

FOREST FIRE INSURANCE IN NEW ZEALAND

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SYNOPSIS

Losses from forest fires have not been serious during the last twenty years and statutory regulations may have some bearing on this state of affairs. With the increase in plantations, however, there is a case for insuring against loss. A comprehensive scale is suggested, rather than a flat rate. This would consist of a basic rate, with additions for site conditions, age and condition of the crops, size of the forest, factors of access, and quantity of wood being harvested annually. Deductions would be made for defined fire detection and control measures, and would also depend on the available equipment and manpower.

INTRODUCTION

Perhaps my first interest in this subject was when I was called out at 2 a.m. one morning to join a team fighting a fire in a rubber plantation just outside Kuala Lumpur. The glare could be seen from miles away and no artificial light was needed within half a mile of the blaze, so I gained a healthy respect for forest fires. Later at Campbelltown outside Sydney I watched each summer the black pall hanging over the Bulli Pass from the bushfires.

Fire quickly devastates either when used for controlled burning to clear an area, or if uncontrolled, when its cost to the community can be disastrous, as in the Tasmanian fires of 1967. Fortunately, since 30,000 acres were burnt at Taupo in 1946, New Zealand has remained fairly free from serious forest fires, the largest burning 7,000 acres at Balmoral Forest in 1955. Especially with prices available from exports, loss to an owner of his timber would include both his asset and also a substantial profit. There are also to be considered the loss of mill use, redeployment of workers, while with limited liability companies the security of shareholders and others with financial interests needs protection. Thus the desirability of insurance for this class of asset is well founded.

Whilst not directly concerned with fire insurance, liability may also be incurred for damage to other people's property arising from spreading fire. Normally cover for such damage is not difficult to obtain and standard conditions apply, but depending on the proximity of other valuable assets a sizeable indemnity may be required. Clearly the question of visitors, subcontractors, and public access in the forest, especially during cutting, will have the underwriter's attention. Care must be taken to see that all subcontractors have an adequate and acceptable insurance protection and it is desirable to see their policy.

INSURANCE

Many countries have provisions for insuring growing timber. Most insurance authorities load for resinous timber as opposed to hardwoods, proximity to railways and for cutting in forests. Some grade for age, giving reductions as trees mature. Altitude is taken into account. Italy has a 10%, and France a 5%, self insurance clause. In the U.S.A. an 80% average clause is applied. Discounts are given in various countries for lookouts, fire gangs, aerial patrols, firebreaks and clear boundaries. Penalties attach where trees are owned and cutting is done by different parties. Some have a 60-day cancellation clause. Costs incurred in firefighting are often covered and in Sweden cover is available for soil and damage to fences and bridges.

In New Zealand there has been only spasmodic demand for fire insurance of growing timber. Often requests are made because of particular local hazards and few underwriters have made sustained profits. Because of this, premiums are necessarily high and this in turn reduces the demand for insurance. However, there is a growing consciousness of the need for protecting these valuable assets, especially where the owners are public companies, responsible to shareholders, and often committed to heavy borrowing.

FOREST RESOURCES

It may be pertinent to recall that planting of exotic trees to replace the dwindling native resources increased in tempo in the mid-1920s. Then, following financial difficulties of numerous afforestation companies, the tempo slackened as there appeared little return on capital and no great demand internationally to keep the forestry industry buoyant. Since 1950, with our increasing internal demand, coupled with the expanding export market, intensified after devaluation, the economic viability of growing timber has become very favourable, when backed by scientific knowledge and application.

While there are still large native forests it is the quick-growing and lucrative exotics that have become of major importance in New Zealand. Of these the most important is radiata pine, which constitutes 90% of the plantings carried out by private companies. The total area of exotic forests in the country is 1½ million acres, of which 660,000 belong to the State, 400,000 to private owners, and the balance is owned by local authorities. Substantial planting programmes are in progress and it is anticipated that by the year 2000 the current acreage will be more than doubled. The National Development Conference recommendation No. 16 plans for 52,000 acres of new planting each year, and an additional 5,000 acres to be planted annually for the years 1970-75 to provide an increased volume of timber for export for the period 1996-2000. The areas most favourable for forest development are the Taupo-Bay of Plenty region, Hawke's Bay, and portions of the South Island in Otago and Nelson. Whereas in Europe final felling may be undertaken at 80 years, here the rotation for radiata pine is

round 30 years and the latest information seems to be that the optimum economic returns are available even sooner. Apart from the ordinary demand for domestic and commercial sawn timber, the introduction of pulping has increased timber consumption. The value of exports of timber has risen from \$16 million in 1963 to \$51 million in 1968, and could double in the following ten years. The production of exotic roundwood has risen from 50 million cu. ft in 1958 to 180 million cu. ft in 1968.

FIRE HAZARDS IN FORESTS

There are two major factors, the intrinsic nature of the forest in its susceptibility to damage, and the various causes of fire. To support combustion there must be fuel and oxygen. Wood is obviously inflammable and the finer the division the more easily it will burn. The worst hazard is in trees below 12 years of age. Not only are they small, but there is often a ground cover of inflammable plants, thinnings or slash left on the forest floor. Other factors influencing the spread of fire are topography, where upward slopes assist spread, scrub boundaries and, most important, weather. The peripheral areas of scrub were largely responsible for the spread of the serious fire at Taupo in 1946. Ideally a forest should be surrounded by cleared farmland. The State forest at Kaingaroa has an internal farm strip half a mile wide to act as a division. Recently the use of narrow internal firebreaks has been questioned, as they are difficult to keep clear and are probably not wide enough to be effective. Emphasis is now placed on maintaining clear accessways for vehicles.

However, a correct assessment of forest fire hazard is primarily dependent on prevailing weather conditions. Travellers through State forest areas are well aware of the fire danger signs by the roadside. The calculation of the grading is based on the time of year, days since rain, amount of rain, wind velocity and direction, temperature, relative humidity, and fuel moisture content.

In this country the main cause of fires is man. Great emphasis is placed overseas on the presence of railways near a forest, but this factor seems to have little import here. The presence of the public in the forest, or picnic grounds, must be deemed unfavourable features, although they can increase the reporting of fires. Trespassers, especially hunters, will always be a problem, and constant patrols should be undertaken during the fire season. The milling of timber in a forest area is justifiably regarded with concern. Cutting of timber by bush teams, especially when using heavy-duty trucks and equipment, brings additional hazards, although they make available manpower for fire control work.

STATUTORY REGULATIONS

It is opportune to look at some of the provisions of the Forest and Rural Fires Act. This Act was passed after, and

because of, the 1946 Taupo fire. It was amended in 1955 and is currently under review.

Rural Fire Districts can be constituted by Order in Council to protect trees, flax and other plants. Within the districts a Fire Authority is named to promote and carry out measures for prevention, detection, control and suppression of fires. By Section 17 the Forest Service was appointed to observe weather conditions and issue warnings of fire hazard, to prohibit fires in the open and, under Section 20, logging, saw-milling and land clearing may be curtailed. A closed fire season can be declared annually and during this period no fires can be lit in the open without a permit. The season runs from around 1 October to 1 April, but varies with local conditions. No engine without a spark arrestor may be used in a forest during the season.

Under Section 32 the Principal Fire Officer has absolute control of manpower and equipment during a fire and may enter any building, cause property to be burnt or destroyed, and may co-opt any fit male over 18 years of age within five miles of the district to assist in fire suppression. Back-burning can be done only under his supervision and compensation may be available for losses incurred where assets are not insured.

In support of the Act there are also Regulations which lay down detailed requirements for work in forest areas. Every vehicle must have a fire extinguisher and shovel during the closed fire season. Section 8 requires the patrol of an area for 30 minutes after men have left work. By Section 24 all mechanical fire-fighting equipment shall be tested at least fortnightly during the season.

ARRANGING A POLICY

Most insurance companies write this business on their standard fire policy and expect a proposal to be completed. Previous losses from fires would, of course, be of direct concern to the insurers. As far as I know, cover has not been given for losses arising from windthrow, vermin or disease. Generally it is accepted that the area to be insured will be inspected by the insurers and they will complete a report, based substantially on the factors listed in the rating scale shown later. It is common practice for insurers to ask their clients to bear a percentage of any claim, and there is a warranty on the policy that the insured complies with the Forest and Rural Fires Act. I think the policies should also require compliance with any local fire plan. Consideration should be given to insuring fences, and fire-fighting expenses that may be incurred.

Whilst the Forestry Encouragement grants do not require insurance, the Forestry Encouragement Loan Agreement for local authorities does have a clause requiring insurance from an approved insurer.

SUM INSURED

This is the most difficult area of decision for both parties. The insurers require full insurance to obtain adequate contri-

bution to their premium funds. The insured may well be in a quandary as to the basis on which to insure. There are mathematical formulae available, but these are rather complex and one wonders whether their application would be practical with the current variations in stumpages. For areas where trees are below 20 years of age the usual basis is for compounding costs of seedlings, planting and silviculture. The figures might appear as follows:

Site preparation, planting and tree stocks	\$40 per acre
Thinning and pruning	\$30 per acre
Annual costs	\$5 per acre p.a.
Interest rate (compound)	7%

For mature trees a stumpage rate is used. This is assessed by taking the scale value of grown timber and deducting logging and sawmilling costs, risk and profit, the residual value being the stumpage value. Details vary so widely, depending on the factors involved, that it is not possible to quote a figure and with the current prices being offered for exports it becomes extremely difficult to assess the true worth of the forest. The best solution is to have an amount assigned for each acre or compartment, preferably determined by a forest consultant and set out in a valuation, which then establishes a mutually acceptable basis of approaching a loss settlement, allowance being made for actual costs and provisions for windthrow, pests, etc.

RATES

Here, as in most places in the world, the rates being charged are above a notational basic level because of lack of statistics and the election only to insure when losses are easily perceived. Broadly speaking, rates are below 1%. Rather than have a flat rate, as is often the case, I feel that a comprehensive scale would be more realistic and advantageous both to the insured and to the insurers. I therefore suggest the following:

Basic rate

1a	Hardwoods	0.200%
1b	Softwoods	0.350%

Additions

2a	Rainfall; mean rainfall over last 5 years between 1 October and 28 February:	
	(1) Below 20 in., above 15 in.	0.050%
	or (2) Below 15 in., above 10 in.	0.125%
	or (3) Below 10in.	0.200%
2b	Topography:	
	If more than 200 ft difference in altitude within the forest	0.125%
2c	Age:	
	If more than 20% of forest below 12 years of age	0.100%

2d	Size; if forest exceeds:						
	(1) 1,000 ac	....	....	....	....	....	0.025%
or	(2) 10,000 ac	....	....	....	....	....	0.050%
or	(3) 20,000 ac	....	....	....	....	....	0.100%
2e	Boundaries:						
	If less than a 5-chain break on all boundaries clear of trees, bush and scrub	....	....	....	....	....	0.050%
2f	Tending:						
	If less than 50% of the forest is receiving tending						0.025%
2g	Vehicle access:						
	If less than one mile to each 250 acres of forest						0.025%
2h	Public access:						
	If a public road crosses the forest, or campers, shooters or picnic parties allowed	....	....	....	....	....	0.025%
2j	Cutting:						
	(1) Production less than 2 million cu. ft per annum	....	....	....	....	....	0.050%
or	(2) Production more than 2 million cu. ft per annum	....	....	....	....	....	0.100%
	(3) If any cutting done by subcontractors	....	....	....	....	....	0.050%
2k	Mill:						
	If any sawmill is in or within 10 chains of the forest	....	....	....	....	....	0.200%

Deductions

3a	Local fire plan:						
	Compliance with approved local fire plan	....	....	....	....	....	0.150%
3b	Manpower:						
	For minimum manpower in forest during year—						
	(1) Above 10 but below 30	....	....	....	....	....	0.025%
or	(2) Above 30	....	....	....	....	....	0.050%
3c	Equipment:						
	(1) For any mobile water tanker of 500 gal capacity, grader or bulldozer always available for fire fighting	....	....	....	....	....	0.050%
	(2) For hand equipment as approved by local fire officer	....	....	....	....	....	0.025%
3d	Lookout:						
	For lookout constantly manned during fire season with at least 80% coverage of forest	....	....	....	....	....	0.100%
3e	Excess:						
	For voluntary excess—						
	(1) 2½% of sum insured allow 15% of premium otherwise chargeable.						
or	(2) 5% of sum insured allow 30% of premium otherwise chargeable.						

The term forest will include all plantations within 10 chains of one another, insured or not. The need for this definition is because of the occasional election to insure only a young plantation which is really part of a larger forest, and the whole area has to be considered unless there is a reasonable separation.

Alternatively, additional rates could be based on "burning days", which occur when fuel moisture indicator sticks

register 35% or "red warning" days; but while most forests have a rain-gauge, they may not have the sticks or other relevant information.

This type of rating structure highlights the various factors which influence the hazard. It is desirable for insurers to survey each plantation to ascertain the various features and investigate how risk can be reduced; this is an important part of insurance work. The Forest Service is always prepared to assist with advice. Care must be taken to ensure that fire appliances are in working order and readily available. The use of VHF radio for communication among gangs and forest headquarters can be useful for fire control work.

FIRE DAMAGE

The extent of damage is related to the age of the stands and prevailing weather conditions. Young stands can quickly be completely destroyed and in Dunedin in 1969 12-year-old trees were rendered valueless. In mature stands the degree of damage will depend on heat penetration. A fire may burn the surface bark or crown and retard growth. If it penetrates further it may kill the cambium, but it does not necessarily destroy the merchantable stem. If conditions are dry and there are strong winds then, especially on an upward slope, a fire will move with surprising rapidity and devastation. Once a good hold is obtained, serious spotting can occur over considerable distances, causing new fires to develop. The actual control of forest fires is an expert's field in which a considerable amount of research is being carried out in North America and Australia. Current control methods over large areas include water bombs, infra-red spotting and prescribed burning, although these methods do not appear to be used in New Zealand. However, all authorities stress the need for hand appliances to be available.

CLAIM SETTLEMENT

The claim settlement should be investigated by forest consultants, who will give technical advice on figures presented. The basis on which the insurance has been arranged should be utilized in arriving at the extent of the loss, due allowance being made for any material alterations such as windthrow. Consideration should be given to the question as to the date at which the loss is to be assessed. In one settlement, the date of possible replanting some time later than the fire was taken as the effective date of assessment, which appears to be incorrect.

Besides the actual loss of timber, the owner may well be faced with miscellaneous costs. These may arise from fire-fighting wages, expenses, levies, use and possible loss of equipment, damage to fences, bridges and roads. The debris will have to be removed and re-establishment costs incurred. These costs require additional insurance and should be seriously considered. In a recent fire damaging 13 acres sup-

pression costs totalled \$3,000. Under Section 39 of the Act such costs could be levied on owners in the locality.

SALVAGE OPERATIONS

Once fire has been through a merchantable stand, immediate action must be taken to assess the damage and initiate salvage operations. The knowledge and co-operation of the insured is most important to minimize the claim. Two main problems must be borne in mind — the first that degrade from fungus may occur in the burnt timber and cause it to be valueless, and secondly that in the event of a serious fire local mills may be unable to cope with the damaged trees, particularly if there is a lucrative export trade otherwise available. The occurrence of sap-stain is difficult to evaluate, but most authorities indicate that salvage operations might well be limited to six months, unless expensive precautions are taken. The need for expert guidance of foresters is obvious. Experience has been gained by State employees following the salvage operations of 10,000 acres of windthrow at Eyrewell in 1964. Research by competent authorities into the most economical methods of handling large areas of fire-damaged timber would be beneficial to the country. High salvage yields have been quoted from American sources for mature stands, but to a marked degree it would become a question of economics in assessing the incurred costs against the residual values.

CONCLUSION

Clearly the forest industry in this country is capable of continued expansion, and consequently the financial implications must be carefully considered. Forest owners may need to reconsider the question of insurance protection in view of the sizeable values now involved in timber and the dependent secondary industries relying on them. This will be encouraged when the insurance premiums and conditions are sufficiently attractive to make them an economic proposition.