to transfer large consignments—viz., to the West Coast, and from Ranfurly and Tapanui to Balmoral, &c. This meant special packing arrangements, and a form of crating was adopted whereby the trees were placed in tiers in closed railway-trucks, the trees being placed in an upright position with their roots packed in damp sphagnum moss, each tier being free from pressure from those above. By this method 52,000 trees were consigned in one truck, and they arrived in splendid condition, without heating or suffering in any way. The fact that a 99-per-cent. "strike" was registered with these after being transported a distance of over three hundred miles speaks for itself.

Seed sown.

A total of 1,030 lb. of tree-seeds were sown during the year, the results from which were six and a quarter million seedlings. This gives an average germination of over 6,000 per pound, which must be accounted very satisfactory when all species are considered.

A very cheap and practical method has been devised by Senior Ranger D. J. Buchanan at Tapanui for extraction by sun-heat, and this has answered the purpose admirably so far. A tier of inverted seed-frames with the netting attached is built up with battens on the sunny side of a wall. The frames are spaced one above the other at a distance of about 2 ft., with a canvas sheet beneath the lower one. The cones are spread out over the netting, and as they open the seed falls through the netting to the sheet below and is collected each day. Protection is afforded at night and in wet weather by a canvas sheet which covers the top frame and falls down over the front. A stirring of the cones with a rake or by hand shakes the seed out. This method takes a little longer than extraction by artificial heat, but is much more reliable.

Forest-extension.

Sales of trees to settlers and local bodies, &c., during the year totalled 440,178 trees. A considerable number of applications in excess of the trees available were received, and at least 100,000 more *Pinus radiata* would have been supplied had sufficient stock been available.

The number of trees reserved for forest-extension this year is 857,775, of which 521,775 are *Pinus radiata*, 78,400 *Cupressus macrocarpa*, and 40,000 Douglas fir.

Sale of tree-seeds totalled 41 lb.

Two afforestation companies which are contemplated will probably be established in Canterbury during the coming year. The proposals call for the establishment of 12,500 acres of plantations.

Addresses, etc.

In all, fifteen addresses to local bodies were given, and seventy-three special inspections of planting-sites were made.

Revenue.

	1923–24. £ s. d.	1922–23. £ s. d.
Sale of trees	1,893 18 8	1,759 9 6
Sale of seeds	82 11 0	55 19 10
Sale of firewood	89 12 6	75 2 6
Sale of posts, &c.	5 18 6	6 18 8
Grazing	235 8 11	41 10 0
Rental of departmental cottages	297 2 1	271 16 10
Sheep and wool	53 12 5	761 13 10
Miscellaneous	25 0 0	29 0 1
	£2,683 4 1	£3,001 11 3

Proposals.

The planting programme for the coming year is as follows: Hanmer Springs Plantation, 750 acres; Balmoral Plantation, 450 acres; Greenvale Plantation, 500 acres; Naseby Plantation, 100 acres: total, 1,800 acres.

In addition to the above, arrangements have been made for the supply of sufficient trees to plant 200 acres at the West Coast Experimental Area.

ANNEXURE IV.—SUMMARIES.

Summary of Operations in Nurseries during the Year ended 31st March, 1924.

Name of Nursery.	Total Expenditure.				Trees in Nurseries.			
	Tree-growing.	Maintenance.	Buildings, &c.	Total.	Estimated Trees raised during Year.	Output of Trees.		Estimated Number in Nurseries at 31st March, 1924.
						Trees sent to Plantations during Year.	Trees sent to Outside Places during Year.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.				
Rotorua	7,208 7 9	473 7 4	617 17 6	8,299 12 7	4,305,400	3,994,898	1,399,334	8,314,700
Tapanui	2,157 11 9	2,070 13 5	29 18 9	4,258 3 11	1,467,600	504,575	341,431	3,251,750
Hanmer Springs	1,190 12 7	1,457 13 4	176 15 4	2,825 1 3	4,632,024	535,660	159,797	6,976,224
Naseby	393 18 6	74 16 8	..	468 15 2	167,700	235,500	24,200	398,650
Ranfurly*	..	10 6 6	..	10 6 6	..	..	..	..
	10,950 10 7	4,086 17 3	824 11 7	15,861 19 5	10,572,724	5,270,633	1,924,762	18,941,324

* Nursery now closed.

Summary of Operations in Plantations during Year ended 31st March, 1924.

Name of Plantation.	Trees.			Total Expenditure for Year, including Cost of Trees from Nurseries.	New Area planted.
	Number received from Nursery.	Number used to replace Losses.	Number planted on New Area.		
				£ s. d.	Acres.
Kaingaroa Plantation*	3,931,415	79,975	3,851,440	15,038 17 0	5,614·6
Puhipuhi	..	..	..	422 10 6	..
Conical Hills	7,000	7,000	..	1,115 18 0	..
Pukerau	23;975	17,538	6,437	615 1 3	7·25
Dusky Hill	..	..	..	512 19 4	..
Greenvale	323,600	13,680	309,920	4,006 17 11	340
Naseby	183,500	120,050	81,450	2,524 17 1	67
Hanmer Springs	339,215	..	339,215	4,640 16 5	498·75
Balmoral	398,445	36,700	361,745	3,080 5 0	540
Westland	85,250	..	85,250	1,243 7 4	140
	5,292,400	256,943	5,035,457	33,201 9 10	7,207·6

* Formerly shown as Kaingaroa West and Kaingaroa Plains Plantation.

Summary of Operations in Nurseries from 1896 to 1924.

Name of Nursery.	Total Expenditure.				Trees in Nurseries.		
	Tree-growing.	Maintenance.	Buildings, &c.	Total.	Estimated Number of Trees raised during Year.	Output of Trees.	
						To Plantations.	To Outside Places.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.			
Rotorua ..	92,793 17 1	9,287 10 4	14,309 3 11	116,390 11 4	86,525,859	72,758,179	5,452,980
Tapanui ..	40,057 4 10	13,588 13 4	7,595 6 6	61,241 4 8	23,925,202	17,835,543	2,010,145
Hanmer Springs	23,143 8 10	7,813 6 10	5,100 14 6	36,057 10 2	21,018,924	12,792,895	1,196,062
Naseby ..	797 19 0	74 16 8	..	872 15 8	443,200	235,500	24,200
Ranfurly* ..	18,425 16 3	4,236 18 2	4,552 16 1	27,215 10 6	7,280,501	6,465,593	509,858
Starborough* ..	6,399 9 10	..	2,856 17 3	9,256 7 1	3,059,610	1,965,095	1,094,515
Kurow* ..	960 4 2	..	2,109 18 5	3,070 2 7	172,460	..	172,460
Totals ..	182,578 0 0	35,001 5 4	36,524 16 8	254,104 2 0	142,425,756	112,052,805	10,460,220

* Nursery now closed.

Summary of Operations in Plantations from 1896 to 1924.

Name of Plantation.	Trees.				Total Expenditure to Date, including Cost of Trees from Nurseries.	Total Area planted.	Total Expenditure per Acre planted, including Cost of Buildings.
	Number raised from Seed sown *in Situ*.	Number received from Nursery.	Number used to replace Losses.	Total Number in Plantations.			
					£ s. d.	Acres.	£ s. d.
Whakarewarewa	109,725	20,602,850	3,976,264	16,736,311	117,323 11 2	8,037*	14 11 11
Waiotapu	83,121	23,506,152	4,860,134	18,729,139	89,140 13 10	7,010*†	12 14 4
Kaingaroa Plantation ..	..	27,397,890	3,188,160	24,209,730	138,003 10 2	20,591	6 14 1
Puhipuhi	..	1,419,000	419,000	1,000,000	12,266 16 4	1,200	10 4 5
Conical Hills	..	10,758,401	1,472,105	9,286,296	62,949 2 6	3,533½	17 16 3
Pukerau	..	894,835	74,838	819,997	9,513 0 7	572¾	16 12 2
Dusky Hill	..	3,061,997	881,160	2,180,837	24,075 0 0	745¾	32 5 8
Greenvale	..	3,226,295	306,455	2,919,840	42,400 8 3	2,050¾	20 13 6
Gimmerburn	..	936,235	783,339	152,896	6,907 0 1	88	78 9 9
Naseby	..	5,662,883	796,680	4,866,203	45,268 0 5	2,217¾	20 8 2
Hanmer Springs	..	9,922,473	1,818,374	8,104,099	50,550 0 6	3,412¼	14 16 3
Balmoral	..	3,050,397	703,790	2,346,607	35,094 9 2	1,796½	19 10 8
Raincliff	..	..	..	50,000	1,123 1 2	206	5 9 0
Experimental Group.							
Waitahuna	..	42,025	11,500	30,525	319 7 9	11	29 0 8
Tekapo‡	..	48,000	..	48,000	275 8 3	29	9 9 11
Dumgree	..	1,679,765	1,110,125	569,640	16,309 16 7	209	78 0 9
Galloway	..	6,930	3,050	3,880	84 19 10	2	42 9 11
Omarama	..	4,390	..	4,390	80 12 9	2	40 6 5
Totals	192,846	112,220,518	20,404,974	92,058,390	651,584 19 4	51,627·13	..

* Discrepancy with areas shown in previous reports was discovered during a survey made in 1922-23.

† Kaingaroa West and Kaingaroa Plains Plantations have been amalgamated as "Kaingaroa Plantation," and a portion of Waiotapu Plantation included in Kaingaroa Plantation.

‡ Now under the control of Mackenzie County Council.

ANNEXURE V.—EXPORTS AND IMPORTS OF SAWN TIMBER AND OTHER FOREST PRODUCTS.

Exports.

(From information supplied by the Comptroller of Customs. All figures refer to the years ended 31st December, 1921, 1922, 1923.)

Item.	1921.			1922.			1923.		
	Quantity.	Per Cent.	Value.	Quantity.	Per Cent.	Value.	Quantity.	Per Cent.	Value.
	Sup. Ft.		£	Sup. Ft.		£	Sup F.		£
Kauri	2,732,116	5·9	46,421	3,017,607	6·8	58,731	3,011.151	6·2	60,272
Rimu	7,834,463	17·1	66,198	4,696,767	10·6	40,601	7,575,181	15·8	59,926
White-pine	31,561,547	68·7	353,467	35,177,764	79·6	363,668	34,897,728	72·6	320,409
Beech	964,574	2·1	12,576	709,675	1·6	10,166	1,266,869	2·6	16,438
Other (New Zealand) ..	2,823,096	6·1	25,260	595,663	1·4	6,528	817,561	1·7	8,229
Other (foreign) ..	32,711	0·1	870	17,023	..	427	525,016	1·1	6,531
Totals ..	45,948,507	100·0	504,792	44,214,499	100·0	480,121	48,093,506	100·0	471,805
	Tons.		£	Tons.		£	Tons.		£
Tanning-bark ..	31	..	345	38	..	813	73	..	1,045
Kauri-gum	3,901	..	367,197	6,391	..	563,270	6,598	..	596,222
Fungus	80·8	..	12,852	161·8	..	22,271	96·7	..	9,202

IMPORTS.

(From information supplied by the Comptroller of Customs. All figures refer to the years ended 31st December. 1921, 1922, 1923.)

Item.	1921.		1922.		1923.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Sup. Ft.	£	Sup. Ft.	£	Sup. Ft.	£
Ironbark	12,195,746	248,276	13,601,957	228,943	12,806,905	194,478
Jarrah	7,371,631	132,900	4,764,603	75,605	8,973,586	127,804
Douglas fir	12,431,779	120,635	3,974,811	33,190	8,081,088	77,473
Other	13,870,438	285,290	9,000,270	155,494	10,457,784	211,478
Total	45,869,594	787,101	31,341,641	493,232	40,319,363	611,233
	Number.	£	Number.	£	Number.	£
Laths, rails, palings, &c. ..	7,400,317	18,211	6,563,749	14,542	13,709,189	27,329
	Tons.	£	Tons.	£	Tons.	£
Tanning-bark	2,556	38,632	1,623	21,860	3,433	38,517
Wood-pulp	350	13,377	732	10,840	855	12,784

ANNEXURE VI.—SOME NOTES ON THE BRITISH EMPIRE FORESTRY CONFERENCE HELD IN CANADA DURING THE YEAR 1923.

New Zealand was represented at this Conference by the Director of Forestry. A set of resolutions were passed by the Conference. It is with some degree of satisfaction that the Service is able to report that Resolutions (*a*), (*b*), and (*c*) of No. 1 had already been put into action by New Zealand several years ago.

Resolution No. 2, dealing with softwood resources, already forms part of the New Zealand forest policy.

Resolution No. 3, Empire Trade in Forest Products, is one which has formed the basis of action for this country for many years.

Resolution No. 4—Education (Central Institution): New Zealand in principle agreed to this at the 1920 Conference.

Resolution No. 5—British Empire Forestry Association: This is a desirable form of co-operative action.

Resolution No. 6—Standing Committee on Empire Forestry: This resolution will assist in co-ordinating forestry work throughout the Empire.

Resolutions Nos. 7, 8, 9, and 10 are not of great interest to New Zealand, except in so far as this Service may co-operate in regard to No. 7.

Resolution No. 11—Next Conference: This resolution is of direct interest to New Zealand, and it is to be sincerely hoped that this Dominion will co-operate with the Australian Commonwealth in making the 1928 Conference a success.

THE RESOLUTIONS.

1. *Forest Policy.*—Believing them to be well founded, this Conference reaffirms Resolutions 1, 2, and 3 of the 1920 Conference, which emphasize the great importance of each part of the Empire laying down a definite forest policy, surveying its resources of timber, and ensuring that certain elements of stability are secured in the constitution of forest policy.

These resolutions are as follows:—

"(*a.*) *Forest Policy.*—In view of the great importance to the Empire as a whole, as well as to each of its component parts, of producing a sustained yield of all classes of timber, and of encouraging the most economical utilization of timber and other forest products, and of maintaining and improving climatic conditions in the interests of agriculture and water-supply, each of the Governments of the Empire should lay down a definite forest policy to be administered by a properly constituted and adequate Forest Service.

"(*b.*) *Survey of Resources.*—The foundation of a stable forest policy for the Empire and for its component parts must be the collection, co-ordination, and dissemination of facts as to the existing state of the forests and the current and prospective demands on them.

"(*c.*) *Constitution and Status.*—In order to attain continuity in the development of forest resources it is desirable that certain elements of stability be secured in the constitution of the forest policy. This may be done by the following measures:—

"(1.) The definition, where this has not been done already, of forest policy, in a forestry Act or Ordinance.

"(2.) The reservation for the purpose of economic management and development of forest land under conditions which prevent the alienation of any which is primarily suitable for forests except for reasons consistent with the maintenance of the forest policy as a whole.

" (3.) The assurance to the forest authority of funds sufficient to carry out the accepted policy for a series of years.

" (4.) The grant to members of the Forestry Service of the status of Civil servants, with due provision for pension.

" (5.) The appointment as the chief officers of the Forestry Service of persons having a high standard of training in forestry, their selection and promotion being by merit alone.

" (6.) The establishment in each of the larger parts of the Empire, and for the colonies not possessing responsible Government collectively, of an officer or officers having special duties of advising as to forest policy and surveying its execution."

2. *Softwood Resources.*—In view of the great and increasing drain on the softwood forests of the world, it is incumbent on every part of the Empire to conserve and augment its own resources of growing coniferous timber.

3. *Empire Trade in Forest Products.*—This Conference is of opinion that the Empire's requirements of timber and other forest products should be supplied to the greatest possible extent from sources within the Empire; that, while economic and geographical considerations may preclude the exclusive use of Empire timber, the trade between units of the Empire can be largely increased; that the Empire can become self-supporting in almost all minor forest products; that with these aims in view active steps should be taken throughout the Empire to organize and foster trade.

This Conference, owing to difficulties of time and access to documents, has not been able to complete its investigations into this subject, and recommends that it be remitted to the Standing Committee on Empire Forestry for presentation to the Imperial Economic Conference which meets in London during October next.

4. *Education (Central Institution).*—This Conference strongly endorses the view held by the 1920 Conference that a central institution for post-graduate and specialized training in forestry, combined with research, is essential to the proper development of the forest resources of the Empire, and regrets that owing to abnormal financial conditions the setting-up of such an institution has had to be postponed. This Conference approves the report of its Committee appointed to inquire into this subject, and urges the Departments concerned to take immediate steps to inaugurate a central institution for forestry training and research at Oxford University, so that, if possible, it may begin to function at the opening of the next academic year—*i.e.*, in October, 1924.

5. *British Empire Forestry Association.*—This Conference welcomes the incorporation by Royal Charter of the Empire Forestry Association, under the Presidency of H.R.H. the Prince of Wales, and commends its work to all interested in the forests of the Empire. This Conference considers that the *Empire Forestry Journal*, issued periodically by the association, should be the medium for the publication of official and technical information; that, pending the formation of an Empire Forestry Bureau, this information should be collected and prepared by the Standing Committee on Empire Forestry (see Resolution No. 6), assisted by technical correspondents in all the Forest Departments of the Empire.

6. *Standing Committee on Empire Forestry.*—With a view to maintaining continuity of action in respect to meetings of the British Empire Forestry Conference, this Conference recommends the establishment of a Standing Committee which should consist of—

The Chairman of the Empire Forestry Conference.

The Technical Commissioner of the British Forestry Commission.

The Head of the proposed Central Institution for Education.

One representative from each of the following: Colonial Office; India Office; the unit of Empire in which the last Conference was held; the unit of Empire in which the next Conference will be held; a member of the Council of the British Empire Forestry Association who has had experience in colonial administration—with power to add to their number.

7. *Investigations into Forest Products.*—This Conference notes with pleasure the steps taken in Great Britain to form a Forest Products Research Board, but urges that the scope of the Board's work be extended considerably so that in addition to fundamental research it may undertake investigations leading to the application of the results of research to commercial practice, in accordance with the methods which had been found profitable in the United States of America, Canada, and India. This Conference further urges that immediate steps be taken to establish in Great Britain a well-equipped Forest Products Laboratory.

8. *Forest-fire Protection.*—Canada.

9. *Silviculture.*—Canada.

10. *Shifting Cultivation.*

11. *Next Conference.*—This Conference accepts the gracious invitation of the Government of the Australian Commonwealth to hold the next meeting in Australia, and requests the Commonwealth representative, Mr. Owen Jones, to convey to his Government a message of cordial thanks and appreciation. At the same time this Conference wishes to place on record its opinion that, if suitable to the Commonwealth Government, the year 1928 would be the date most suitable for the meeting.

BRITISH EMPIRE FORESTRY CONFERENCE.

Victoria, B.C., Canada, 7th September, 1923.

NOTES ON THE FORESTRY CONFERENCE.

It was brought out that one-third of the world's forests, or 700,000 square miles, was within the British Empire, and of that quantity Canada holds 50 per cent., or 294,000,000,000 cubic feet. It was stated that during the past three years in Canada insects had destroyed sufficient timber to last

the paper industry of that Dominion for twenty-nine years, and during the past year also 800,000,000 cubic feet were destroyed by fire.

It is the opinion of many Canadian foresters— and the facts bear it out—that the fire losses are as serious as ever despite the refinements in control (airplane-lookout towers, telephones, tracks, &c.). The annual losses in Canada must extend over 2,000,000 acres per annum. In twenty years' time Canada will be suffering from a real timber famine. It is very obvious, however, that the people of Canada have at last come to their senses. In every province the one thing stressed above all was the forest-fire question.

It is now being realized that adequate forest-regeneration will come by allowing Nature to work in her own way. However, artificial reforestation inspired by the State is now being actively pushed by the Dominion Government, which maintains two large nursery stations, and by the Quebec and Ontario Provinces, and similar action will soon be taken by the New Brunswick Government. The aggregate distribution of trees by these Governments to local bodies and settlers amounts to fifteen million plants per annum.

Canada must very soon formulate a policy of Canada's timber for Canadians. (At the present time, in fact, a Royal Commission is considering the general question of restriction of export of pulp-wood.) An outstanding feature of forestry in Canada is the splendid progress that is being made in forest research through the operation of experiment stations, permanent sample plots, and laboratories, and in the intensive study of wood-waste problems. Canada is determined to use all of her forests to the limit, and hundreds of thousands of dollars are being expended, all with good results. The use of the hydroplane, the wireless, and the radiophone are met with everywhere, and the work in the forest office and in the field is being generally facilitated thereby.

In the application of the sustained-yield principle to the forests whereby the increment only is annually harvested, India, South Africa, and the Malay States undoubtedly lead within the Empire. In this respect New Zealand and Australia lag. However, as regards the policy of afforestation, New Zealand is well ahead comparatively, and with a few minor exceptions it ranks with the systems of Canada and elsewhere.

Notes on Forest Conditions in the United States.

1. The American people are cutting and destroying their forest resources at least four times faster than they are being replaced by growth. According to conservative authority—*i.e.*, Professor Kirkland of the University of Washington—the west-coast resources held in private hands will be exhausted in seventeen or eighteen years. It is very obvious, therefore, that the United States must withdraw from the export timber trade within a very few years.

2. A realization of the aforementioned position by the Federal forestry officials has brought forward a proposal to legislate an Act requiring all timber-land operators to maintain adequate fire-preventive patrol, and to keep their forest lands continuously productive.

3. The United States Forest Service has now applied permanent forest working plans to several of their national forests. Under these working-management plans the forests are so cut as to provide sustained timber crops in perpetuity. In this respect the Americans lead in North America.

4. Several important timber-manufacturing and timber-holding concerns have recently placed their private holdings under permanent forest-management. This is the most hopeful move that has taken place for many years—the Ford Motor Company and the Union Lumber Company of California are two prominent leaders in this respect.

5. Generally speaking, American forest-tree nursery and plantation practice as exposed at several stations does not compare favourably as regards technique, care, cost, or results with the standard New Zealand Government practices.

6. With regard to forest education and research, of course the United States leads the world in the facilities provided and in the results attained. In this respect much assistance was granted the writer in his investigations.

7. The tendency in the United States forestry circles, particularly in the west, is to follow the French "extensive" attitude towards forest-management, silviculture, and regulation, as opposed to the German "intensive" viewpoint—*e.g.*, silvicultural rules—and cutting plans aim at utilizing the stored ground seed in regenerating the Douglas fir stands, whilst heavy selection cuttings are favoured in the yellow-pine areas.

Conclusions.

1. New Zealand leads in State forest dedication procedure, in afforestation practice, in timber-sale administration, in the extent of communal forestry, in forest taxation, and in the expression of the national forest consciousness.

2. New Zealand in its national forest policy lags seriously in the application of applied forestry principles, due largely to the lack of trained men to apply the principles of tree-farming. A forest school is sadly needed.

3. New Zealand (and certain other countries for that matter) is too extravagant in its woods-exploitation practice, for millions of tons of wood are being wasted every year. An experimental wood-drying kiln and properly equipped forest-products laboratory are needed now.

4. The writer is more than satisfied that New Zealand must grow her own wood-supplies or go without.

5. In view of the fact that our national producing forest capital is barely sufficient to supply our own present and reasonable future needs, and in view of the alarming decrease in the world's visible supply of standing timber, the writer unreservedly endorses the policy of restriction of timber export. Unrestricted export will only mean higher prices in the domestic market and actual timber famine in such timber as kauri.

ANNEXURE VII.—STATE FORESTS ACCOUNT.

Receipts and Payments Account for Year ended 31st March, 1924.

Receipts.	£ s. d.	£ s. d.
To Cash in hand, 1st April, 1923—		
Cash in Public Account	10,532 6 4	
Imprest accounts outstanding	2,413 0 8	
Investments Account	166,843 19 1	
		179,789 6 1
Treasury Stamp Duties Suspense Account—		
Proceeds of stock issued		208 15 10
Interest on securities invested		6,013 2 1
Ranfurly Nursery—		
Sale of improvements		1,996 10 0
Forest receipts—		
National endowment	7,949 9 10	
Mackenzie County Council Plantations	17 10 0	
State forests and provisional State forests—		
Timber-sales	63,966 15 1	
Timber royalties	4,221 14 10	
Timber trespass	63 14 3	
Leases—Grazing	2,810 11 4	
Leases—Sawmill-sites	303 18 7	
Leases—Industrial	569 6 6	
License and transfer fees	135 18 0	
Miscellaneous	631 2 8	
Permits—Grazing	37 10 0	
Permits—Miscellaneous	459 0 4	
Rent of house	12 0 0	
Kauri-gum	764 16 11	
Opossum revenue	3,309 9 5	
	77,285 17 11	
Nurseries and plantations—		
Trees	5,968 11 5	
Seeds	628 12 6	
Firewood and poles	215 15 10	
Grazing	466 12 9	
Sale of sheep and wool	53 12 5	
Rents of houses	631 18 4	
Miscellaneous	261 12 3	
	8,226 15 6	
		93,479 13 3

Payments.	£ s. d.	£ s. d.	£ s. d.
By Charges and expenses for raising loans—			
Stamp duty on transfers	115 4 1		
Recoupment of management charges on consolidated stock	63 10 2		
		178 14 3	
Interest on loans	23,171 11 2		
Sinking fund	913 2 4		
		24,084 13 6	
			24,263 7 9
Capital charges—			
Sub II.—General development of State forests—			
Buildings	339 8 9		
Motor-vehicles, field and office equipment	1,165 18 0		
Forest atlas	419 16 1		
Roads, trails, and telephone-lines	411 7 4		
Demarcation	169 2 11		
		2,505 13 1	
Sub. III.—Forest-fire prevention—			
Equipment and protection improvements		94 13 3	
Sub. IV.—Educational—			
Reference library and text-books	77 16 7		
Photographic equipment	40 15 0		
Forest exhibits	2 3 4		
		120 14 11	
Sub. V.—Forest research—			
Forest experiment station	1,640 14 7		
Timber-testing and ecological equipment	240 2 1		
Purchase of nursery-site (Kanieri)	450 0 0		
		2,330 16 8	
Sub. VI.—General afforestation—			
Nurseries and plantations, planting	35,525 14 8		
Salaries (afforestation)	8,526 8 3		
Sand-dune reclamation	1,328 9 3		
Temporary assistance	500 7 8		
		45,880 19 10	
Sub. VII.—Acquisition of indigenous forests—			
Purchase of timber, Otanewainuku S.D.	3,500 0 0		
Waipoua, purchase of additional blocks	973 13 0		
		4,473 13 0	
			55,406 10 9
Operation and maintenance charges—			
Salaries		21,686 18 6	
Sub. II.—General development of State forests—			
Communication expenses — Printing and stationery, &c.	1,270 19 2		
Fiscal management expenses	81 7 4		
Forest and grazing reconniassance, timber cruising and appraisal, policing patrol, and maintenance, &c.	5,731 8 1		

ANNEXURE VII.—STATE FORESTS ACCOUNT—*continued.*

RECEIPTS AND PAYMENTS ACCOUNT FOR YEAR ENDED 31ST MARCH, 1924—*continued.*

Receipts.	£ s. d.	*Payments.*	£ s. d.	£ s. d.	£ s. d.
		Office rent, heating, lighting, &c.	2,445 11 0		
		Legal expenses and contingencies	34 7 9		
		Temporary assistance—Overtime	1,394 9 6		
		Transportation expenses and upkeep of motor-vehicles	943 6 1		
		Travelling-expenses—Transfer of officers	2,200 1 9		
				14,101 10 8	
		Sub. III.—Forest-fire prevention—			
		Communication and locomotion expenses	516 1 2		
		Wages, &c.	1,378 14 2		
				1,894 15 4	
		Sub. IV.—Educational—			
		Forest exhibits	38 5 9		
		Photographic records	102 11 9		
		Departmental bulletins and professional publications	321 0 0		
				461 17 6	
		Sub. V.—Forest research—			
		Forest ecology	598 5 9		
		Silvicultural management studies	131 6 4		
		Utilization and timber-testing	767 3 1		
				1,496 15 2	
		Sub. VI.—General afforestation—			
		Preparation of planting-plans	..	686 7 2	
		Sub. VII.—Acquisition of indigenous forests—			
		Yearly rent, Otanewainuku S.D.	..	74 0 0	
		Sub. VIII.—Grants and subsidies to local bodies—			
		Director's expenses at Imperial Forestry Conference	400 0 0		
		Grant to Rangitikei County Council for roading	1,902 0 0		
		Cost of planting Mackenzie County reserves	193 10 0		
				2,495 10 0	
					42,897 14 4
		Cash balances at 31st March, 1924—			
		In Treasury Stamp Duties Suspense Account	93 11 9		
		In Post Office	3,212 5 10		
				3,305 17 7	
		In Public Account	10,913 16 10		
		In Investments Account	144,700 0 0		
				155,613 16 10	
					158,919 14 5
	£281,487 7 3				£281,487 7 3

NOTE.—The receipts include amounts received by the Post Office before the close of the financial year, but not paid into the Public Account until after the 31st March, 1924.

9th June, 1924.

E. PHILLIPS TURNER, Secretary of Forestry.
A. W. GYLES, Reg. Acct., A.I.A.N.Z., Accountant.

I hereby certify that the statement of receipts and payments has been duly examined and compared with the relative books and documents submitted for audit, and correctly states the position as disclosed thereby.—G. F. C. CAMPBELL, Controller and Auditor-General.

Loan Account as at 31st March, 1924.

To Loan authority—	£	s.	d.	By Debentures issued—	£	s.	d.
Section 50, Finance Act, 1916 ..	50,000	0	0	Finance Act, 1916 (section 50), at 4 per cent.	11,900	0	0
Section 32, Finance Act, 1918 (No. 2)	200,000	0	0	Finance Act, 1916 (section 50), at 4½ per cent.	38,100	0	0
Section 16, Finance Act, 1920 ..	250,000	0	0	Finance Act, 1918 (No. 2), (section 32), at 4 per cent. ..	80,000	0	0
Section 8, New Zealand Loans Act, 1908	4,373	0	2	Finance Act, 1918 (No. 2), (section 32), at 4½ per cent. ..	120,000	0	0
				Finance Act, 1920 (section 16), at 4½ per cent.	45,000	0	0
				Stock issued—			
				New Zealand consolidated stock, 1936–51, at 6 per cent.: Finance Act, 1916 (section 50), and Finance Act, 1920 (section 16) ..	1,774	12	10
				New Zealand consolidated stock, 1935–45, at 5 per cent.: Finance Act, 1916 (section 50), and Finance Act, 1920 (section 16) ..	204,396	13	5
				Balance of authority	3,201	13	11
	£504,373	0	2		£504,373	0	2

Note.—The authorities under the Finance Act were repealed by section 40, Forests Act, 1921–22, which authorizes borrowing-powers of £500,000.

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