

QUALITY LOSSES OF WINDTHROW TREES

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The main factors influencing deterioration of windthrow material are sapstain, wood rotting fungi, insects and to a certain extent broken logs, shatter and loss of bark.

The first problem is sapstain as once the M.C. of the tree drops below 90% then stain will occur. The most susceptible specie is strobis followed by ponderosa pine, contorta, radiata, corsican and the most resistant specie of those involved would be Douglas fir.

Sapstain or blue stain is caused by several species of fungi and the most important sapstain fungi to attack exotic softwoods in New Zealand are *Diplodia pinea* and *Ceratocystis* spp. Sapstain fungi can colonize wood at relatively high M.C. (90%) but they also require suitable temperatures (optimum temperature is between 70° and 80°F) below this optimum, growth of the sapstain is slow. So weather conditions play an important part in the growth of sapstain. With regards to the April windthrow Autumn had commenced with cold wet conditions prevailing. This helped to retard the growth of the sapstain. This was in complete contrast to the Canterbury blowdown which occurred in August 1975 when hot dry conditions were experienced and rapid drying of windthrow material resulted again in reducing the incident of sapstain and fungi growth.

Sapstain will become established in the logs from the cut or shattered ends or through places where the bark has been removed or damaged. When the conditions are right for sapstain to become established, the conditions for other wood rotting fungi, such as *Peniophora gigantea* are also right. Thus sapstain showing in logs is an indicator that the conditions of moisture content, temperature food supply and air are also the conditions needed for wood rotting fungi.

So far there has been no problems with insects and this again is due to cold wet winter weather. At the time of writing a few *Hylastes ater* are being found in export logs arriving at the wharf. Insect problems will be encountered

as soon as the warmer weather approaches and most of the species of insects found in exports have their flight season from approx November to March/April depending again on weather conditions.

EFFECTS OF QUALITY LOSSES ON FINAL UTILISATION

On the export side of forest produce, there are criteria to be met. Logs for example, must be free of insect or sign of and free from wood rotting fungi. Sapstain is allowed, but only light stain. There is always the risk that if sapstain is present, conditions are right for wood rotting fungi to develop. This can be seen in cross cut ends as change in colour, wedge shape discolouration, texture of the cut end and in the advance stage, fruiting bodies of the fungi.

Care must be taken in the selection of export logs on the bush skids, taking into account that there may be up to a further two months storage at the wharf before shipment and also a change in weather conditions, especially temperature which could accelerate the growth of fungi while in storage.

With the warmer weather approaching, there will be an increase in the growth of sapstain and wood rotting fungi, but there is also a large increase of insect population which can result in costly fumigations or total reject for those insects that cause stem damage. Over the period of Nov/April last season, all log exports from Nelson and Picton had to be fumigated, on account of infestation by *Arhopalus* spp. This was the result of the disastrous fire at Hira plantation and smaller fire through the Marlborough Sounds. One fumigation of a shipment of logs loaded at Picton and fumigated on board ship cost in the vicinity of \$26,000.

Logs delivered to sawmills for conversion into export and local sawn timber also needs to be closely supervised from bush skids to finished product. Export sawn timber does allow only light stain in some grades of timber, depending on end use. For example, dressing and finishing grades, merchantable grade and factory grade are appearance grades and most customers are reluctant to accept material showing stain. Framing and construction grades and Japanese squares only light stain permissible for export. At the time of this windthrow there is a depressed overseas and domestic market and the buyers are insisting on a good marketable product.

Another factor with windthrow material is the treatability of the material. With boron treatment, the critical feature is the moisture content. With the diffusion process, a high moisture content is required in order that the boron salts will diffuse into the wood. At the time of the Canterbury blowdown, all diffusion plants closed down as the timber was too dry to allow the diffusion process to operate satisfactory. We had the same conditions to a lesser extent at some of the treatment plants in this area and Operators of treatment plants were warned by the TPA to critically examine material prior to treatment in order to satisfy themselves of the moisture content.

Troubles were also found in the treatability of material using steam prior to treatment. Some of the material was found to be too dry for the steam type treatments.

CONCLUSIONS

1) In future, the quality of windthrow material will depend largely on the time of the year and the weather conditions prevailing on how rapid deterioration will take place.

If, as happened in this case, windthrow material during the cost wet months did hold in a reasonable condition as regards sapstain, fungi and insect and allowed a reasonable recovery.

2) More supervision at the bush side of operations in order to critically select logs and small wood for the particular end use. It is very costly for example, to truck logs to the wharf and have them refused on arrival for excessive stain and/or fungi. At the time of the Canterbury blowdown an Officer was delegated on a roving basis to visit all logging areas and instruct bushmen on quality accepted and also to inspect logs on skids marking out those that were not acceptable.

3) Other factors that occurred and will occur again that affected the recovery of material and which nobody can control are:

- a) The depressed state of both the domestic and export market.
- b) Strikes etc.
- c) Close down of major complexes for annual overhauls and maintenance.

4) The Timber Inspection Group assisted by carrying out bush and mill inspections and reporting to Conservancy on quality of material being recovered. I think that some of the Junior Officers on the logging side should be instructed on quality aspects of log production for both export and domestic.