

FORESTRY

Annual Report 1978·79

Queensland Department of Forestry

Presented to Parliament by Command.

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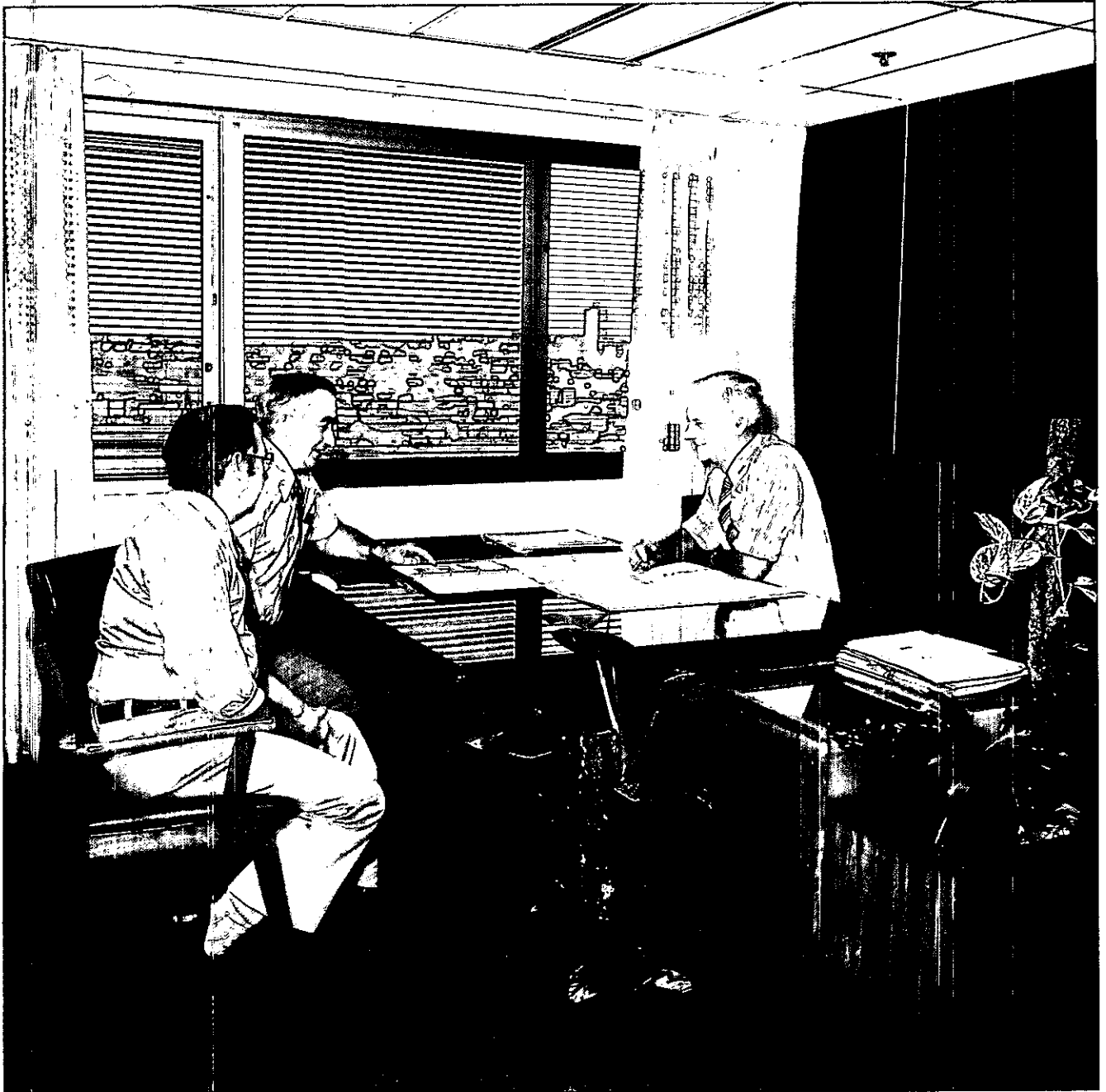
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The Conservator of Forests, Mr W. Bryan, with senior Departmental Officers in his new office at 41 George Street, Brisbane.

Introduction

A notable feature of the year under review was the movement of the Head Office of the Department to new premises in Mineral House. We are grateful for the tremendous improvement in accommodation standard, and a related increase in work efficiency is assured.

Mention was made last year of a new system of financial budgeting on a Department-wide basis. This gives emphasis to realistic delegation of authority and responsibility, with accountability for decisions at District and Divisional levels. The aim is to improve the management of available funds and to encourage efficiency. There was staff involvement in the preparation of guidelines, and this new system has been accepted with a great deal of enthusiasm within the Department. Results are most promising.

A significant number of officers retired during the year after lengthy periods of valued service, following the Government's decision that conditions for retirement at age 60 be made more favourable.

Included in the group were 13 Forest Rangers and Senior Forest Rangers with an average of over 40 years service with the Department.

This loss makes the commencement of training at the Gympie Training and Conference Centre even more timely.

The Centre was opened by the Honourable the Premier on 15th September, 1978, and provides splendid facilities for the training of field officers and for general Departmental "in service" training and Conferences.

When not so required it is also available for use by other Government departments and outside bodies and is fully booked for the next 12 months.

The first intake of 20 forest trainees under the Department's reconstructed training course is now in residence at the Centre.

The 1978-79 fire season was one of the mildest on record, and this allowed better than usual concentration of effort on silvicultural activities.

This is reflected in a record total of 6 827 hectares of conifer plantations which was established, of which 781 hectares were hoop pine and the balance exotic pines.

In order to maintain the rate of planting in the Gympie-Maryborough area, it was necessary to open up a major new planting front on the

Wongi State Forest, north of Maryborough. The interim moratorium on planting in the Noosa River catchment brought about this situation.

The other major development is that conifer planting in the Beerburrum area is being phased down because of limited land remaining available at this centre. This will allow the present north Queensland planting programme to be very substantially increased by opening up a planned new planting front in the Ingham area, assuming there is no reduction in the land area now considered as available for conifer plantations.

For many years there have been strong representations from the Ingham-Cardwell area for a greater rate of pine plantation activity, leading to a new base for industrial development. Such a planned expansion has not previously been possible, because of funding limitations.

Silvicultural treatment work in native forests covered 13 433 hectares of cypress pine and eucalypt country.

This work promotes stand vigour and increases productivity of commercial species to meet projected industry needs.

In the marketing area, there was a slight decrease in the volume of sawlogs sold from Crown lands, and a substantial decrease in the pulpwood volume harvested. However, this pulpwood volume decrease reflected an increasing usage of sawmill residues in the particle board and hardboard industries rather than a major lessening in production levels.

Concern was voiced last year at the fact that there had been no adjustments in Crown log stumpage levels since July, 1974, to match the movement in the Consumer Price Index.

It is pleasing to record that an overall increase of 13½ per cent was approved for application as from 1st July, 1979, even though the lag is still very substantial.

For some years, the Department has been providing public recreational facilities on State Forests to complement those provided by the National Parks and Wildlife Service and Local Authorities.

Surveys indicate that about 350 000 people are now using developed State Forest Parks each year, and it is thought that as many again are finding enjoyment in less formally developed areas of State Forest.

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Scenic Forest Drives have proved to be very popular, and new Drives were completed during the year at Mission Beach, Beerburrum, Wooroi and Sunday Creek.

During the year, the Department co-operated closely with the Brisbane Forest Park Authority and, on its behalf, undertook the design and construction of recreational facilities at Bellbird Grove in the Enoggera area.

The Department welcomed this opportunity to participate in the integrated recreational development of the Park.

An experimental solar kiln was established during the year at the Department's Salisbury Depot in collaboration with the timber industry. This has satisfactorily handled timber ranging from low-density pines to high-density ironbarks.

This is a new venture and in the climatic conditions of Queensland it would seem to have considerable potential as a cheap kiln for saw-mills with a fairly small timber throughput.

The long-planned programme for fumigation of 22 multi-storied buildings in the central Brisbane area commenced in May, 1979.

The aim is to eradicate the West Indian dry-wood termite, which escaped quarantine and which has the potential to cause great damage to timber structures north of latitude 35°.

It is intended that all known infestations in Brisbane, Maryborough and Bundaberg will be fumigated prior to the flight season in October, 1979.

The above is merely a brief commentary on some of the highlights of the year's activity, and much more detail is available in the body of the report.



Aerial photo of the Department's Complex at Gympie. Shown are the Training and Conference Centre (middle-ground) and the new Research Centre and District Office (right back-ground).

Principal Officers

Conservator of Forests	W. BRYAN, B.Sc.(For.), Dip.For.(Canb.)
Deputy Conservator of Forests	J. A. J. SMART, B.Sc.(For.), Dip.For.(Canb.)
Director, Division of Operations	J. J. KELLY, B.Sc.(For.), Dip.For.(Canb.)
Director, Division of Marketing	P. J. HAWKINS, B.Sc.(For.), Dip.For.(Canb.), Dip.For.(Oxon.)
Director, Division of Planning	J. D. H. MUIR, B.Sc.(For.), Dip.For.(Canb.)
Director, Division of Technical Services	W. M. ROBINSON, B.Sc.(For.), Dip.For. (Canb.)
Secretary to the Conservator of Forests and Director, Division of Administration	F. J. McCAUL, A.A.U.Q.

District Forester

Brisbane	N. StC. CLOUGH, B.Sc.(For.), Dip.For.(Canb.)
Dalby	D. M. WILSON, B.Sc.(For.), Dip.For.(Canb.)
Gympie	P. T. CRANNY, B.Sc.(For.), Dip.For.(Canb.)
Maryborough	P. J. KANOWSKI, B.Sc.(For.), Dip.For.(Canb.)
Monto	G. J. SWARTZ, B.Sc.(For.), Dip.For.(Canb.)
Murgon	J. F. BARDSLEY, B.Sc.(For.), Dip.For.(Canb.)
North Queensland	J. B. SCHAUMBERG, B.Sc.(For.), Dip.For. (Canb.)
Rockhampton	J. E. DUUS, B.Sc.(For.), Dip.For.(Canb.)
Warwick	T. N. JOHNSTON, B.Sc.(For.), Dip.For. (Canb.)
Yarraman	W. A. GREASLEY, B.Sc.(For.), Dip.For.(Canb.)

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Principal Statistics

								Hectares
FOREST AREA								
State Forest Reserve	3 609 652
Timber Reserve	..	..	..	..	..	..	..	589 207
Plantations—								
Total Area (Net) at 31st March, 1979	..	..	..	..	..	..	..	119 596
Area planted (Net) 1978-79	..	..	..	..	..	..	..	6 827

TIMBER CUT—CROWN LANDS 1978-79

								Cubic Metres (Gross)
Sawlog:								
Native Forests—								
Broadleaved	..	..	..	..	..	..	..	387 854
Coniferous	..	..	..	..	..	..	..	174 181
								<u>562 035</u>
Plantations—								
Broadleaved	..	..	..	..	..	..	..	307
Coniferous—								
Native	..	..	..	..	..	..	..	73 457
Exotic	..	..	..	..	..	..	..	89 756
								<u>163 520</u>
Pulpwood:								
Broadleaved	..	..	..	..	..	..	..	5 300
Coniferous—								
Native	..	..	..	..	..	..	..	11 187
Exotic	..	..	..	..	..	..	..	54 702
								<u>71 189</u>
Total Timber Cut								<u>796 744</u>

FINANCIAL

Receipts:									\$
Consolidated Revenue Fund	..	..	..	..	..	..	..	..	2,005
Loan Fund	..	..	..	..	..	..	..	..	1,840,509
Forestry and Lumbering Fund—									
Opening Balance	..	..	..	..	..	..	..	..	+270,348
Receipts	..	..	..	..	..	..	..	..	11,306,838
Balance Carried Forward	..	..	..	..	..	..	..	..	-261,824
									<u>\$11,315,362</u>
Reforestation Trust Fund—									
Opening Balance	..	..	..	..	..	..	..	..	+31,502
Receipts	..	..	..	..	..	..	..	..	16,595,400
Balance Carried Forward	..	..	..	..	..	..	..	..	-216,102
									<u>\$16,410,800</u>
Expenditure:									
Consolidated Revenue Fund	..	..	..	..	..	..	..	..	9,326,546
(including Salaries etc.)									
Loan Fund	..	..	..	..	..	..	..	..	15,099,888
Trust and Special Funds—									
Forestry and Lumbering Fund	..	..	..	..	..	..	..	..	11,315,362
Forestry Development	..	..	..	..	..	..	..	..	16,410,800

Division of Operations

General: The Division is largely responsible for expenditure under the Forestry Development Fund involving works under the Reforestation, Land Acquisition, Purchase of Plant, Roads Construction and Purchase of Working Equipment Votes. These operations involve silvicultural projects in plantations and native forests, fire protection, the construction and maintenance of roads and the construction of capital works as well as the replacement and use of Departmental mechanical plant and equipment.

Expenditure on projects under the Loan Fund on Recreational Facilities, under the Revenue Fund on maintenance of Recreational Facilities and under the Forestry and Lumbering Fund on Maintenance of Plant and Capital Improvements and Maintenance and Subsidies to Shire roads also is controlled by the Division.

The principal expenditure, however, was under the Reforestation Vote involving \$13,582,329. Funds provided here were insufficient to maintain the existing work force and average employment for 1978-79 was about 842 compared with about 904 in 1977-78 under the Reforestation Vote. The continuing reduction in the real value of available funds is causing concern and is reflected in a progressive reduction in staffing as indicated by the figures below.

Year	Average Employment
1975-76	1 252
1976-77	983
1977-78	904
1978-79	842

These reductions have been effected mainly by retirements and attrition, but the remaining staff are largely employees with considerable length of service.

The present number of employees also is very close to the minimum required to provide for the basic maintenance and protection of the forest estate which comprises about 3.6 million hectares of State Forests and including about 120 000 hectares of plantations. Any further reduction in the number of employees must put the safety of the forests from wildfires at risk.

Funds provided by the Commonwealth Government over a four-year period to relieve unemployment in the Maryborough-Gympie area following cessation of sand mining on Fraser Island contributed \$1,000,000 in 1978-79, and these funds enabled planting programmes to be maintained.

SILVICULTURE

Plantation Establishment: The area of plantations established in the year ended 31st March, 1979, was 6 827 hectares, comprising 6 046 hectares of exotic pines and 781 hectares of hoop pine. The total area of plantations established to 31st March, 1979, is now 119 596 hectares, 66 per cent of which is exotic pines and the remainder native species, mainly hoop pine.

The main exotic species planted are slash pine and Honduras Caribbean pine. Slash pine out-plantings are confined to the area south of Maryborough, whilst Caribbean pine species are used all along the coast to Atherton in north Queensland.

Exotic pine nursery stock is raised in various Departmental nurseries but principally in the highly mechanized nurseries at Toolara and Beerburum. Smaller nurseries provide planting stock at Kennedy, Byfield and Gregory. Slash pine has always been planted out open root but until recently it has been necessary to tube Caribbean pine which is a costly practice. Repeated root wrenching of Caribbean pine in the nursery with a mechanical root wrencher or pruner hardens the stock enabling it to be planted out open root satisfactorily, resulting in considerable savings.

Some of the existing nurseries, however, are unsuitable for application of the mechanical root-wrenching technique, being designed for raising tubed stock. To enable open root stock to be produced satisfactorily and economically, action has been proceeding to locate suitable replacement nursery sites near Ingham and Byfield. A site has been acquired near Ingham which will enable complete mechanized production of open root stock for all plantings in the Ingham and Cardwell areas.

Establishment of exotic pine plantations involves large-scale use of mechanical equipment. Large dozers are used to clear the depauperate eucalypt forest and to construct roads and fire-breaks. The cleared area is given at least one overall ploughing to reduce weed growth and also improve the area for mounding. Where necessary a second ploughing is done to control coppice and other seedling growth. The use of the ploughing technique reduces the need to apply hormones such as 2,4,5-T and also provides a bonus to growth of the pine seedlings through improved aeration and mineralization. The planting lines are mounded with a mounding plough largely to improve aeration in the poorly drained areas. This site preparation work is performed with various sized rubber-tyred four-wheel drive tractors.

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The Department itself maintains a large fleet of dozers and rubber-tyred tractors to ensure work is completed on schedule but a considerable amount of work also is let to contract. Over \$1,000,000 was paid to private contractors during the year for clearing and ploughing work.

Due to the present moratorium on planting in the Como Scarp Noosa River catchment area, only a limited area of land remains available for planting in the Toolara area. Action has been taken to purchase available suitable areas adjoining the Toolara reserve to the extent that funds were available, but in order to maintain the desired exotic pine planting rate in the Maryborough-Gympie area, action was taken to open up a new planting front on State Forest 1294, to be known as Wongi State Forest, just north of Maryborough. Excellent progress was made during the year with the establishment of a headquarters incorporating barracks, garage, storeroom and office and the clearing and site preparation of a substantial area for planting in 1979 together with the construction of many kilometres of access roads.

The major thrust in the Department's establishment of exotic pine plantations continued to be in the Gympie-Maryborough area in order to provide future supplies of pulpwood in accordance with the Government's decision for the establishment of a pulp mill and other wood using industries in the Gympie area. To date, about 48 000 hectares of exotic pine plantations have been established here, amounting to 68 per cent of the State's total area of exotic pine plantations.

With completion of planting of all available land in the Beerburum-Beerwah area in sight, action has been taken to phase down planting in this area to sustain employment over a longer period and to divert these funds to increase planting in the Ingham-Cardwell area. It is proposed to increase the planting programme in the Ingham-Cardwell area progressively to 800 hectares per year, provided adequate suitable planting land can be secured.

The planting of our native conifer, hoop pine, has been gradually decreasing due to the lack of available planting land. Hoop pine is planted on rain-forest type, generally on areas of fairly rugged topography, and on slopes up to 25 degrees. The area planted in 1978-79 was 781 hectares, compared with 942 in 1977-78. The planting of this species over the last forty years in reserves near Nanango, Yarraman, Blackbutt, Murgon and Imbil has provided sustained employment for a large number of people. These communities are very dependent on forestry for employment. The older plantations are now providing thinnings for sawmills established in the towns concerned and the time is near when the

oldest stands can be clear felled. The high yields from these clear fellings will not only create more employment in mills but also the areas cleared will help sustain employment of forestry workers on replanting.

During the year, a 55-year-old hoop pine plantation area was clear felled and replanted at Imbil to check on any problems which might arise in the second rotation. It is interesting to compare the total yield from the plantation with the original yield of natural hoop pine logged before the plantation was established.

Volume of natural hoop pine logged per hectare	100 m ³
Volume of plantation hoop pine logged per hectare—	
thinnings	325 m ³
clear felling	500 m ³
	825 m ³

Hence, the plantation over a period of 55 years has yielded more than eight times the volume per hectare yielded by the original natural hoop pine stand. Though not comparable in size with the logs from the natural forests grown over hundreds of years, the quality of the logs produced in the plantations was still nevertheless very high due to the Department's management techniques, particularly pruning.

Seed Collection: Collection of seed for the Department's planting programme is largely restricted to Honduras Caribbean pine, slash pine and hoop pine.

Due to the vigorous tree-breeding research programme carried out by the Department over the last forty years, tremendous improvement has been made in the quality of seed available and hence planting stock for the Department planting programmes. There is also considerable interest and demand from overseas countries to purchase the higher quality seed. During the year, 830 kilograms of Honduras Caribbean pine and 609 kilograms of slash pine seed were collected. This would be sufficient to produce 30 000 000 seedlings.

Seed collections were made from native forests mainly to satisfy overseas orders. There was particular interest in supplies of seed of brown salwood which is used for both fuel and wood production in tropical countries.

Amenity stock for planting as ornamentals, firebreaks and for erosion control are produced in the Department's amenity nurseries at Brisbane and Dalby for sale to the public. It is necessary to make periodic seed collections for a large number of both native and exotic ornamental tree species to satisfy the growing public demand for seedlings.

Nutrition: The soils, associated with the areas used for exotic pine plantations, are generally very infertile and deficient in many minerals. Attempts to convert the Wallum area to pasture for beef production have not been entirely successful due to the heavy dressings of fertilizers required to maintain the pasture. Nitrogen is readily leached from these sandy soils. The general tolerance of the exotic pines planted by the Department to the poor nutrient status of these sandy soils makes them an ideal tree crop species for this region and repeated heavy fertilizing is not required.



Mechanical tree shaker for seed collection.

Phosphorus is normally the only mineral which has to be added to produce satisfactory growth on deficient soils and its effect is long lasting. It has been found that exotic pines require a minimum level of phosphorus in the soil for satisfactory growth. Present practice is to apply about 60 kilograms of phosphorus per hectare with a broadcast application at time of planting.

Normally in southern Queensland where the bulk of the work has to be done, the fertilizer is applied aerially to those areas suitable for such application and manually in the remainder. This year, the type of manufactured superphosphate used in aerial application contained about twice the amount of phosphorus as that previously used, and considerable savings were effected through the lower application rate, freight, etc. A granular fertilizer must be used for aerial

application and must have at least 85 per cent with granules greater than one mm in diameter to minimize drift.

Nutritional research work undertaken has indicated that for various reasons some of the older plantings had not received a sufficient application of phosphorus at time of planting and a booster dose was both desirable and economically feasible. A total of 2 509 hectares of such areas was refertilized in the Tuan and Toolara area during 1978-79.

Research has also indicated that very localized areas are deficient in copper and a phosphorus copper nitrogen mixture is now applied routinely to these limited areas.

Weed Control: Control of competing weeds is essential in plantation management, particularly in young plantations. Due to the need to contain costs and improve effectiveness of work done, there is continuing research into weed control and techniques. Some of the avenues available for investigation include use of new herbicides, the use of new equipment, the introduction of pasture between rows, and varying the interval between thinnings.

In exotic pine plantations, mechanical cultivation is used to control weeds prior to planting. After planting, weed control is achieved by periodic cultivation supported by selective application of herbicides. Cultivation reduces the need for this application of herbicides and is therefore favoured.

In hoop pine plantations, the prospect of improved cost effectiveness and increased tree growth using improved herbicides and techniques is of the utmost importance and is an area of considerable trial work and research. This includes the application of persistent herbicides soon after planting to suppress weed germination and application of the herbicide glyphosate to the foliage of grasses and other established weeds. The use of controlled droplet applicators which will greatly reduce the cost of application and the arduous manual work involved is also being investigated. In addition, modified management practices are being applied to reduce the costs of necessary weed control. The adoption of longer intervals between successive thinnings of older plantations of hoop pine will reduce the need for control of lantana to provide access for thinning and perhaps aid more effective biological control.

Native Forests: Silvicultural operations in native forests are confined to the treatment of cypress pine and hardwood stands. The main centres for these operations are in Dalby and Warwick Districts where 9 886 hectares of cypress pine were treated.

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Unless dense cypress pine stands are thinned, they stagnate with negligible growth resulting. Once released, the trees respond extremely well.

Some of the funds provided by the Commonwealth Government to assist the State with employment of Aborigines were used in treatment of spotted gum stands, particularly in central Queensland near the Wooroobinda Mission. In all, a total of 13 433 hectares of cypress pine and eucalypt forest was treated in 1978-79.

GENERAL OPERATIONS

Fire Protection: The 1978-79 fire season was one of the mildest on record. Thirty-seven fires were reported throughout the State, six occurring in pine plantations, compared with the worst recorded year in 1968-69 when 440 fires were reported. This good result achieved was due in part to the mild winter and above average spring rainfall, but also to the level of preparation for the fire season.

The Department is fortunate in that the major exotic pine species used for plantation establishment are tolerant to low intensity fire, and prescribed burning is thus possible. This, however, is not the case with hoop pine plantations, and fire must be totally excluded from these.

Prescribed burning under mild seasonal and atmospheric conditions to reduce the level of forest fuel accumulation is now routine practice in exotic pine plantations and native hardwood forests.

To take maximum advantage of the limited periods during which weather conditions are suitable for prescribed burning native forest areas, aircraft are used to drop incendiary capsules in pre-determined patterns. Fixed-wing aircraft are used for most areas, but following trials in 1977, helicopters are now employed for prescribed burning in areas with difficult terrain or irregular boundaries. Burning of native forest areas is programmed on a rotational basis, varying according to forest type and fuel characteristics.

Prescribed burning of older plantations of slash and Honduras Caribbean pines was continued. Further trials were carried out in the less fire-resistant patula and radiata pines and interim guidelines for this work were developed. Trial use of a helicopter for the ignition of a slash pine plantation gave promising results.

During periods of extreme fire danger, areas which have been subject to prescribed burning may carry a low intensity mild fire, but this fire usually can be readily controlled. In most cases, the burnt area is a completely effective firebreak. Plantation burning is a technique which was developed in Queensland, while the native forest burning and aerial ignition techniques have been

adapted from similar work carried out elsewhere in Australia by C.S.I.R.O. Both practices represent important features in forest management.

Communications: The Department uses an extensive radio communication network as part of its protection system and has recently been allocated six V.H.F. frequencies in lieu of three previously used. Some areas had been subject to interference between stations and the use of six frequencies will reduce this problem significantly.

In western areas, V.H.F. radio has proved to have limited range. During the year, High Frequency Single Side Band (H.F.S.S.B.) transceivers were installed to improve communications over the long distances involved in the Roma Sub-District and in central and north Queensland.

Previous wildfires have demonstrated the importance of having an efficient communications network, and purchases of new transceivers during the year resulted in considerable progress in replacing old units and providing new installations associated with the change of frequencies.

Roads: Funds provided under the Roads Construction Vote are used to provide access to new areas of plantations being established, to upgrade existing roads in plantations subject to heavy timber traffic, as well as the construction of new access roads into virgin timber stands.

Considerable funds are also spent each year on the maintenance of roads which serve for the extraction of timber, fire protection purposes, silvicultural management and recreation. In north Queensland, which is frequently visited by cyclones, additional funds subsidized by the Commonwealth Government were spent on repairing flood damage to roads, bridges and drainage.

Funds were also provided under the Recreation Facilities—Construction Vote to improve roads and access to Forest Parks and along Forest Drives.

A feature of the road construction programme in 1978-79 was the bitumen sealing of logging roads in the Beerburrum area. In the older plantation areas, the main access roads are subject to very heavy log traffic. It is essential to pave the roads in these sandy areas to stand the heavy traffic and to provide all weather access. The availability of gravel is very limited and with the need to use crushed rock in place of gravel, bitumen surfacing was essential.

Mechanical Equipment: The Department's activities are heavily dependent on the use of various types of machinery. This machinery ranges from hand-held items such as chain saws, power misters and portable units, e.g. firefighting pumps, tractor attachments and implements to heavy plant items of rubber-tyred tractors, dozers, graders and associated field equipment, as well as motor vehicles.

Extensive development work has been undertaken by the Department on items of machinery to improve efficiency on the job and for the safety of operators. The need to reduce costs by the replacement of intensive manual work by cheaper mechanical operations or through improvement in design of attachments and the purchase of improved plant coming on to the market, has necessitated extensive work in design and evaluation. The purchase of the equipment also necessitates the preparation of designs and specifications.

Items of departmental plant which require constant upgrading of design to suit changing techniques and circumstances are, to name a few, planting machines, mounding ploughs, cultivators, clearing rakes and nursery equipment.

As part of the continuing programme of up-dating its fire-fighting capability, the Department is about to procure several new improved fire tankers and it was necessary during the year to design the specialized equipment to be fitted on to a five-tonne truck chassis.

Due to the need to improve the conditions under which men are transported to and from work, particularly on dusty roads, a demountable cab was designed to fit a standard truck body. Several of the units have been purchased and comments from staff have been very favourable.

Following research work done by the C.S.I.R.O. on the development of a pruner-head attached to a tractor, the Department carried out

trials on its use in exotic pine plantations. As a result of the trials, the Department has arranged to purchase a prototype unit for further detailed testing of its general suitability for high pruning work.

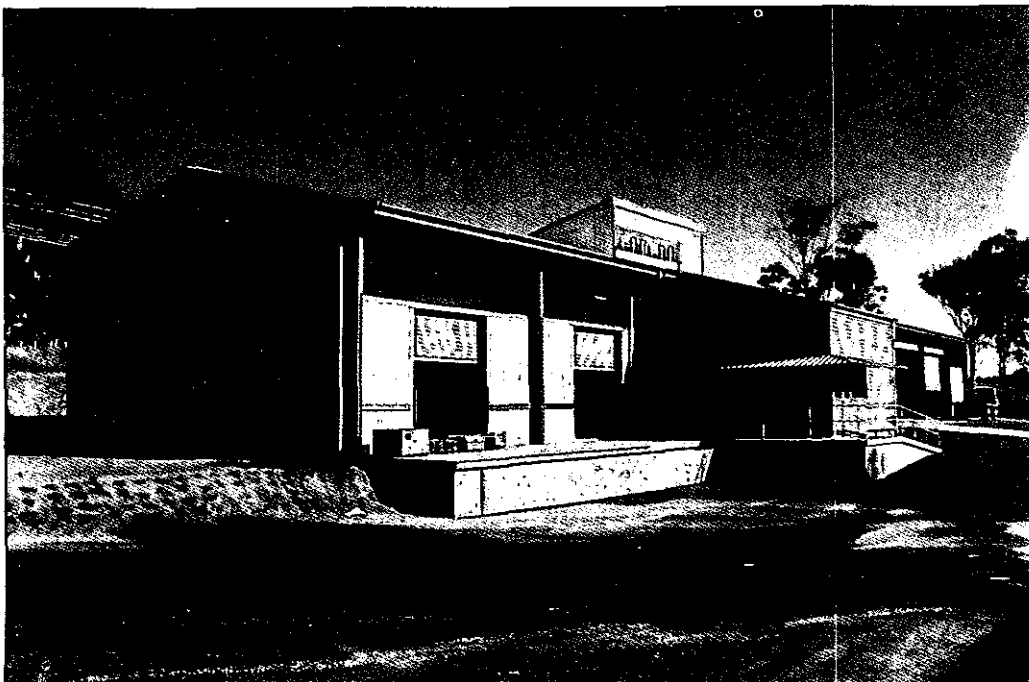
Expenditure on mechanical plant during the year was approximately \$1,410,000 and largely involved the replacement of 80 motor vehicles, seven rubber-tyred tractors and five crawler tractors. The Department's crawler tractor fleet and grader fleet have continued to reduce in numbers over the years due to the increased use of private contractors and the availability of more effective equipment.

Some expenditure was involved on the purchase of special items of equipment such as the two workshop cranes for the large departmental workshops at Maryborough and Gympie.

Preparations were made during the year for occupying the major new workshop constructed at Gympie for the repair of heavy equipment and motor vehicles.

Workshop staff and Plant Inspectors continued to receive technical training in repair and maintenance of several types of equipment at courses conducted by distributors of motor vehicles and heavy equipment.

Work was carried out on the development of a new computerized plant accounting system which is expected to be put into operation during 1979-80.



New Departmental workshops at Gympie.

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Capital Works: At Wongi State Forest near Maryborough, buildings for an office, garages and barracks accommodation to serve the new exotic pine plantation area were completed. The bulk of this work was carried out using contractors and labour from the Maryborough area.

Arrangements were finalized with the South-East Queensland Electricity Board for the supply of mains electricity to Jimna, and it is anticipated supply will be connected late in 1979. This installation will remove the necessity for the Department to provide electricity to the township of Jimna from its generating plant which will be disposed of. A supply of mains electricity was connected at Western Creek Forest Station in Dalby District.

Recreation: To cater for the increasing numbers who seek to relax and enjoy the beauty of our State Forests, the Department expanded its recreation development programme in 1978-79.

Visitors to the Gold Coast hinterland can enjoy the peaceful atmosphere of Numinbah State Forest Park constructed on the Nerang River. In the Fraser Island forests, picnic facilities are now available beside Lake McKenzie. At Wongi near Maryborough, Stony Creek at Byfield and Cedar Grove near Gympie, visitors can enjoy a variety

of delightful forest settings, from native eucalypt forest to cool, shady rainforest, in State Forest Parks established at these centres.

Forest Park camping facilities are now available at Emu Creek near Benarkin and Booloumba Creek near Kenilworth.

Facilities have also been improved at the popular Bunyaville State Forest Park on the outskirts of Brisbane and at the Charlie Moreland State Forest Park near Kenilworth. Usage of the Charlie Moreland Park was reported to be over 3 000 during last Easter. The Bunyaville Park is patronized by thousands of visitors from the metropolitan area picnicking with their families and other groups.

Wooroi Forest Drive near Noosa and Beerburum Forest Drive were both completed this year. Beerburum drive meanders through attractive exotic pine forests and includes Glasshouse Mountain State Forest Park with its captivating views over the coastal lowlands.

It is pleasing to see the high public use of the facilities provided by the Department and encourages the Department to seek increased funds to provide more facilities to overcome crowding and overuse of particular areas.

It is also heartening to report that vandalism of these facilities was on the decline.

Operational Statistics	1977-78	1978-79
*Total Forestry Development Fund Expenditure ..	†\$16,718,035	\$17,101,634
Average Wages Staff Levels	†904	842
Nursery Stock Produced for Plantation Establishment Purposes (number)—		
Hoop Pine—		
Container	1 413 000	856 000
Open Root	50 000	20 000
Caribbean Pines—		
Container	658 000	1 046 000
Open Root	1 172 000	1 042 000
Ocote Pine—		
Container	Nil	63 000
Slash Pine—		
Open Root	4 591 000	5 574 000
Radiata Pine—		
Container	Nil	Nil
Open Root	92 000	139 207
Loblolly Pine—		
Open Root	7 000	11 000
Patula Pine—Container	3 000	Nil
Eucalypts—Container	93 000	110 000
Plantation Establishment	6 620 ha	6 827 ha
Seedlings Sold—		
Number	421 064	418 261
Value	\$129,895	\$141,398
Seed Sold—		
Value	\$83,140	\$35,471
Seedlings Sold at Forest Plot Rates—		
Number	203 358	275 695
Weed Control—		
Native Pine Plantation	25 020 ha	22 549 ha
Exotic Pine Plantation	8 982 ha	11 695 ha
Fertilizing—		
New Areas Fertilized	5 366 ha	7 235 ha
Old Areas Refertilized	1 818 ha	2 509 ha
Pruning		
First	1 996 ha	1 632 ha
Second	2 710 ha	2 149 ha
Third	Nil	Nil
Native Forest Treated	18 983 ha	13 433 ha
Fire Protection—		
Areas Prescribed Burnt—		
Natural Forests	150 657 ha	58 074 ha
Exotic Plantations	9 777 ha	5 500 ha
Wild Fires Data—		
Number of Wild Fires—		
Size Class		
0- 4 ha.. .. .	77	17
5- 40 ha.. .. .	65	10
41- 400 ha.. .. .	70	8
401-4 000 ha.. .. .	42	2
4 001+ ha.. .. .	7	Nil
Area Burnt by Wild Fires—		
Size Class		
0- 4 ha.. .. .	66 ha	25 ha
5- 40 ha.. .. .	1 149 ha	265 ha
41- 400 ha.. .. .	10 606 ha	993 ha
401-4 000 ha.. .. .	49 760 ha	1 630 ha
4 001+ ha.. .. .	50 468 ha	Nil
Road Construction—		
Logging	87 km	42 km
Management	223 km	238 km
Operative Plant as at 30 June—		
Motor Vehicle and Trucks	469	459
Graders	25	23
Rubber-Tyred Tractors and Loaders	101	88
Crawler Dozers	53	49

*Excludes an amount of \$675,400, being a temporary advance from State Loan Funds to cover a delay in Commonwealth payment under the Softwood Agreement.

†Corrected figures.

5

Division of Marketing

This Division is responsible for the orderly marketing of forest products from State Forests, Timber Reserves and other Crown lands, including the maintenance of resource information so that sales can be related to the continued availability of all classes of timber.

HARVESTING AND MARKETING

Harvesting Operations: The volume of timber harvested from Crown and private lands during 1978-79 is shown in the Appendices.

The overall cut of timber, including pulpwood, from Crown lands during the year was 796 744 m³, a decline of 4.3 per cent from the record cut of the previous year. Compared with 1977-78, milling timber removals declined slightly and pulpwood removals declined by nearly 33 per cent.

The figures reflect a steady demand for sawn timber during the year, although the hardwood industry is still facing some difficulty in the marketing of certain products, and in the utilization of some of the more refractory species. The moratorium on the logging of small-size brush box has been continued.

While removals of native conifer pulpwood rose by 5 per cent, this was accompanied by a decline of 36 per cent in exotic conifer pulpwood and of 46 per cent in non-conifer pulpwood. These decreases reflect increasing usage of sawmill residues in the particle board and hardboard industries, rather than a further deterioration in the market for these products. Board production has remained almost static over the past two years.

The increasing use of sawmill residues for the manufacture of reconstituted boards leads to higher yields and more complete utilization of the produce from the forest. While this trend is encouraged in the long term, the immediate decline in removal of pulpwood has caused some delay in the application of first thinnings in exotic conifer plantations. Continuance of this trend would necessitate some amendment to current management practices to ensure that final crop production of high quality sawlogs and plylogs is not endangered.

Because of this decline in plantation pulpwood usage, the volume of plantation timbers produced fell marginally behind that of forest hardwoods, reversing the trend evident in recent years where plantation timbers comprised the greatest volume of any species group. However,

with the gradual decline in production from native forests evident over the past decade from Crown lands, and more particularly from private lands, this is a short-term effect. Greatly increased yields will become available shortly from the maturing plantation estate.

MARKETING PROCEDURES

Log Pricing: It has been the general policy to increase Crown log prices at intervals in accordance with the upward movement of the Consumer Price Index, in order to maintain the real value of timber revenues.

Because of the depressed economic situation and difficult trading conditions facing the industry, increases in Crown log stumpage becoming due on this basis since 1974 have been deferred.

While Departmental log prices were adjusted from 1st January, 1979, to take account of increased extraction and freight costs, no general increases in log stumpages were applied during the year. However, with improved trading conditions and greater stability in the industry, it is intended to increase Crown stumpages by 13.5 per cent from 1st July, 1979, incorporating the increase of 9.0 per cent in the Consumer Price Index for the 1978 calendar year, and 4.5 per cent of the accumulated backlog since 1974. It would be hoped that this recovery in the real value of log stumpages can be continued in future annual adjustments.

Gross Measure: The marketing of hardwood logs on a gross volume basis has now been in operation for over 12 months.

For hardwood logs, procedures were further simplified during the year by the elimination of half-rate factors which had been incorporated initially to facilitate the change-over from the net measure system. This has led to a better understanding and acceptance of the gross measure system by industry.

Whilst savings in the cost of marketing timber have accrued to the Department from gross measure, equally importantly the system has allowed the deployment of staff to other important areas in the marketing field, including more detailed resource assessment and the development of more efficient logging plans on sale areas.

Further simplification of marketing procedures and pricing structures is under investigation in liaison with industry bodies with the aim of further reducing administrative costs to the Department and to purchasers of Crown timber.



Feller-buncher in operation

Allocation of Crown Log Timber: Since the abandonment of regular auction sales in 1975, all naturally grown Crown log timber has been sold non-competitively on an allocation system to individual mills. This allocation system is based on allowable cuts which can be sustained from the forest.

Allocations for north Queensland rainforest timbers were revised during the year on the basis of the most recent inventories of the timber resource, and the allocations so determined will apply to mills for a three-year period from 1st October, 1978.

Preliminary work has also been undertaken to examine allocations of Crown hardwood and scrubwoods in south-east Queensland which are due for revision from 1st October, 1979.

Harvesting Studies: Based on studies conducted by the Plantation Harvesting Research Committee,

fifth row, plus selective bay thinning was introduced on a routine basis for the extraction of first pulpwood thinnings in coastal exotic pine plantations south of Maryborough. Adoption of this out-row system is at the purchaser's option, and is dependent on the payment of a stumpage surcharge to recoup the loss in high-pruned crop stems removed during thinning of the out-row. Further trials are planned to define more precisely the optimum intensity of out-row thinning in exotic pine plantations in terms of marking, measuring and extraction costs; comparisons are being made over a range of straight out-row removal, and out-row plus selection within bays.

In hoop pine plantations, investigations were commenced to determine the effect of various thinning intensities on harvesting costs. These trials are being duplicated in the Yarraman and Gympie districts.

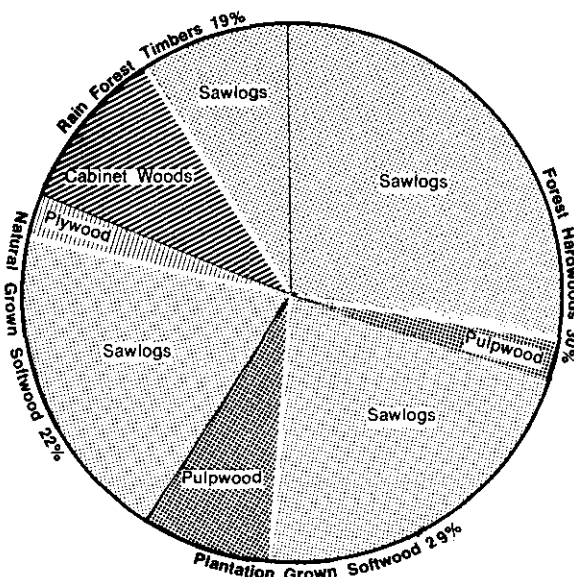
Miscellaneous Forest Products: The policy adopted by the Department last year for the salvaging of epiphytic plants from areas being cleared for plantation purposes has resulted in a further 130 per cent increase in sales to the general public; this amounts to a thirteen-fold increase since adoption of this policy.

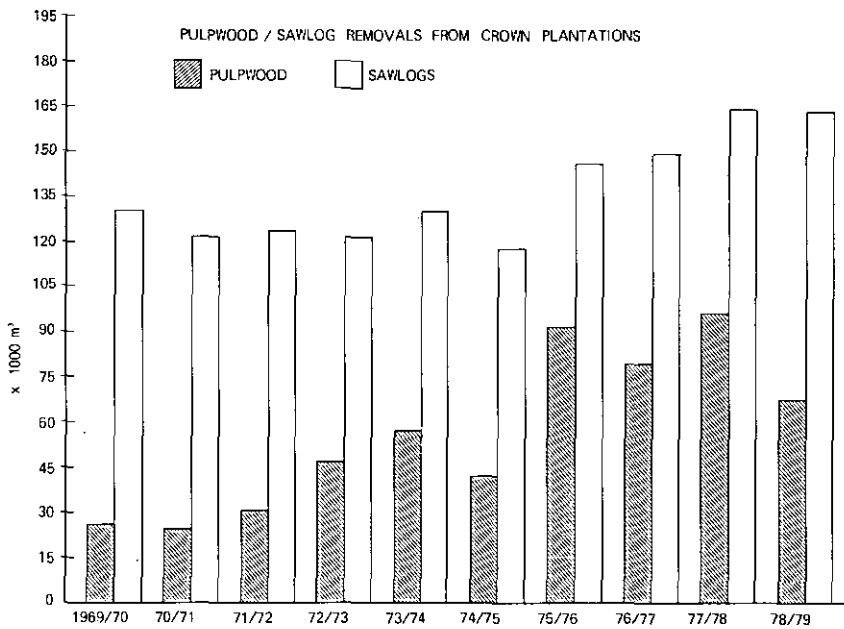
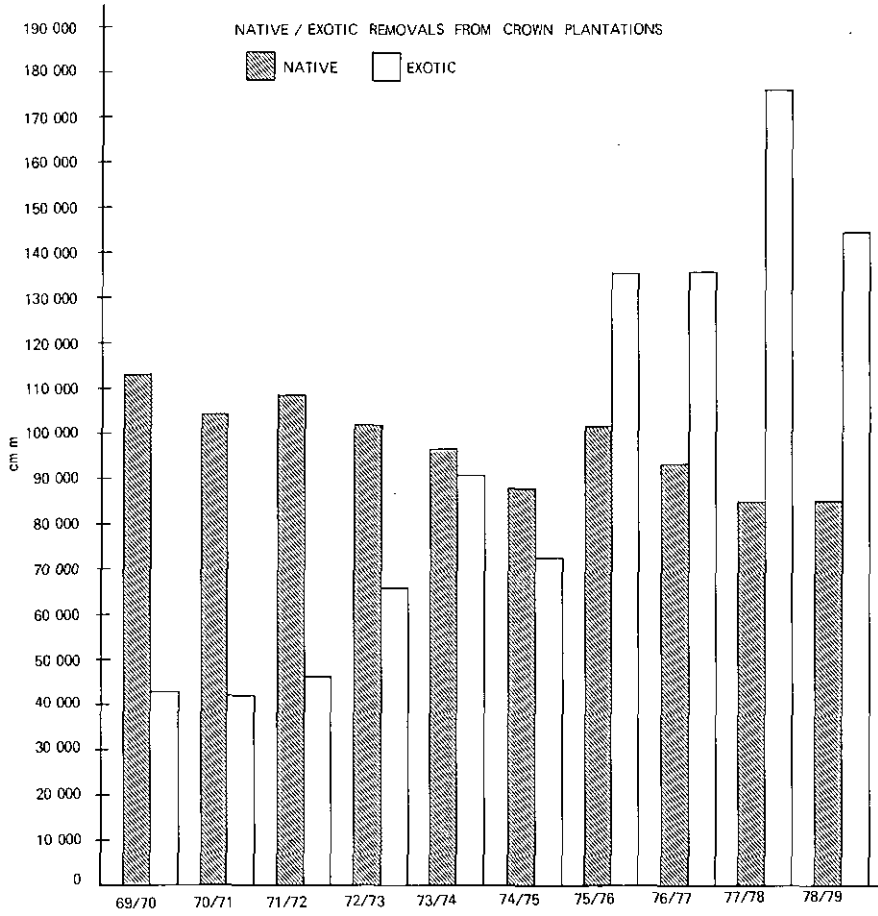
There have also been major increases in the sales of some other forest products this year. Pole sales rose by 47 per cent to 91 000 lineal metres from 62 000 lineal metres in the previous year. Sales of quarry material increased by 40 per cent to just over 700 000 cubic metres.

CROWN TIMBER REMOVALS 1978-79

TOTAL REMOVALS

796 744 m³





Sawmills Licensing: The number of licensed sawmills decreased by 14 during the year to 399; of these 316 were General Purpose Mills, 58 were Other Than General Purpose Mills and 25 were Portable Mills.

Other Than General Purpose Mills principally produce sleepers and similar specialized timbers.

Plants classified as Portable Mills are relatively sophisticated but transportable and the blade is moved by mechanical means through the log. These mills, depending on license conditions, may be used for the production of both scantlings and sleepers.

The Sawmilling Industry continued to take advantage of the Department's amalgamation policy which permits plants similarly classified and situated in their appropriate zones to amalgamate upon one site to enable more efficient operation. During the year, a further seven licenses were withdrawn following amalgamation with other licenses.

FOREST RESOURCES

Native Forest Inventory: During the year, a trial of a new inventory system was carried out. The system is based on a double-phase sampling design using a large number of sample points on aerial photos, with a sub-sample of these points located and established on the ground.

Analysis of the data collected from both the photo interpretation and field sampling is continuing.

In addition, two survey camps were engaged part time on inventory in native hardwood forests in the coastal and inland regions in the southern part of the State.

Further assessment of resources in north Queensland rain forests was commenced using a simplified inventory system.

Coniferous Plantation Inventory: Assessment of yields from plantations is a continuous process. Following assessment of young plantations for site index and stocking, permanent yield plots are established to monitor routine plantation growth. These plots are remeasured every five years. The growth data gathered from these permanent yield plots, supplemented by similar data from experimental plots, are used to update increment prediction models used in the plantation yield simulation programmes.

During the year, 2 090 hectares of young plantations were assessed for site index and 125 new yield plots established; 323 plots covering 6 460 hectares of older plantations were remeasured. About 3 205 hectares of plantations were stripped to obtain additional data on standing volume and size distribution.

In 1967, the plantation resources section developed one of the first workable yield simulation programmes in Australia. This programme, with further updating, has been used to carry out all subsequent routine yield calculations. By 1974-75, simulation technology had been developed to allow examination of plantation yields under varying thinning regimes and rotation ages. However, it was not until 1978 that adequate programming staff became available to turn this technology and associated systems into mass production programmes.

The major suite of programmes, while not yet fully operational, will allow a complete review of the State's plantation resources, and a detailed examination of a wide range of possible management options. This data will provide more precise information on current and future volumes available by various size classes for each particular product (pulpwood, sawlogs, plylogs, round timbers).

This project is of immense importance to the Department. It will facilitate decisions to be made on the future development and growth of all sections of the plantation timber industry in Queensland.

Valuation of Timber for Conversion of Tenure: There has been a modest increase this year in the number of applications for freeholding of Crown Land involving timber valuation. One hundred and sixteen applications were received in 1978-79 compared with 78 in 1977-78.

The overall situation is shown in the table below:—

	No.	Area (ha)
Applications being processed	86	330 626
Applications awaiting field assessment	136	540 458
Applications completed	3 355	10 520 646
Applications currently withdrawn	194	791 797
	<u>3 771</u>	<u>12 183 527</u>

6

Division of Planning

General: The Division is responsible for the initiation and co-ordination of planning, both short term and long term, for the Department as a whole. It has major concern in the financial fields of funding and budgeting and economic analysis of Departmental activities and alternative policies; in the environmental fields of land use studies, impact assessments and recreational use; and in public relations and education.

GENERAL PLANNING

Land Use and Environmental Studies: There were a number of inter-Departmental and Local Authority committees on land use and environmental studies to which the Department made important submissions:—

The Fraser Island Management Plan Committee;

The Rundle Oil Shale Proposal;

The Wide Bay-Burnett Regional Resources Survey;

The Pumicestone Passage Planning Committee;

The Queensland Resources Atlas.

In addition, comments were provided on major Environmental Impact Statements covering the Farnborough Resort Project near Yeppoon and the Queensland Cement and Lime Company's new plant near Gladstone.

Interim listings of the National Estate Register have been kept under review and the Australian Heritage Commission has been advised on those proposals affecting State Forests and other lands of interest to the Department.

In connection with the Brisbane Forest Park, the Department as the major landholder in the Park area, submitted a draft Forest Management Plan to the Park Advisory Board. This plan sets possible silvicultural and logging guidelines for the future management of the State Forests within the Park.

There has been a considerable increase in the number of applications for permits to collect biological material for scientific purposes. A total of 54 permits was issued, including 11 for inter-state or overseas research workers, compared with a total of 18 in the previous year. The range of fields studied reflects the considerable value of State Forests as research resources. Collections of particular interest were for comparative studies of vegetation remnants in Aboriginal cave sites, and for a revision of a definitive key for an insect genus.

There has also been a substantial increase in advice sought by the public on environmental and land use matters affecting forests in general, including recreational aspects.

Planning Projects: Work continued on two major projects during the year and a further two major projects were commenced, as follows:—

The Hoop Pine Plantability Study was completed during the year and a report is under consideration.

The Pruning Study is nearing completion. This study is looking at the future demand for high quality clear wood, the economics of its production and the operational methods involved.

The Exotic Pine Planting Programme Study is a new project and will review the expected demand for this type of material, the availability of planting land, and the likely funding for the programme.

The Exotic Pine Espacement Study is another new project and will determine, by using cost benefit analysis, the optimal spacing to be adopted at the various major exotic plantation centres.

Survey and Mapping: The effectiveness of any survey and mapping work is necessarily very dependent on accurate survey control to form a network on which aerial and ground surveys can be based. To ensure this control, the Department purchased during the year an Electronic Distance Measuring Unit with an effective range of 6 kilometres. This instrument will also speed up this type of survey work.

A total of 16 survey parties operated during the year, and seven Forest Entitlement Area boundaries were surveyed for lodgment of plans with the Department of Mapping and Surveying.

Relocation of the Department in new premises provided an opportunity to update mapping equipment. A rescaling camera was purchased and will assist greatly in mapping and graphic art work. The air-conditioned work environment has created stable conditions for mapping work and in general the new accommodation allows the section to operate more efficiently than previously.

Training courses were held at the Gympie Training and Conference Centre in field operations for mapping staff and in photogrammetry for field staff.



Electronic Distance Measuring Equipment recently purchased by the Department for use by survey staff.

Sheet mapping in North Queensland and Dalby Districts continued. The revision of management maps is a continuous function.

Small format photography work continued, and two 35 mm cameras were purchased to install in aircraft operating from Maryborough and Ingham.

Work on infra red and 70 mm aerial photography was commenced. Twelve flights and 166 interpretations were made.

Throughout the year, 1965 maps valued at \$5,107 were sold to the public or to other Government Departments.

MANAGEMENT SERVICES

The major focus during the year was on developing managerial and supervisory skills amongst middle and lower level managers. A

total of 95 staff have now attended a two-week development programme and another 121 have attended a one-week programme.

Involvement with the Public Service Board Management Improvement Programme has continued and a further 16 staff participated during the year, bringing the total to 53.

The Department's Development Programme has been actively continued with the redesign of the Head Office records system, a workshop for clerical staff, receptionist courses and a more up to date induction kit for new appointees.

In addition, a major review of all Forest Ranger positions in the State has been carried out, with a view to ensuring work value relativity and providing a realistic career progression through the non-professional ranks.

ECONOMICS

Economic Conditions: While the availability of timber from private lands continued to decline, milling timber removals from Crown land proceeded at a level only slightly below last year's record cut.

Coinciding with this continuing high level of timber removals was a further improvement in the building industry, with dwelling approvals in 1978-79 reaching the highest level since 1973-74.

A similar pattern was evident in new dwelling commencements and completions.

For the first nine months of 1978-79, overseas imports of timber appeared to be running at about the level of 1977-78, but again were well down on the high levels of 1976-77. A most significant feature was the increase in Douglas fir imports. Imports of South East Asian timbers were down on previous years and this is attributed to rising prices brought about by increased competition from North America and Japan.

With respect to prices, the year 1978-79 proved little different from recent years. Costs continued to rise faster than the prices for some goods and services provided by the Department. Wage rates increased by some 6.5 per cent during the year while the general level of prices as measured by the Consumer Price Index (all groups—Brisbane) rose by 8.2 per cent. At the same time, stumpage prices increased by slightly more than 2 per cent as a result of log price adjustments for freight costs. There was, however, no general increase in log stumpages.

Availability of Funds. Funds made available to the Department from all sources totalled \$36.6 million in 1978-79 and represented an increase of 9.1 per cent over the amount provided in 1977-78. Details of the various sources of funds and their application are presented in Appendix 14.

Funds from Consolidated Revenue rose by 16.5 per cent to \$9.8 million, the major proportion of which is required for salaries and related administrative expenditure. A major component of the increase in funding was a special allocation of \$648,000 for the eradication of the West Indian termite or just under \$500,000 more than that provided in 1977-78.

The Forestry and Lumbering Fund, which is financed mainly from the Department's timber sales activities, increased by 7.5 per cent to \$8.6 million. These funds were used to finance expenditure on harvesting and marketing operations, maintenance of roads and capital improvements and interest payments.

The allocation from State Loan Fund, the main source of finance for the Department's forestry development programme, rose by 6.4 per cent to just over \$15.1 million or less than the increase in the Consumer Price Index. Nevertheless, most targets adopted for the forestry development programme were achieved during the year, partly because of improved techniques and further rationalization of operations and partly because of

- (i) a special grant of \$500,000 for maintenance of employment;
- (ii) an increase of \$100,000 over the amount received in the previous year for employment of displaced sand-mining employees from Fraser Island.

The agreement between the Queensland and Commonwealth Governments for continued financial assistance under the *Softwood Forestry Agreements Act 1978* was finalized during the year. This financial assistance applies to the period from 1977-78 to 1981-82 and will be restricted to the maintenance of plantations established by the Commonwealth under previous agreements.

The level of assistance in each year of the agreement will be based on actual costs incurred in maintaining the plantations. However, in 1977-78, a ceiling of \$675,400 was specified. The amount advanced in 1978-79 was \$810,000.

The Softwood Forestry Agreements Acts have had a major impact on the softwood planting programme in Queensland. They have permitted the Department to expand its annual planting programme to a level considered necessary to meet the State's future timber requirements. In the 11-year period from 1966-67 to 1976-77, when the Commonwealth provided financial assistance for new plantings, a further 58 544 hectares of softwood plantations were established. Of this, 15 959 hectares (or just over one-third) were funded under the Agreements.

Economic Studies: A preliminary report on Queensland's future timber requirements (other than pulpwood) was completed during the year and is being used as a basis of several projects currently in progress. Log timber requirements are anticipated to rise steadily, increasing by about 50 per cent above current levels in 30 years' time.



Part of Bellbird Grove in the Brisbane Forest Park.

A financial analysis of the Department's softwood planting programme was also undertaken. Provided that stumpage prices are adjusted according to movements in the consumer price index, the current planting programme should be capable of repaying interest and redemption charges in full and make a net contribution to State revenue as the plantations reach maturity.

A preliminary analysis of the economics of the hoop pine planting programme indicates that the most profitable time to clearfall hoop pine plantations is about 50 years after planting. However, this is influenced by several factors such as the interest rate, thinning regime, stumpage prices and site index.

A submission was prepared for the Inquiry into "All aspects of Australia's Forestry and Forest Products Industries" currently being carried out by the Senate Standing Committee on Trade and Commerce.

ORGANIZATIONAL SERVICES

Public Relations: Following the success of last year's public open day, similar functions were held this year at Beerwah, Bundaberg, Atherton and Maryborough. All were well attended with hundreds of people enjoying the educational and recreational features of the forest at the various centres.

This year the Department also had increased participation at country shows with displays at Inglewood, Warwick, Toowoomba, Dalby, Roma, Chinchilla, Murgon, Nanango, Kilcoy, Crow's Nest, Gympie, Rockhampton, Mackay, Townsville, Cairns, Atherton and Monto as well as the R.N.A.

Publications: Information sheets continue to be the main public-orientated brochures, providing information for students and the public. Topics cover a range of forest management and related topics.

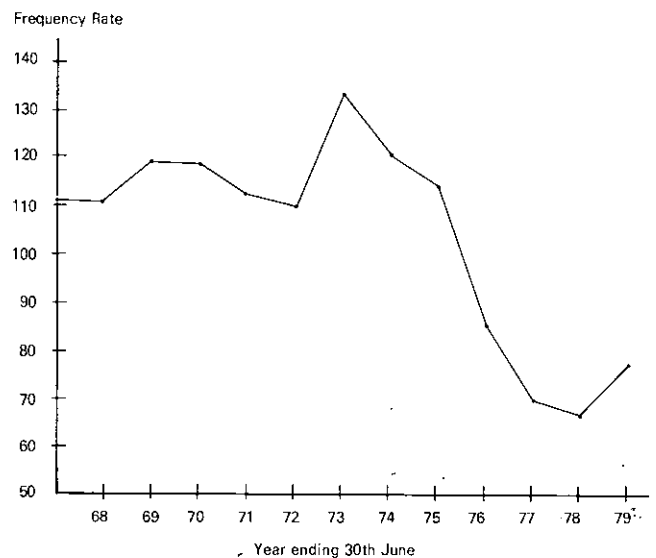
Three new Forest Drive brochures—Yarraman, Benarkin and Wooroi Forest Drives—were printed.

A summary of all the publications produced by the Department during the year is listed in the Appendices.

Recreation: Surveys conducted during the year have indicated that approximately 350 000 people are visiting developed State Forest Parks each year to enjoy activities ranging from an afternoon picnic to a week-end camping trip. It is estimated that a similar number of visitors also use other areas of State Forests for bushwalking, jogging, horseriding and other forms of recreation.

The sign system developed jointly by this Department and the National Parks and Wildlife Service was completed during the year and will soon be introduced throughout the State.

A recreation school held in August was attended by thirty staff involved in recreation work. This training, together with the implementation of a planning framework, has greatly improved the quality of recreation work and allowed priorities for development to be assessed.



During the year, visitor surveys of Fraser Island were conducted by the Department with the co-operation of other bodies, and the results were used by the Committee charged with developing a Management Plan for Fraser Island.

The first recreation development in the Brisbane Forest Park was undertaken during the year at Bellbird Grove, and Departmental staff were wholly responsible for the planning and carrying out of this project.

Job Safety: It is disappointing to report an upturn in the Lost Time Injury Frequency Rate this year after a continuous decrease in the rate since the peak period of 1972-73. The rate this year was 77.8 compared to 66.7 in 1977-78.

Types of injuries occurring are similar to those of previous years and no single factor can be identified as a probable cause for this upturn.

The graph shows the Lost Time Injury Frequency Rate since 1967 and illustrates the substantial improvement achieved.

While the overall frequency rate has risen this year, five districts have recorded continuing decreases since 1975.



Camping on State Forest



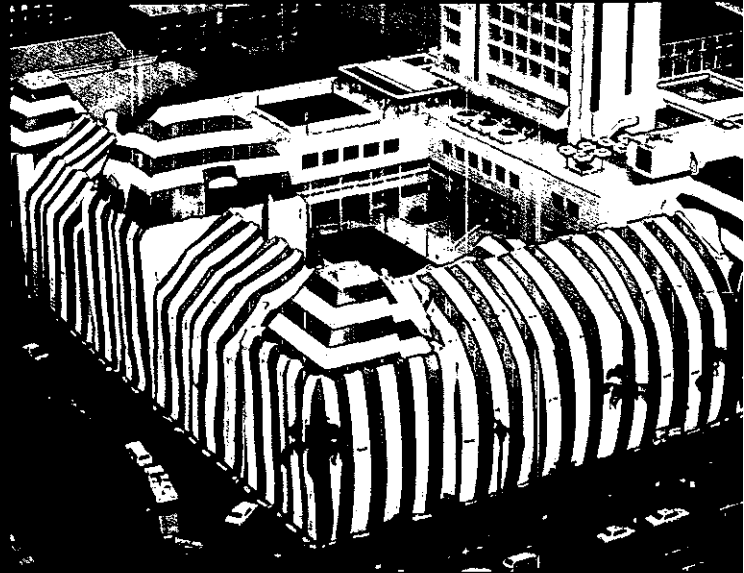
Cedar Grove State Forest Park



Berburum Exotic Pine Plantation



Personell Carrier



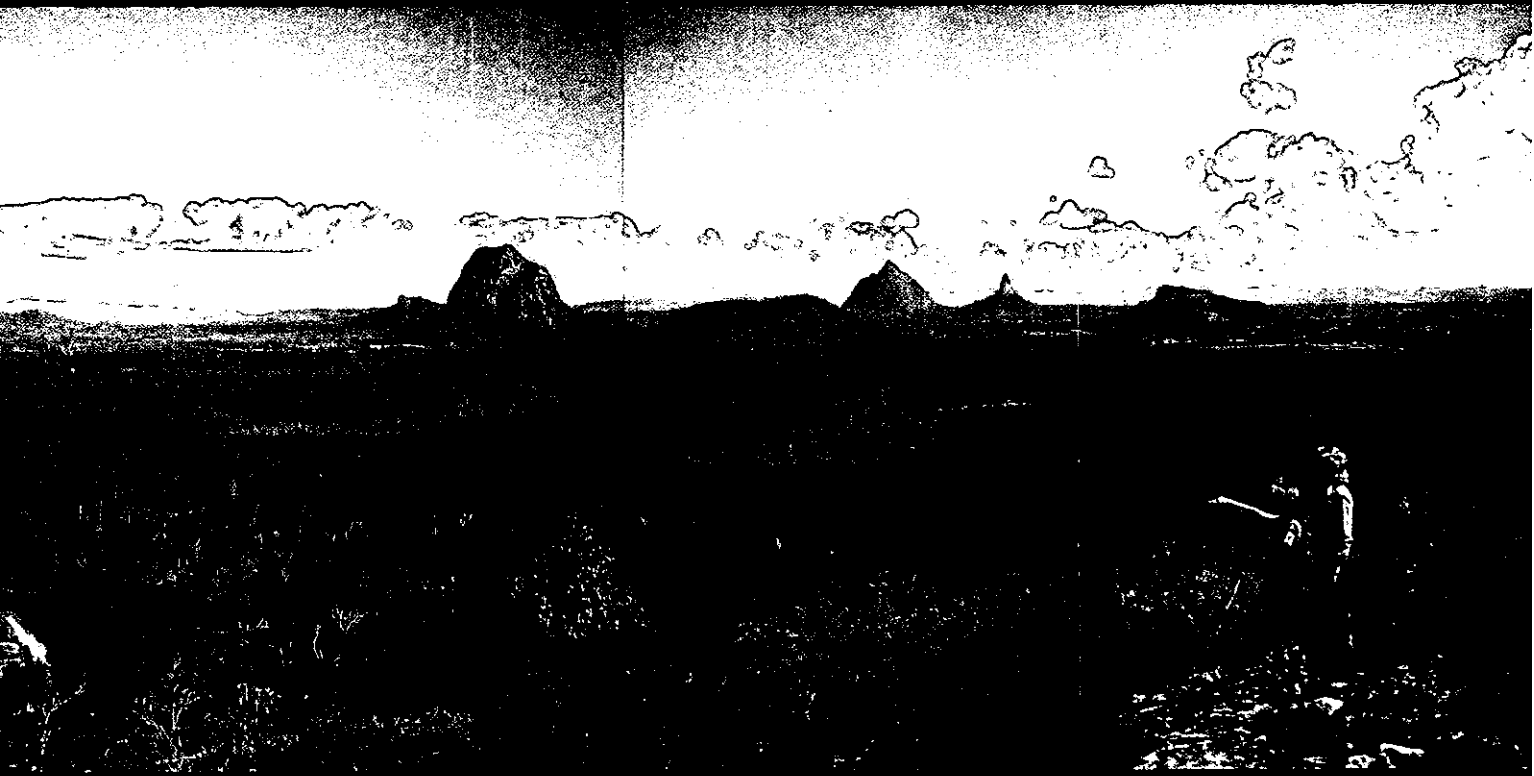
Fumigation for West Indian Drywood Termite



abil Forest Drive



Boolumba State Forest Park



butt of large Red Cedar



Prescribed Burning

6

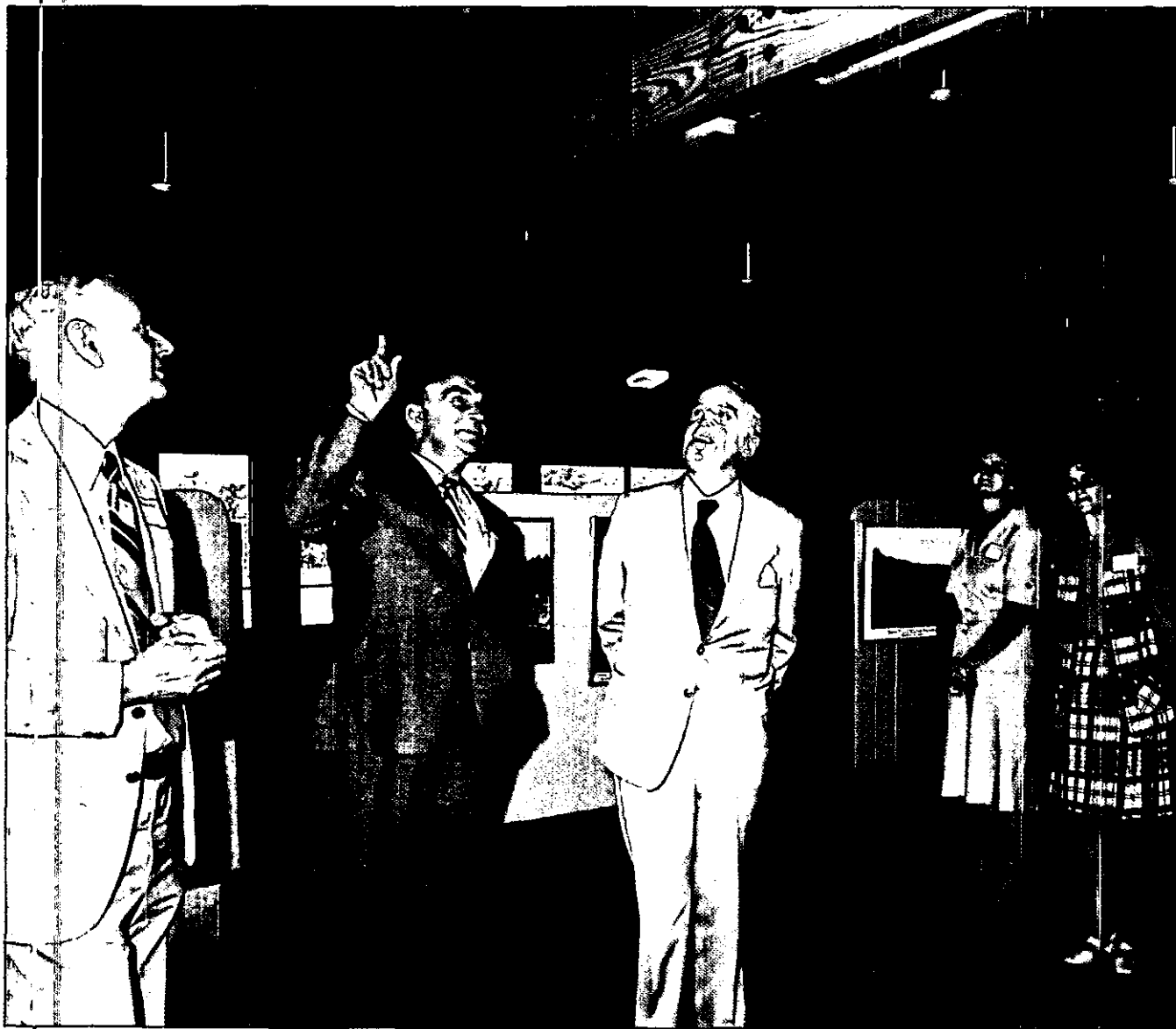
In the competition for the Safety Shield, Rockhampton District won the Minister's Shield for the lowest frequency rate with a very creditable Lost Time Injury Frequency Rate of 35.58, and Warwick District has won the Conservator's Shield for the most improved rate with a 59.3 per cent improvement. Both Districts have recorded annual improvements in their frequency rates since 1975 and are to be congratulated on their winning of the respective shields.

Three other Districts, North Queensland, Dalby and Murgon are to be commended for sustaining decreases in injury frequency rates.

Whilst a number of staff changes have taken place during the year, the continued commitment and enthusiasm of all staff to the Safety Programme will ensure continued gains in this most important aspect of the Department's activities.

FORESTRY TRAINING AND CONFERENCE CENTRE—GYMPIE

The Training Centre was officially opened on 15th September by the Honourable J. Bjelke-Petersen, Premier of Queensland. Even before this event, the Centre had evoked considerable local interest to the extent that it is now regarded with a sense of community ownership.



The Premier of Queensland, the Honourable J. Bjelke-Petersen M.L.A., at the official opening of the Forestry Training and Conference Centre, Gympie.

Twenty school leavers were appointed in February 1979 to begin training as field supervisors. After a week's orientation course, they began a five-month field training programme to determine their suitability for the work environment. Their formal instruction at the Centre begins in August, 1979.

A wide variety of Departmental in-service training courses has been conducted throughout the year. This training covered areas such as managerial development, weed control, photogrammetry, fire control and advanced statistics. A major routine-research conference was also

held at the Centre. In all, 770 Departmental staff passed through the Centre.

A high degree of interest has been shown by outside organizations in using the Centre's facilities for their own training programmes. The demand has varied from whole week live-in type courses organized by the Public Service Board, to half- and one-day seminars for school principals and various business concerns. An additional 415 people from external organizations have passed through the Centre, with many commenting favourably upon the value of the facilities for training purposes.

Division of Technical Services

The Division is responsible for research associated with the management of State-owned production forests and the use of forest products. There is considerable liaison with the conversion industry and extension services are available to the tree grower and wood user. An important decentralization development during the year was the posting of an officer to Rockhampton with responsibility to advise on timber utilization in central Queensland.

Research Report No. 1 (1977) giving a detailed coverage of research activities was issued during the year. It is proposed this be a biennial publication with the second report scheduled for late 1979. A routine-research conference covering establishment and early management of Caribbean pine plantations was held in November. Valuable feedback and discussion between forest manager and research worker resulted in considerable agreement on the most desirable management practices and areas for further research.

The year saw increasing liaison between Departmental researchers and those of other organizations. Close contact has been established with the newly-created Southern Queensland Regional Station, Division of Forest Research, C.S.I.R.O. at Brisbane and has been maintained with the Queensland Regional Station at Atherton and other C.S.I.R.O. Divisions. The Division is appreciative of assistance given by officers of the Department of Primary Industries in crop rotation work in the Toolara nursery, pasture establishment in young hoop pine plantations and in eucalypt forests and soil conservation procedures in exotic plantations.

Rural Credits Development Fund grants were made available by the Reserve Bank of Australia during the year for university-supervised work on nutrient cycling in wet sclerophyll forests of Fraser Island and vegetative reproduction in hoop and Caribbean pines. The Officer in Charge of Tree Breeding in the Department undertook an F.A.O. consultancy on co-operative international tree improvement programmes with tropical conifers.

FOREST RESEARCH

During the year, construction of the Gympie regional research station was commenced. Completion of this building will allow the relocation of the bulk of Forest Research Branch staff now stationed at Beerwah, Yarraman, Imbil and Gympie.

A research school was conducted to co-ordinate measure techniques, general reporting on experiments, publications, etc., among the various research stations.

Coniferous Plantation Silviculture: The development of open-root planting stock for hoop pine has been under intensive investigation. Although some successes were achieved, the open-root technique has proven unreliable over a range of planting conditions. The thrust for nursery research now is to develop containerized one-year planting stock for hoop pine. Biological and economic advantages over the existing technique may be possible.

Investigation of new materials and techniques for the control of competing weeds in hoop pine plantations is a continuing process. Residual weedicides are being tested in the establishment phase. Several of these display excellent weed control. Experimental sowings of pasture and legumes at planting show promise for early weed control. However, many grasses severely suppress hoop pine and refinement of pasture management



Artificial pollination in Imbil hoop pine seed orchard. This continues to be essential for the production of fertile seed.

techniques is required. Fosamine has been shown to be more effective than 2,4-D in controlling lantana. Further research to determine the optimum season of application and concentration is in progress.

A comprehensive set of species trials attempted to define suitable species for marginal hoop pine areas—frost sites, black clay flats and transition forest types. The trials involved some twenty exotic pine species. No species has proved satisfactory in the upland hoop pine areas. Plantings of loblolly pine on creek flats are viable in the Mary Valley. Other problem areas will probably have to be excluded in the second rotation.

An increased proportion of Departmental sowing of Honduras Caribbean pine, coupled with increasing seed sales to overseas countries has led to accelerated research into the processing of Honduras Caribbean pine seed. It has been found that mechanical dewinging, considered safe for slash pine, damages the seed coat of Honduras Caribbean pine and markedly reduces germinability after one year in storage.

Kiln drying of cones for 20 hours at 45°C after air drying for three to six weeks does not affect the germinability of Honduras Caribbean pine seed. However, where cones are slow to open, seed recovery is better if six weeks preliminary air drying is allowed.

Provided storage is kept airtight, Honduras Caribbean pine seedlings can be cold stored at 2°C for up to 64 days without loss of field survival. If suitable packaging techniques for large scale cold storage can be developed, real possibilities exist for overcoming the vagaries of planting conditions and for rationalizing nursery establishment through the introduction of long distance transport.

Screening of herbicides for selectivity to cover both nursery and field conditions continues. Pot trials indicate that chlorthal plus propazine can be applied to control weeds as they germinate without harming 12-week-old seedlings of slash pine and Honduras Caribbean pine. Caragard also shows promise as a post-emergence herbicide.

Unlike radiata pine, slash pine has a fairly low tolerance to hexazinone and Honduras Caribbean pine has none at rates likely to control weeds in exotic pine plantations. Although selective control of weeds in slash or Honduras Caribbean pine plantations is not possible, trials using directed sprays are very promising.

A review of thinning trials in Honduras Caribbean pine stands aged between 21 and 27 years indicates that early pre-commercial thinning to stockings as low as 750 stems per hectare reduces total merchantable volume production slightly.

However, it results in a substantial increase in value production because of increased stem size.

Trials comparing row thinning by tree harvester with traditional selective thinning show that where thinning is to similar standing basal area levels, no significant volume production loss is sustained up to three years after thinning.

Native Forest Silviculture: Experiments testing different fertilizer levels on enrichment planted blackbutt on Fraser Island indicate that 200 gm/tree of fertilizer with an NPK ratio of 10:3.9:6.1 produce better height growth 18 months after planting than 100 gm/tree of the same fertilizer. Several pelleted fertilizers with lower levels of N and P were no better than nil application. Another experiment indicated that Fraser Island provenance was superior to a mainland provenance, 6 cm jiffy pots were superior to 4 cm jiffy pots, while most rapid diameter growth of enrichment planted stock occurred when all overwood stems were removed immediately after planting.

Results of enrichment planting trials on the mainland show that enrichment planting with blackbutt or Gympie messmate has improved stocking and productivity in logged blackbutt, white mahogany and mixed hardwood forests. Treatment with 57 gm/tree of fertilizer with an NPK ratio of 3:15:3 has not improved height growth; 6 cm jiffy pots have proved to be the best containers for enrichment planting.

The gathering of information for a study of the short-term diameter growth patterns of cypress pine stems over a range of size classes throughout the zone of occurrence of the species has been completed. Data were collected from Western Creek, Barakula, Yuleba, Pony Hills and Hillside using stainless steel dendrometer bands for accurate diameter measurement. Limited height growth records were collected by measurement from a base of fixed height. The data will now be analysed to determine the season of growth of cypress pine and to relate short-term diameter fluctuations to prevailing seasonal and climatic conditions.

A general remeasure of 46 cypress pine Detailed Yield Plots at Barakula during the year will add to the data base from which growth rates, used in the management of the forest, are determined.

Studies continue into the regeneration of cypress pine areas devastated by wildfire. An area burnt in December, 1976, at Bringalily (near Inglewood), is being used to study the amount and growth rate of natural regeneration of cypress pine following wildfires.

Some 200 "single tree" growth plots sampling the pre- and post-merchantable size classes of spotted gum were established on Ballon State



Forest. These circular plots have a subject stem of the required size at the centre and are designed to yield accurate growth data for spotted gum on western forests. Information on species associations and densities, soil types, and other site factors was collected at each plot and will be used to help to explain the growth of spotted gum.

Some of the records collected also will be added to a data bank which will be used in competition index studies, initially restricted to spotted gum.

Logging damage studies continue as a major avenue of rainforest research. They are taking on a new significance in monitoring the residual stand on re-cut areas. These areas will be called on to supply an increasing proportion of the total rainforest yield, and it is important to ensure their continuing ability to do so without unduly lowering the quality of the timber produced. Indications are that a tighter control of all phases of management, including initial assessment, pre-logging marking, felling and extraction may be desirable.

As an adjunct to this work, other studies are monitoring the rate of spread of degrade in the standing tree. They will be used to indicate what levels of damage can be tolerated in trees that have been marked for a future logging.

Further increment and yield data are being obtained from the areas used for studying logging damage. The data are based on an unbiased relascope selection of trees throughout each study area, and will indicate stand variables and increment for the condition of any particular area. With discrete area plots this is very difficult to achieve.

Notwithstanding the possibility of bias, a considerable effort is being made to get all old experimental and yield plots in rainforest, suitably analysed by computer. This is nearing completion for experimental series involving enrichment planting and yield plots.

Research staff were active, both with advice and field assistance, in a Forest Inventory Survey trial of rainforest assessment.

Tree Breeding: Two sections of the Honduras Caribbean pine clonal seed orchard at Kennedy in north Queensland, which was established progressively between 1968 and 1975, were thinned after seed fall early in 1979. Greater crown space was provided for the best ramets of the clones with superior combining ability based on progeny tests. This will result in temporarily reduced cone yields in the two sections culled in this way, but increasing yields of the younger sections will partially compensate. The culled sections were also fertilized.

A review of all plus trees was commenced in preparation for extensive field grafting in new orchards (see Annual Report of 1978) and clonal

banks to begin in 1979–80. Many second-generation selections, of fully or partially known pedigree, are now included in the breeding population.

Assessments in progeny trials continue on schedule, and they confirm that large gains are being realized in stem straightness and wind firmness, but conspicuous gains in growth rate are not expected until orchards are culled or reconstituted to comprise clones combining high breeding values for growth and stem quality.

An extensive seedling seed orchard of 25 hectares using bulked progeny from 70 selected families was planted at Cardwell as an extra source of improved seed incorporating a number of good families whose parents are not included in clonal seed orchards because of stock-scion incompatibility.

Trials were commenced of a narcotting (air-layering) technique for the propagation of incompatible parents.

Assessments were carried out at age 5.5 years in the several plantings of the provenance trials in the international series being coordinated by C.F.I., Oxford. Preliminary results indicate no important interaction of provenances with planting sites which range widely in soil fertility, drainage and climatic conditions between about 18 and 27 degrees S. latitude. Of particular interest is that several "new" provenances are displaying promising performance indicating it is desirable to broaden the local genetic base, of predominantly Belize, Mountain Pine Ridge origin, with selected material from the best of the recent introductions. Consideration is being given to the most effective procedures for achieving such a broadening of the advanced local breeding population without undue dilution of it.

F₂ hybrids of slash and Honduras Caribbean pines continue to show promising performance on swampy sites in south Queensland. Small clonal orchards established in the early 1970's to produce F₁, F₂ and backcross hybrid seed are now regularly producing small yields, 10 kilograms or so per year, and the stock are being performance tested in operational plantings on swampy sites in south Queensland. Plans are being developed for the establishment of a larger clonal orchard to produce F₂ seed.

Ten hoop pine progeny trials planted between 1963–64 and 1969–70 were reviewed. They involved more than 200 families from 70 phenotypically selected plus trees. In all ten trials, the families from selected parents showed significant and marked superiority in stem straightness compared to control stock; such superiority for growth rate was less consistent, but always there was a proportion of families clearly superior to control stock. It was concluded that the stock derived

from the two existing clonal seed orchards, which have produced small to moderate yields, can be expected to display conspicuously superior stem form and, on average, a small gain in growth rate.

Action is being taken to cull inferior clones and to increase pollen availability in the orchards through cultural techniques, such as thinning, weeding and fertilizing, and supplemental mass pollination (see Annual Report for 1978). The review of these progeny trials led to the identification of some outstanding full-sib and half-sib families, the best ones giving respectively, 90 per cent and 50 per cent greater volume per tree at age 10 years than the comparable routine control stock, as well as conspicuous gains in tree quality. The discovery of many such outstanding families has led to mass pollination of certain clones in the orchards and appropriate pollen sources.

A third clonal seed orchard is to be established subject to satisfactory completion of a feasibility study. The opportunity to increase genetic gains still further through mass vegetative propagation of only the best available 50 or so trees each year, for a total of many hundreds of selected trees, is attractive. Research on this and other problems of vegetative propagation has commenced in co-operation with the University of Queensland Botany Department using funds provided for two years by the Rural Credits Development Fund.

Forest Soils and Nutrition: Research into the nutritional requirements of southern pines on ground water podzols in the Maryborough/Gympie Districts has resulted in adoption by Division of Operations of fertilizing with phosphorus, nitrogen and copper to these sites. Current research is aimed at defining more closely the optimum levels of nitrogen and copper and the method of application of copper. Copper deficiency manifests itself as gross twisting of stems and branches and needle necrosis, resulting in the tree becoming unmerchantable.

The fertilizing of older southern pine plantations is being preceded by a foliar nutrient survey aimed at delineating deficient areas and major limiting nutrients. This programme is based on research findings that some of these plantations suffer deficiencies of phosphorus, nitrogen, copper and zinc. Regression modelling has indicated that better growth of Caribbean pine is associated with improved levels of phosphorus, nitrogen, sulphur, zinc and boron. Further experimentation was initiated during the year at Beerwah, Toolara and Tuan aimed at defining the level and economics of response to refertilizing following first thinning with those nutrients known to be in short supply.

Pot trials have indicated that phosphorus and potassium are limiting for Caribbean pine on a

series of outwash soils at Bayfield. This is the first instance of major deficiency of potassium recorded for this species in Queensland, and confirms results from field trials up to five years old that multiple deficiencies will need to be overcome if plantations are to be successfully established in this area. Another marginal area under study is Wongi near Maryborough where early growth responses to site preparation and fertilizing are promising; pot trials are current to better elucidate the nutritional problems of this area and a series of trial plantings aged six years and showing various symptoms of stress were foliar sampled this winter to check on their nutrient status.

Management of nursery fertility by use of mineral fertilizers and cover cropping is the subject of intensive investigation. A crop logging system has been initiated this year for major southern pine nurseries at Beerburrum and Toolara in order to ensure optimum nutrition of the developing crop; base line data for this monitoring has been prepared. Further work on legume cover crops is also current at Toolara to develop optimum crop rotation procedures aimed at ensuring maintenance of long term nursery fertility and productivity. Extensive sampling was also undertaken in connection with nursery extensions at Beerburrum and proposed new nurseries near Bundaberg and Ingham.

Second rotation studies in hoop pine were commenced at Imbil during the year. Biomass and nutrient content of these 40-year old first rotation stands were estimated prior to clear felling so that nutrient removals in logging and those retained on the site could be assessed. Site preparation treatments involving various burning and disturbance regimes are under test and nitrogen fertilizer trials have been established in the second rotation stands. Second rotation patula pine sites at Pechey have also been replanted to a range of *Pinus* species and several fertilizer treatments applied with the aim of determining the most productive species/fertilizer regime for replant areas.

During the year, the Officer in Charge, Soils and Nutrition Section participated in a Workshop on *Eucalyptus mycorrhizas* sponsored by the New South Wales Forestry Commission in Sydney and read papers to the 8th International Colloquium on Plant Analysis and Fertilizer Problems in Auckland, New Zealand, and to an Australian Society of Plant Physiology symposium on Physiology in Forestry in Canberra. While in New Zealand he also inspected pine plantations in the North Island and discussed soil and nutrition problems at the Forest Research Institute, Rotorua.

Forest Hydrology: The hydrology research programme aims to increase our understanding of



both the functioning and relevance of hydrological processes operating in our indigenous and man-made forest ecosystems.

At Toolara, experiments into the effects of plantation establishment on water quality have continued. Early results indicated that the first two to three years after planting were the most critical in terms of sediment generation. The focus of the last year's work has been to monitor the efficacy of a range of soil conservation measures in reducing sediment levels associated with this phase of plantation establishment.

The main emphasis of the hydrology research programme in north Queensland over the past year has been the detailed investigation of soil physical properties in areas outside the Wuyuri experimental catchments, near Babinda. This work will provide a basis for the extrapolation of relationships established within the experimental catchments to the northern rainforest ecosystem as a whole. These relationships are important in determining the hydrological impact of various forest management practices.

Fire Research: Investigations have commenced into the feasibility of using low intensity fire to reduce high fuel accumulations in treated cypress pine stands. High fuel accumulations over large areas coupled with decreasing staff levels in western Queensland forests have led to a potentially dangerous fire situation. Fuel reduction by prescribed burning seems desirable to alleviate this problem.

Initial results indicate that where the grass cover is continuous, good burn coverage can be achieved with 20 to 30 per cent losses in the less than 3.0 metre height class. With continuous grass cover fires behave similarly to what would be expected in an open grassland. However, the present high cattle stocking rates on lease areas on State Forests have led to intense grazing activity and a consequent decrease in grass cover.

Forest Entomology: Defoliation by phasmatids in coastal lowland forests was less severe than in previous years and in some areas there has been partial recovery of previously debilitated trees. Nevertheless, the level of activity of other leaf-eating and leaf-sucking insects remains high. Serious drought in parts of south-east Queensland in 1977 resulted in considerable tree death.

Widespread infestations of a spider mite were recorded for the first time in exotic pine plantations in south-east Queensland. Many young Caribbean pine trees suffered severe foliar chlorosis but no tree death has occurred. A combination of ladybird and phytoseiid mite predators and weather conditions unfavourable to the spider mite was responsible for controlling the infestation.

Release of insect bio-control agents of lantana, groundsel and harrisia cactus has continued. In the case of lantana, agents released have arrested spread of the plant in several coastal regions, particularly in central Queensland.

Forest Pathology: *Dothistroma* needle blight of radiata pine has increased in area and severity at Gambubal where it was recorded in 1977 but it has not been found in any other State Forests. The high rainfall at Gambubal will probably make control of *Dothistroma* very difficult but this will not apply in other radiata areas of Queensland. The three varieties of Caribbean pine were found to be susceptible in growth house studies but it is not known if *Dothistroma* will establish in the coastal areas where Caribbean pines are grown.

Aerial photography has shown that the area of dead rainforest associated with *Phytophthora cinnamomi* increased substantially on the Eungella Tableland between December, 1976 and August, 1978. By contrast, there has been little change in affected forests elsewhere.

Armillariella root rot is usually infrequent in coastal pine stands but this year heavy losses were found in two-year old Honduras Caribbean and slash pines in an area of about 10 hectares at Toolara.

Forest Zoology: Wildlife research aimed at ensuring the conservation of native fauna in State Forests has continued in the current year. The survey of birds, mammals, reptiles, and amphibians in the coastal lowlands has been completed and a report is being compiled. A new survey of birds in all plantations in southern Queensland has been initiated. Specific studies are continuing on greater gliders and rainbow lorikeets, two animals potentially disadvantaged by the establishment of large scale exotic pine plantations in the coastal belt. It is expected that the results of these studies will provide guidance in the selection and management of areas to be set aside for fauna conservation.

Mensuration and Biometrics: Conversion of computer programs to the Univac system at the State Government Computer Centre continued during the year, and most major production programs are now fully operational, often with enhanced facilities. Other less frequently used programs are being converted as the need arises. The availability of a terminal within the section has been of considerable assistance in this work. As mentioned in the last report, the use of a local mini-computer, to manage the large volume of experiment measure data in current use, is seen as the most effective technique for the future. Until this matter is finalized, the much-needed redesign of the present card-based systems for processing the data is being delayed.

Progress continues to be made in the processing of north Queensland rainforest data from experiments and yield plots, but because of the large number of species and methods of grouping involved, data validation and editing are very time-consuming. However, some useful output is now being obtained, and a preliminary study of diameter increments has been initiated.

Weight scaling studies in cypress pine in the Dalby and Warwick Districts have provided very promising results. Within a particular sale area, the variation from load to load in the overbark mass to underbark volume conversion factors is considerably less than those found in similar studies on slash pine and hoop pine in coastal regions. This indicates that quite a low sampling intensity would be required for an acceptable level of precision in estimating sale volumes by this technique. An additional study is in progress to determine whether some type of volume or tariff tables could be applied in cypress pine sales. Samples taken from a number of sales show significant differences in d.b.h.-volume relationships, but as yet it has not been possible to relate the differences to site or locality factors.

A punch card key to the rainforest species of north Queensland was prepared by the Department in 1971 and the original stock of 300 copies is now exhausted. The key has now been revised and expanded to cover 800 species, in a co-operative project with the Queensland Regional Station, Division of Forest Research, C.S.I.R.O. (Atherton).

The biometrical service to research stations and other branches continued normally throughout the year. A series of three one-week courses in Statistical Methods was held at the Gympie Training Centre. The material presented was of an introductory nature and aimed at the younger professional and technical research staff. The courses were favourably received and will be repeated next year.

A stand-level growth model was constructed for Honduras Caribbean pine based on annual remeasurement of 240 experimental plots extending from Beerburum to Byfield. The model which predicts gross basal area increment as a function of standing basal area, age, stocking and site index, will be used to provide information on forest growth and yield. Work has commenced on the development of a similar relationship for hoop pine.

TIMBER UTILIZATION

General: The Branch consists of five sections:—

- (i) Wood Chemistry and Preservation;
- (ii) Wood Structure and Utilization;
- (iii) Timber Conversion and Seasoning;
- (iv) Timber Mechanics;
- (v) Timber Users' Protection Act.

While most staff are located in Brisbane, officers are stationed in Atherton and Rockhampton to handle enquiries from north and central Queensland; respectively.

Staff were again involved at State and National Committee levels in preparation or revision of Australian Standards relating to wood and wood based products. Co-operation with Division of Building Research, C.S.I.R.O., and the Division of Wood Technology and Forest Research, New South Wales Forestry Commission continued. Officers also assisted the Department of Education and the Timber Research and Development Advisory Council (T.R.A.D.A.C.) in giving specialist lectures.

A Branch newsletter has been successfully introduced. The newsletter promotes contact between the Branch and the timber producer and processor. It informs industry about current projects in the Branch, and gives general information on timber and its properties.

Wood Chemistry and Preservation: This group advises both the timber treatment industry and the public on timber preservation. It is involved in basic and applied research into problems associated with the preservation of wood in Queensland. In addition, officers are currently assisting in the preparation of a comprehensive revised Australian Standard on wood preservation. Major assessments of currently accepted and newly developed preservatives are in fact being made world-wide.

Field exposure trials of new preservatives for in-ground use have continued. New sites are being evaluated, because the site of the established trials is in the newly created Brisbane Forest Park and the tests may be subject to interference by recreational users of the Park. Trials at treatment plants led to the approval of a locally-manufactured type of copper-chrome-arsenic (C.C.A.) preservative, eliminating the need to import this product from the United Kingdom. All C.C.A. formulations in current use in Queensland are now manufactured in Australia.

Purchase of a new atomic absorption spectrophotometer has allowed analysis of a large backlog of samples associated with decay problems in electricity transmission poles. It has also resulted in more efficient routine monitoring of treatment plant operations throughout Queensland.

Wood Structure and Utilization: Advisory services on timber identification, properties and uses are provided as a service to industry, other Government Departments, and the public. Fifteen hundred wood specimens were identified, and 500 technical enquiries were processed during the year. Officers also provide a timber inspection service, which generally operates on an arbitral basis.



There was active involvement in Committees responsible for:—

- (i) Australian Standards for timber and wood-based products;
- (ii) evaluation of properties of structural timber;
- (iii) research and development in the timber industry;
- (iv) education in timber technology;
- (v) framing of State legislation concerning use of timber in buildings;
- (vi) tree and wood quality improvement.

Recommendations were made on procedures which would improve serviceability of preservative-treated softwood in weather-exposed use. Electricity authorities were advised how to increase the service life of cooling tower timbers, and how the availability of cross arms for transmission poles might be improved.

A major study commenced in co-operation with a particle-board producer, to examine relationships between raw material and processing variables, and to possibly improve the efficiency of production.

Screening of wood quality in trees selected for the third slash pine seed orchard continued, as did studies of wood property inheritance in that species. Assessment of the patterns of variation in tree growth, wood formation and climatic variables in slash and Caribbean pines continued, including one study in co-operation with the Australian National University.

Timber Conversion and Seasoning: The section was involved in development of solar kilns for low cost seasoning of both hardwoods and softwoods. This should benefit small timber producers, sawmillers, merchants and the end user. A solar timber kiln of 15 cubic metres capacity was constructed for research and demonstration purposes at the Department's Salisbury Depot.

More than half the cost of materials was covered by a generous donation from a large country-based timber firm. The kiln is essentially a glass-house, with a fan to circulate the heated air through stripped stacks of timber. Drying trials have been very promising and have included species ranging in density from hoop pine to grey ironbark. Several firms are showing interest in the kiln, with a view to installing their own.

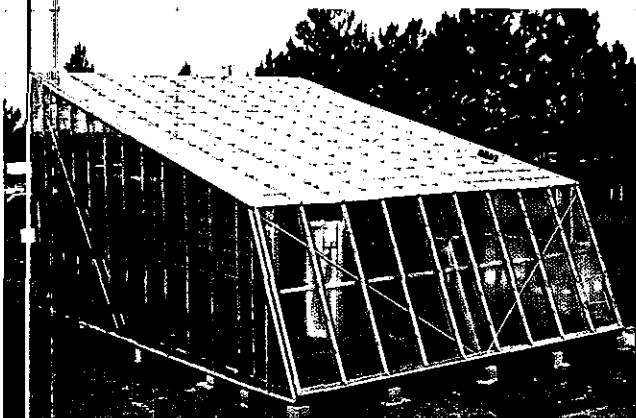
Kiln tests were made for several firms and reports prepared on their timber seasoning facilities, as part of the Department's extension service to industry.

Two large sawmilling studies, one on slash pine and the other on hoop pine, from Queensland plantations, were completed and reports are being finalized. Graded recoveries of sawn material from pruned and unpruned stems over a range of size classes were assessed. A complementary veneer and plywood study was undertaken on similar material in co-operation with the Plywood Association of Australia and C.S.I.R.O., Division of Building Research. Billets peeled were from large diameter pruned logs of hoop, slash and loblolly pine. Further work is proposed with species of interest in central and north Queensland. These studies provide data which assist the Department in making policy decisions, and assist the timber industry in planning future development.

Timber Mechanics: In association with Wood Structure and Utilization officers, strength testing of Queensland timber species was carried out, which provided data used for allocating strength groups to each species. These are needed in engineering design practice. Studies of the strength properties of Caribbean pine grown in Departmental plantations have commenced.

Quality assurance testing of machine stress graded timber for industry continued. Tests of glue-laminated beams, and of glue-lines, were made for several firms. Nailing configuration patterns used in cypress pine were tested for their comparative efficiency. Testing facilities are generally available to industry at nominal charges.

Timber Users' Protection Act: Extension work and user education are carried out by inspectors based in Brisbane, Atherton and Rockhampton. During the year, 66 T.U.P.A. cases were resolved satisfactorily, while 21 are still being investigated. Only two cases required referral to the Solicitor-General for possible legal action. Timbers from overseas or interstate were involved in most complaints, but proposed new legislation in Queensland (and New South Wales) would generally overcome this problem.



Solar kiln constructed at the Department's Salisbury Depot for research and demonstration purposes.

Routine testing of preservative-treated timber samples indicated that timber is generally treated satisfactorily. However, a significant percentage of failures were recorded when routine tests of moisture content levels were made. It is the responsibility of individual companies to season timber to within the statutory limits of 10 to 15 per cent before sale.

Timber Entomology: The fumigation programme to eradicate the West Indian drywood termite (*Cryptotermes brevis*) in Brisbane City commenced on 8th May, 1979, and should be completed by mid-August, 1979. This project is the largest of its type attempted anywhere in the world. Twenty-two multistoried buildings (including Parliament House) and some smaller structures will be fumigated in the programme. The data collected so far indicate the fumigation is 100 per cent effective. This success could not have been achieved without the willing co-operation and support of the many organizations which are necessarily involved in a project of this size.

Publicity about the project led to more public awareness and hence location of West Indian drywood termite infestation in 16 houses in the inner Brisbane suburbs. Sundry items of infested furniture which originally came from buildings now being fumigated in the city were also found. All known infestations in Brisbane will be controlled before the insects' next flight season in November–December, 1979. Follow-up surveys will be required for a number of years to detect any other infestations.

During the past year, three more houses were fumigated in Maryborough. One further infestation was recently located in Bundaberg as a result of movement of an infested item from

Brisbane. Surveys throughout Queensland will be continued for a number of years and infested premises will be fumigated.

Research into the control of auger beetle (*Bostrychidae*) and powder post borer (*Lyctidae*) infestations in mining timbers continues. The recommended control method of cold soaking timber with oil-based preservatives is performing well. In more recent trials, which included application of insecticidal dusts as a control, the results were not promising.

Studies of susceptibility of timber to powder post borer (*Lyctus brunneus*) and *Cryptotermes brevis* were maintained. In the future, *Minthea rugicollis* and *Heterobostrychus aequalis* will also be studied. The latter is an exotic auger beetle capable of reinfesting seasoned timber, which unfortunately commonly escapes detection in quarantine because larval infestation is not obvious.

Timber Pathology: Inspection of timber structural members regarded as "durable" in a forced draft water cooling tower at a central Queensland power station revealed unexpected white rot attack. Surveys are now being initiated to assess the most suitable timber species for this use, to reduce the risk of fungal attack.

Failures of wooden columns in the basement of an old Brisbane city building were inspected and found to be due to fungal and some insect attack. The timbers had been in service for 70 years. This service life was surprising because faulty building methods were used at the time of construction, with the columns being set in porous concrete. This permitted continuous wetting which encouraged fungal attack.

Division of Administration

Accommodation: Following on 13 years' location in Wills' Building, Ann Street, the Chief Office, with the exception of its Division of Technical Services, moved during the latter half of May, 1979, to new high-rise accommodation in Mineral House at 41 George Street, Brisbane, occupying three floors with shared library accommodation.

The co-operation received from the Department of Works and the State Government Computer Centre in the co-ordination of this shift is gratefully acknowledged.

Allied to a considerable betterment in overall accommodation, this move has afforded the opportunity for improved work relationship grouping within Divisions and more effective administrative co-ordination.

Pending further developments, Brisbane District Office and the Division of Technical Services are still located in rented space in Ryan House at Upper Roma Street, whilst laboratory accommodation for the latter is temporarily located in the former United Services Club building in George Street.

Overseas Travel: As the State's Official Representative, the Conservator of Forests attended the 8th World Forestry Congress at Jakarta in October, 1978, and also participated in pre-congress and post-congress tours within Indonesia and the Philippines.

In company with the Honourable the Minister for Lands, Forestry and Water Resources, the Conservator also visited New Zealand towards the end of January, 1979, as Departmental Representative on the Australian Forestry Council.

The District Forester, Gympie, was a delegate to the 1978 Fire Study Tour of the U.S.A. conducted in July and August, 1978, whilst Mr R. A. Yule, Forest Entomologist, also visited the U.S.A. during this period to investigate the methodology of fumigation and treatment of large buildings against West Indian drywood termite.

New Zealand was the venue for visits by Dr D. I. Bevege who attended the 8th International Colloquium on Plant Analysis and Fertilizer Problems in Auckland in August, 1978, by Mr J. D. Muir, as Director of Operations, who visited New Zealand during May, 1979, under the New Zealand/Australia Forest Officer Exchange Scheme and by Dr D. A. Gilmour, Principal of the Forestry Training and Conference Centre at Gympie, who visited various training centres in that country during March, 1979.

Staff: At 30th June, 1979, the approved salaried staff establishment was 645. Actual staff level at 30th June, 1979, was:—Salaried officers 633, Wages employees 1 213. Appendix 15 provides details of staff distribution.



Two views of the Department's new accommodation in Mineral House, 41 George Street, Brisbane.

Fifty-eight salaried officers left the Department including 19 officers who retired after lengthy periods of meritorious service.

This large number of retirements is a result of the Queensland Government's action to allow officers to retire as early as age 60. It is obvious many officers have and will in the future take advantage of these favourable provisions. The loss of the services of these experienced officers will have a significant impact on the Department's organization for some years.

Forest Estate: The total area of land set apart as State Forests and Timber Reserves was increased by 138 788 hectares and now stands at 4 198 859 hectares.

The greater part of the land reserved was made available for forestry purposes either as a result of freeholding application or in the further dealing, at expiry, with large tracts of land formerly held as Pastoral Holding. A significant area of land being about 5 785 hectares, located mainly in the Toolara/Tuan area, was acquired by purchase to augment available planting land.

Parliament during the year sanctioned the excision from existing State Forests of some 4 347 hectares of land. Of this, about 3 699 hectares was excluded to be made available for National Park purposes.

An amount of \$907,533 was expended on the acquisition of land for forestry purposes as follows:—

	\$
Purchase of Land	842,743
Survey Fees	63,306
Real Property Fees and Lands	
Department charges	1,484
	\$907,533

Legislation: Some minor amendments to the Forestry Act were made during the year. Sections affected were mainly those dealing with the composition and operation of the Timber Research and Development Advisory Councils. An amendment was also made to broaden the scope of the discretion available to the Conservator in placing demands for the recovery of stumpage and costs of investigation in relation to breaches of the Act.

Notifications were published in accordance with requirements under the Diseases in Timber Act to authorize the fumigation of certain buildings which were found to be infested with *Cryptotermes brevis* (West Indian drywood termite).

Offences: Investigations were undertaken into 107 reported breaches of the Acts administered by the Department.

Of these cases, 57 actions involved suspected breaches of the Timber Users' Protection Act while the remaining actions were taken under the Forestry Act, the majority being for unauthorized interference with marketable timber and other forest products.

Prosecution action was taken in four cases resulting in five persons being convicted and fined a total of \$950. In addition, one of these offenders was ordered to make restitution of \$2,560.62 to cover stumpage value of the timber destroyed without authority.

Two of the prosecution actions related to the unauthorized removal of epiphytes from State Forests, one for unauthorized interference with timber on a Crown Holding and one for unauthorized entry on to a State Forest.

In other cases where it was considered there had been no deliberate attempt to defraud the Crown, or where there was insufficient evidence to sustain a prosecution, demands were made on the offenders for reimbursement of the Department's investigation costs and assessed loss of stumpage. A total of \$25,549 was recovered by way of these demands.

Records: Steady progress has been made with the new classification index, with the assistance of Management Services staff. A draft index has been prepared and it is anticipated that the new system will be operative early in 1980.

AUTOMATIC DATA PROCESSING

The successful conversion of all production computer systems to the UNIVAC 1100/42 computer was completed during the year. This operation proved to be far more complex and resource consuming than had at first been anticipated. The conversion activity fully involved the branch for more than half the year.

Development of the redesigned Plant Accounting System is continuing with some sections of the new system being implemented as from the target date of 1st July, 1979.

A redesign of the Plantation Register System has been commenced with the initial feasibility study having been completed.

Two graduate programmers were added to the staff during the year bringing the complement of EDP specialist officers to three systems analysts, two classified programmers and three graduate programmers. Through the facilities offered by the State Government Computer Centre, a number of clerical and other specialist officers were given some training in computer appreciation and basic computer concepts. It is intended to continue to provide

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this training opportunity to give such staff some insight into the use of computers and their role in management.

ACCOUNTS

The acquisition of a third Data-Saab Electronic Accounting System will considerably improve facilities to process financial data.

Conversion of the manual procedure of receipting is proceeding and other procedures will be converted to machine systems during the coming financial year.

Budgeting: The Departmental budgeting system was introduced to improve the management of available funds throughout the Department, particularly through the concept of district budgeting.

One aspect is that within each vote, District Foresters and certain Branch Heads are given specific allocations for the various projects planned within the overall approved programme. These officers have delegation to vary to some extent, the project approvals within the allocation. Progress reports on work done and related expenditure are sent to Head Office.

Another important aspect is the management of the available funds within the Department and

the Department's contribution towards the Treasurer's management of the State Budget. This is achieved by regular reviews of expenditure during the year and forecasts of requirements for the remainder of the financial year. Where appropriations do not match forecasts, a decision is required on the need to vary activities to cope with the forecasted variation.

The results are most promising. District Foresters are better able to plan work and adjust priorities within their delegation with more confidence and less reference to Head Office.

Through the regular review of progressive expenditure and forecasts for the future, senior management is in a better position to take the appropriate action for the efficient use of funds and other resources particularly when a major change to the approved programme is one of the options.

It seems likely that the Department in future will concentrate more effort on the budget system for management rather than rely on the detailed historical recordings.

The changes have placed heavy demands on staff, particularly those involved in accounting duties, and their efforts have contributed greatly to the benefits achieved.

I would like to take this opportunity to record my appreciation of the loyal and efficient service of staff members during the past year and wish those officers who retired a long and happy retirement.

W. BRYAN,
Conservator of Forests.

Appendices

APPENDIX 1

STATE FORESTS AND TIMBER RESERVES LISTED BY DISTRICTS AND SUB-DISTRICTS AT 30th JUNE, 1979

— HECTARES —

District	Sub-District	No. of Reservations	State Forest Areas	No. of Reservations	Timber Reserves Areas
Brisbane	Beerburum	23	53 741-124 7	2	256-518
	Brisbane	26	50 025-713	6	4 577-419 1
	Total	49	103 766-837 7	8	4 833-937 1
Dalby	Chinchilla-	19	446 014-274	1	5 768-00
	Barakula	12	225 684-325	2	150-203 3
	Dalby	39	264 253-323	2	19 750-08
	Roma				
	Total	70	935 951-922	5	25 668-283 3
Gympie	Gympie	25	33 940-074	1	514-00
	Imbil	9	57 604-00	1	0-209 4
	Toolara	5	61 847-35	..	..
	Total	39	153 391-424	2	514-209 4
Maryborough	Bundaberg	18	111 517-25	15	20 949-046
	Maryborough	24	218 778-199	7	10 808-6
	Tuan	6	60 211-3	2	28-539 9
	Total	48	390 506-749	24	31 786-185 9
Monto	Kalpowar	9	25 534-712	9	18 198-374 9
	Monto	38	284 586-121	9	9 962-452
	Total	47	310 120-833	18	28 160-826 9
Murgon	Jimna	4	45 622-00	..	..
	Murgon	21	81 053-743	6	5 610-498 3
	Total	25	126 675-743	6	5 610-498 3
North Queensland	Atherton	31	367 226-257	26	311 313-198 6
	Ingham	17	237 132-234	2	798-4
	Total	48	604 358-491	28	312 111-598 6
Rockhampton	Emerald	11	90 281-18	10	106 927-8
	Mackay	16	92 852-921	12	26 891-92
	Rockhampton	38	470 610-066	7	38 423-218
	Total	65	653 744-167	29	172 242-938
Warwick	Inglewood	29	202 243-247	..	..
	Warwick	18	43 262-786	1	720-3
	Total	47	245 506-033	1	720-3
Yarraman	Benarkin	4	30 873-00	1	5-124
	Yarraman	20	54 756-952	8	7 553-398
	Total	24	85 629-952	9	7 558-522
State Totals		462	3 609 652-151 7	130	589 207-299 5

APPENDIX 2

AS AT 30-6-79—RESERVATION FIGURES 1-7-78 to 30-6-79

— HECTARES —

	No. of Reservations	Area
STATE FORESTS		
As at 30th June, 1978	453	3 443 626·904
Declared	+ 12	+ 34 304·904
Declared and added to existing State Forests		+ 112 953·335 4
Amalgamation of existing State Forests	— 8	
Timber Reserves declared State Forests	+ 5	+ 17 738·58
Timber Reserves declared State Forests and amalgamated with existing State Forests		+ 619·2
State Forests revoked .. .. .	..	..
State Forests partially revoked		— 4 329·102 3
Areas released		— 233·042 9
Recomputation of boundary		+ 4 971·373 5
	462	3 609 652·151 7
TIMBER RESERVES		
As at 30th June, 1978	141	616 444·389 5
During the year whole or partial revocation of Timber Reserves, whole or partial declaration of Timber Reserves as State Forests, and amalgamation of Timber Reserves with State Forests occurred.		
The position at 30th June, 1979	130	589 207·299 5

APPENDIX 3

NET AREA OF SOFTWOOD PLANTATION ESTABLISHED 1st APRIL, 1978, TO 31st MARCH, 1979
— HECTARES —

District	Native Conifers			Exotic Conifers				Total Conifers
	Hoop Pine	Bunya Pine	Total Native	Slash Pine	Caribbean Pine	Other Exotic Conifers	Total Exotic	
Brisbane	21	..	21	565	151	1	717	738
Gympie	161	..	161	1 533	308	..	1 841	2 002
Maryborough	15	..	15	2 054	578	30	2 662	2 677
Monto	52	..	52	..	..	..	..	52
Murgon	185	..	185	..	..	..	..	185
Rockhampton .. .. .	..	..	..	..	187	..	187	187
North Queensland .. .. .	..	..	..	..	383	59	442	442
Warwick .. .. .	..	..	..	20	..	73	93	93
Yarraman	347	..	347	33	71	..	104	451
Total.. .. .	781	..	781	4 205	1 678	163	6 046	6 827

APPENDIX 4

*NET AREA OF EFFECTIVE SOFTWOOD PLANTATION AS AT 31st MARCH, 1979
— HECTARES —

District	Native Conifers				Exotic Conifers				Total
	Hoop Pine	Bunya Pine	Other Native Conifers	Total Native Conifers	Slash Pine	Caribbean Pine	Other Exotic Conifers	Total Exotic Conifers	
Brisbane	1 349	7	4	1 360	12 741	909	1 932	15 582	16 942
Gympie	11 478	231	36	11 745	21 448	1 052	267	22 767	34 512
Maryborough	1 496	3	29	1 528	22 511	2 721	72	25 304	26 832
Monto	2 624	1	1	2 626	22	3	13	38	2 664
Murgon	7 515	128	1	7 644	..	..	46	46	7 690
Rockhampton	262	..	1	263	1 010	4 391	58	5 459	5 722
North Queensland	1 031	1	123	1 155	5	2 786	109	2 900	4 055
Warwick	13	..	..	13	339	..	2 318	2 657	2 670
Yarraman	13 507	171	3	13 681	497	283	1 932	2 712	16 393
Total	39 275	542	198	40 015	58 573	12 145	6 747	77 465	117 480

*Previous Figures corrected for Write Offs, Boundary Recomputation and Re-checks.

APPENDIX 5

*NET AREA OF EFFECTIVE BROADLEAVED PLANTATION AS AT 31st MARCH, 1979
— HECTARES —

District	Native Forest Hardwoods					Other Broadleaved Species	Total Broadleaved Species	Miscellaneous Experimental
	Rose Gum	Grey Ironbark	Blackbutt	Other Native Forest Hardwoods	Total Native Forest Hardwoods			
Brisbane	130	84	93	42	349	1	350	24
Gympie	531	156	111	166	964	92	1 056	10
Maryborough .. ..	..	..	48	1	49	2	51	39
Murgon	8	6	3	..	17	9	26	1
Rockhampton .. ..	..	..	..	1	1	1	2	5
North Queensland	1	14	..	15	30	134	164	13
Warwick .. ..	..	..	..	..	..	..	..	10
Yarraman	71	137	..	4	212	122	334	31
Total	741	397	255	229	1 622	361	1 983	133

*Previous figures corrected for write-offs, boundary recomputation and re-checks.

APPENDIX 6

AREAS OF NATURAL FOREST TREATED 1978-79
— HECTARES —

District	Eucalyptus	Cypress Pine	Total
Brisbane	167	..	167
Dalby .. ..	..	7 936	7 936
Gympie	87	..	87
Maryborough	1 174	..	1 174
Monto	1 130	..	1 130
Murgon	495	..	495
Warwick .. ..	..	1 950	1 950
Rockhampton	450	..	450
Yarraman	44	..	44
Total	3 547	9 886	13 433

APPENDIX 7
MILLING TIMBER REMOVALS FROM CROWN LAND
 — Cubic Metres Gross Measure —

1977-78 Total	Species	Brisbane	Dalby	Gympie	Mary- borough	Monto	Murgon	North Qld.	Rock- hampton	Warwick	Yarraman	1978-79 Total
48 973	Hoop, Bunya and Kauri ..	575	..	1 965	18 483	9 043	5 804	6 026	1 300	..	3 603	46 799
122 586	Cypress Pine ..	109	99 411	..	..	..	..	..	2 177	24 436	..	126 133
429	Other Pine ..	..	..	..	..	..	..	1 228	21	..	..	1 249
239 202	Forest Hardwoods ..	30 681	27 016	23 832	43 700	19 503	28 930	9 810	38 634	3 914	6 803	232 823
77 028	Rainforest Structural Timbers ..	68	..	1 201	189	90	955	53 773	8 931	2 436	287	67 930
33 215	Prime Cabinetwoods ..	..	..	1	34	1	10	36 655	210	..	4	36 915
40 463	Miscellaneous Cabinetwoods ..	68	..	944	19	1	342	47 779	980	..	53	50 186
73 716	Native Plantation Conifers ..	..	..	32 307	204	3 666	7 328	269	..	..	29 663	73 457
90 676	Exotic Plantation Conifers ..	49 859	..	7 858	9 423	..	440	..	1 655	7 055	13 466	89 756
338	Plantation Non-Conifers ..	..	..	120	..	..	..	..	..	..	187	307
726 626	Total ..	81 360	126 427	68 228	72 052	32 304	43 809	155 540	53 908	37 841	54 086	725 555



APPENDIX 8

PULPWOOD REMOVALS FROM CROWN LAND 1978-79

— Cubic Metres Gross Measure —

1977-78 Total	Species	Brisbane	Gympie	Maryborough	Murgon	Yarraman	1978-79 Total
10 679	Native Conifers .. ..	..	8 230	133	2 766	58	11 187
85 481	Exotic Conifers	18 258	15 264	18 386	20	2 774	54 702
9 803	Non-Conifers .. ..	..	..	..	..	5 300	5 300
105 963	Total	18 258	23 494	18 519	2 786	8 132	71 189

APPENDIX 9

REMOVALS UNDER HAULAGE CONTRACTS

— Cubic Metres Gross Measure —

This table shows the quantities hauled and payments made for the haulage of milling timber during 1978-79 by contractors to the Department. The quantities shown are also included in Appendix Number 7.

South Queensland						North Queensland		
Hoop and Bunya Pine	Forest Hardwoods	Rainforest Structural Timbers	Prime Cabinet-woods	Miscellaneous Cabinet-woods	Total	Payments Made	Prime Cabinet-woods	Payments Made
22 096	17	123	59	163	22 458	\$ 463,350	935	\$ 18,464

APPENDIX 10

MISCELLANEOUS REMOVALS FROM CROWN LAND

1977-78	Product	1978-79	Unit
1 747	Sleepers 1-2	207	pieces
63 196	1-5	44 743	
..	1-8	400	
3 371	2-0	2 114	
234 188	2-15	215 119	
1 078	2-3	..	
540	2-4	5 725	
193	2-5	..	
1 897	Transoms, crossings, headstocks, etc.	692	cubic metres
22 777	Girders, corbels, piles, sills, kerblogs	22 000	metres
941	Girder logs	583	cubic metres
62 256	Poles	91 380	metres
137	House blocks	34	metres
99 440	Fencing material—round	84 741	metres
111 716	Fencing material—split	135 527	pieces
90 875*	Mining timbers—round	92 488	metres
178*	Mining timbers—sawn	292	cubic metres
4 877	Mining timbers—other	4 462	pieces
249	Offcuts	462	cubic metres
..	Head and limb logs	525	cubic metres
7 053	Fuelwood	4 729	tonnes
500 064	Quarry Material (sand, gravel, soil, etc.)	702 683	cubic metres
94	Freestone	49	cubic metres
6 tonnes	Fibre, bark, leaves, etc.	66	cubic metres
..	Crows' Nest	7	tonnes
3 710	Flora	8 604	pieces
210	Peat	311	bags
10-5	Lawyer Cane	7-5	tonnes
2	Boat Knees	40	pieces
24	Bee Hives	33	hives
..	Fronds	192	pieces
64	Black Wattle	222	pieces
35	Charcoal	29	tonnes
421 064	Trees and Plants	418 261	number

*Corrected Figures.

APPENDIX 11
MILLING TIMBER REMOVALS FROM PRIVATE LANDS 1978-79
 — Cubic Metres Gross Measure —

*Total 1977-78	Species	North Qld.	Brisbane	Dalby	Gympie	Mary- borough	Monto	Murgon	Rock- hampton	Warwick	Yarraman	Total 1978-79
6 927	Hoop, Bunya and Kauri ..	29	1 903	12	399	803	..	100	233	1 293	184	4 956
62 352	Cypress .. .. .	..	8	43 731	..	..	..	..	341	19 401	..	63 481
258	Other Pines	8	259	..	..	..	..	..	1	1	..	269
364 944	Forest Hardwoods	7 503	128 823	10 330	11 184	48 044	30 320	11 424	38 093	14 966	14 010	314 697
13 546	Rain Forest Structural Timbers	9 313	678	..	..	47	..	..	1 366	1 280	33	12 717
3 596	Prime Cabinetwoods ..	2 096	58	..	12	4	..	..	26	19	..	2 215
9 878	Miscellaneous Cabinetwoods	5 605	983	..	7	142	..	..	1 043	..	..	7 780
54	Plantations, Native ..	..	..	..	54	..	..	..	..	..	..	54
22 744	Plantations, Exotic ..	30	8 428	..	..	13	..	..	..	352	22	8 845
..	Plantations, Non-Conifer ..	..	..	..	..	..	..	..	..	..	..	..
7 366	Imported .. .. .	..	6 462	..	..	..	..	..	..	..	..	6 462
491 665	Total (est.)	24 584	147 602	54 073	11 656	49 053	30 320	11 524	41 103	37 312	14 249	421 476

N.B. Volumes shown in the above Table have been estimated due to incomplete Statistics being available at time of compilation.
 *Corrected Figures.

APPENDIX 12

COMPARATIVE STATEMENT OF RECEIPTS BY FUNDS
FOR THE YEARS 1977-78 AND 1978-79

1977-78		1978-79
\$		\$
727	CONSOLIDATED REVENUE FUND—	
	Miscellaneous	2,005
554,109	LOAN FUND—	
212,889	Sale of Motor Vehicles and Plant	586,470
	Plant Hire	578,639
	Repay Temporary Loan Fund Advance	675,400
766,998		1,840,509
	FORESTRY AND LUMBERING FUND—	
42,803	Opening Balances	270,348
6,355,983	Log Timber Receipts from Districts	6,906,869
856,752	Forestry and Lumbering	866,112
2,604,672	Plant Hire	2,858,282
510,902	Other Receipts	483,421
188,174	T.R.A.D.A.C... .. .	192,154
10,559,286		11,577,186
270,348	Less Balances Carried Forward	261,824
10,288,938		11,315,362
	FORESTRY DEVELOPMENT FUND—	
192,899	Opening Balance	31,502
214,137	Commonwealth Grant for Aboriginal Advancement.. .. .	230,000
	Commonwealth Forestry Softwood Agreement	1,485,400
14,555,400	Loan Fund Contribution	14,880,000
959,693	Special Projects Fund	500,000
15,922,129		17,126,902
	Less Special Projects Fund contribution credited against expenditure	500,000
15,922,129		16,626,902
31,502	Less Balance Carried Forward	216,102
15,890,627		16,410,800
\$26,947,290	Total All Funds	\$29,568,676

DISPOSAL OF RECEIPTS

\$		\$
727	The above receipts were disposed of as follows:—	
	To Consolidated Revenue Fund as repayment of Expenditure ..	2,005
554,109	To Loan Fund—	
212,889	Repayment of Previous Expenditure	586,470
	Excess Plant Hire	578,639
	Repay Temporary Loan Fund Advance	675,400
766,998		1,840,509
	To Forestry and Lumbering Fund—	
6,876,755	Expenditure on Marketing, Maintenance of Roads, Capital Improvements, Plant and T.R.A.D.A.C.	7,208,011
3,412,183	Interest and Redemption on Loans	4,107,351
10,288,938		11,315,362
	To Forestry Development Fund—	
15,890,627	Expenditure on Reforestation, Land Acquisition, Plant Purchase, Road Construction and Working Equipment	16,410,800
\$26,947,290	Total All Funds	\$29,568,676

APPENDIX 13

COMPARATIVE STATEMENT OF EXPENDITURE BY FUNDS
FOR YEARS 1977-78 AND 1978-79

1977-78		1978-79
\$		\$
7,279,907	CONSOLIDATED REVENUE FUND—	7,757,251
13,366	Salaries	227,034
63,060	Termite Eradication	66,213
811,026	Fares, Printing and Stores	972,263
61,767	Travelling Expenses and Incidentals	85,686
92,404	Recreation Facilities—Maintenance	232,873
	Cash Equivalent of Long Service Leave	
8,321,530		9,341,320
	Less Expenditure credited for Grants from Special Projects Fund and Displaced Sandminers from Fraser Island	14,774
48,354		
8,273,176		9,326,546
	LOAN FUND—	
213,226	Recreation Facilities—Construction	341,846
13,880,000	Amount to be credited to Forestry Development Fund ..	14,880,000
14,093,226		15,221,846
	Less Expenditure credited for Grants from Brisbane Forest Park Trust and Displaced Sandminers from Fraser Island	121,958
67,015		
14,026,211		15,099,888
	TRUST AND SPECIAL FUNDS—	
	Forestry and Lumbering Fund—	
3,412,183	Interest and Redemption on Loans	4,107,351
755,647	Railway Timber Supplies	828,085
2,827,361	Marketing	2,981,923
977,945	Roads—Maintenance and Subsidies	933,487
2,409,046	Maintenance of Plant	2,643,884
271,828	Maintenance of Capital Improvements	290,891
	Expenses—Timber Research and Development Advisory Councils	176,255
181,452		
10,835,462		11,961,876
	Less Expenditure credited for Grants from Apprentice Training, Flood Relief, Displaced Sandminers from Fraser Island and Miscellaneous	646,514
546,524		
10,288,938		11,315,362
	FORESTRY DEVELOPMENT FUND—	
13,835,388	Reforestation	13,582,329
219,100	Land Acquisition	907,533
1,525,126	Purchase of Plant	1,408,535
916,801	Roads—Construction	1,045,270
221,621	Purchase of Radio and Firefighting Equipment	
	Purchase of Working Equipment	157,967
	Repayment of Temporary Loan Fund Advance	675,400
16,718,036		17,777,034
	Less Expenditure credited for Grants from Special Projects Fund, Displaced Sandminers from Fraser Island and Miscellaneous	1,366,234
827,409		
15,890,627		16,410,800

APPENDIX 14

STATEMENT OF AVAILABILITY AND APPLICATION OF FUNDS
FOR YEARS 1977-78 AND 1978-79

1977-1978		\$	1978-79
	AVAILABILITY OF FUNDS		
\$ 8,440,935	Consolidated Revenue Fund .. .. .	..	\$ 9,830,914
..	Forestry and Lumbering Fund	11,123,208	8,608,618
8,005,393	<i>less</i> Maintenance of Plant	2,514,590	
14,222,899	State Loan Fund .. .. .	..	15,131,502
1,000,000	Special Project Fund—Unemployment Relief	500,000	
675,400	Commonwealth Softwood Forestry Agreement	810,000	
229,600	Aboriginal Advancement Grant	230,000	
900,000	Displaced Sandminers—Fraser Island	1,000,000	
126,666	Flood and Cyclone Damage Restoration	445,790	
66,177	Apprenticeship Training Scheme	70,482	3,056,272
\$33,667,070	TOTAL—All Sources .. .. .	..	36,627,306
	APPLICATION OF FUNDS		
8,246,397	Consolidated Revenue Fund—		
13,366	Administration (Salaries, etc.)	9,028,600	
61,767	Termite Eradication	227,034	9,341,320
	Maintenance of Recreation Facilities	85,686	
	Forestry and Lumbering Fund—		
	Marketing and Logging, Maintenance of roads, buildings, plant, financial charges		
	and miscellaneous	11,537,534	
	<i>Plus</i> balance carried forward	261,824	
		11,799,358	
8,331,095	<i>Less</i> Maintenance of Plant included in Plant Hire Charges	2,514,590	9,284,768
	Forestry Development Fund—		
16,718,036	Reforestation Works, Acquisition of Land and Purchase of Plant	17,101,635	17,317,737
31,502	<i>Plus</i> balance carried forward	216,102	
	Construction of Recreation Facilities .. .. .	..	246,846
213,226			
33,615,389	*Lapsed Funds		36,190,671
51,681			436,635
\$33,667,070	TOTAL—All Uses		\$36,627,306

*Lapsed funds relate mainly to a saving in cost of the West Indian termite eradication programme of \$421,000, due to lower tenders than estimated.

APPENDIX 15

DISTRIBUTION OF PERSONNEL 30th JUNE, 1979

	Metropolitan	District	Total
Salaried Staff—			
Graduate	64	68	132
Technical	82	27	109
Field Supervisory	6	104	110
Clerical	143	126	269
Miscellaneous (Drawing Office Aides, General and Laboratory Assistants etc.)	12	1	13
Sub-Total	307	326	633
Wages Staff—			
Reforestation	14	849	863
Marketing and Resources	15	129	144
Road Construction and Maintenance .. .. .	..	76	76
Maintenance of Plant and Maintenance of Capital Improvements	10	86	96
Recreation Facilities—			
Construction and Maintenance	1	31	32
Miscellaneous	1	1	2
Sub-Total	41	1 172	1 213
Total	348	1 498	1 846

APPENDIX 16

DEPARTMENTAL PUBLICATIONS 1978-79

RESEARCH NOTES

23. Siemon, G. R. 1978. Modulus of rupture—modulus of elasticity relationships of some Queensland-grown softwoods. 4p.
24. Shea, G. M. and Armstrong, P. A. 1978. The effect of post harvest environmental factors on the longevity of hoop pine seed. 2p.
25. Keys, M. G. 1979. Growth of hickory ash as a plantation species and as an underplant in treated rainforest at Kuranda, North Queensland. 4p.
26. Frodsham, T. M., Pomroy, P. C. and Shea, G. M. 1979. The screening of 2,2-DPA, TCA Hexazinone and Alachlor for selectivity to slash pine and honduras caribbean pine.

RESEARCH PAPERS

9. Simpson, J. A. 1978. Nursery nutrition studies with slash pine at Beerburum. 32p.
10. Johnston, T. N. 1978. The growth and control of harrisia cactus on a state forest in southern inland Queensland. 46p.

TECHNICAL PAPERS

11. Fisher, W. J. 1978. Growth and production in some open forests of the Blackbutt Range, South Queensland. 28p.
12. Fisher, W. J. 1978. Spacing, branch size, branch longevity and wood quality in plantations of hoop pine at Yarraman. 17p.
13. Dale, J. A. 1979. Growth and yield of white cypress pine in the Injune-Augathella zone of South-West Queensland. 10 p.
14. Fisher, W. J. 1978. A basis for the selection and management of scientific areas in Queensland State Forests. 24p.
15. Cokley, K. V. 1979. Timber preservation in Queensland. 14p.
16. Shea, G. M., Bowyer, P. C. and Frodsham, T. M. 1979. An investigation into tree shaker harvesting of slash pine cones in South Queensland. 9p.

RESEARCH REPORT

First in a series of periodic reports, in broad summary, of those experiments in the fields of forest and timber utilization research on which interpretative work has been carried out during the report period.

This Report covers the period for research conducted up to mid-1977. 96p.

INFORMATION SHEETS

- No. 1 Forest Conservation.
- No. 2 Drywood Termites.
- No. 3 Why Plant Exotic Pines.
- No. 4 Your Home and Bushfires.
- No. 5 Multiple Use.
- No. 8 Mammals of North Queensland.
- No. 9 Forest Fires.

FOREST DRIVES

- Imbil Forest Drive.
- Brooyar Forest Drive.
- Yarraman Forest Drive.
- Benarkin Forest Drive.
- Wooroi Forest Drive.

WALKING TRACKS

- Lake Boemingen Trail.

STATE FOREST PARKS

- Numinbah State Forest Park.

OTHER PUBLICATIONS

- Gympie Forestry Training and Conference Centre.

APPENDIX 17

BOTANICAL NAMES

A. NATIVE CONIFERS

Bunya Pine	..	..	..	<i>Araucaria bidwillii</i>
Cypress Pine	..	..	..	<i>Callitris columellaris</i> . Syn. <i>Callitris glauca</i>
Hoop Pine	..	..	..	<i>Araucaria cunninghamii</i>
Kauri Pine	..	..	..	<i>Agathis robusta</i> <i>Agathis palmerstonii</i>

B. EXOTIC CONIFERS

Caribbean Pine	..	..	..	<i>Pinus caribaea</i>
Honduras Caribbean Pine	..	..	..	<i>Pinus caribaea</i> var. <i>hondurensis</i>
Loblolly Pine	..	..	..	<i>Pinus taeda</i>
Patula Pine	..	..	..	<i>Pinus patula</i>
Radiata Pine	..	..	..	<i>Pinus radiata</i>
Slash Pine	..	..	..	<i>Pinus elliottii</i> var. <i>elliottii</i>
Ocote Pine	..	..	..	<i>Pinus oocarpa</i>
Douglas Fir	..	..	..	<i>Pseudotsuga menziesii</i>

C. EUCALYPTUS

Blackbutt	..	..	..	<i>Eucalyptus pilularis</i>
Grey Ironbark	..	..	..	<i>Eucalyptus drepanophylla</i>
Gympie Messmate	..	..	..	<i>Eucalyptus cloeziana</i>
Rose Gum	..	..	..	<i>Eucalyptus grandis</i>
Spotted Gum	..	..	..	<i>Eucalyptus maculata</i>
Swamp Mahogany	..	..	..	<i>Eucalyptus robusta</i>
White Mahogany	..	..	..	<i>Eucalyptus acmenioides</i>

D. OTHER BROADLEAF SPECIES

Brown Salwood	..	..	..	<i>Acacia mangium</i>
Brush Box	..	..	..	<i>Tristania conferta</i>
Hickory Ash	..	..	..	<i>Flindersia iffaiiana</i>
Satinay	..	..	..	<i>Syncarpia hillii</i>

E. WEEDS, GRASSES, ETC.

Groundsel	..	..	..	<i>Baccharis halimifolia</i>
Harrisia Cactus	<i>Eriocerus tortuosus</i>
Lantana	<i>Lantana camara</i>

F. MAMMALS

Greater Glider	<i>Schoinobates volans</i>
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G. BIRDS

Rainbow Lorikeet	<i>Trichoglossus harmatodus</i>
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