SAPSTAIN AND MOULD CONTROL

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Control of stains and mould is probably the lightest form of preservation there is. Certainly in comparison to pressure impregnation it can be classed a light treatment. Nevertheless, it is a form of preservation and from the point of view of economics a very important one. In British Columbia alone there is annually in excess of 3.8 billion fbm which is treated. This volume may not mean too much to some of you so let me put it another way. If you put it in packages 2' high and 4' wide and butt them end to end the total length would run from Newfoundland to British Columbia and back to Montreal. If you lined up the individual pieces end to end it would go around the equator 23 times or to the moon and back again plus around the world two times. The value of the lumber is in excess of $1,330,000,000.

The reason for anti-stain treating is to prevent moulds and stains from discolouring the unseasoned lumber. In addition, it is also to extend the shelf life in customers' yards. In simple terms, anti-stain treating is the non-pressure application of a thin layer of chemical solution that is toxic to wood staining fungi. The principle chemical used today in Canada is sodium tetrachlorophenate. There are many methods of application. Some saw mills apply the solution using spray chambers of which there are several types. Also common are the "drive in", or "drive through", tanks. There are a few "on-the-chain" total submersion systems. In more recent years the dip system, in which packaged lumber is bulk dipped in tanks of chemical solution, is gaining popularity.

If we were to ship unseasoned lumber without anti-stain treating, it would in most cases arrive extremely discolored. By the time the end user was ready to use the lumber there could be some degree of fibre breakdown. The degree of stain, mould and decay would vary depending on the species in question, the amount of sapwood and the time of year. (Temperature is a major factor in fungal activity).

I wish I could stand before you and proudly say we always ship bright clean lumber to the market place. Unfortunately, this is not the case. It is impossible to identify the amount of stock that arrives in other than excellent condition. The customer to some degree has become accustomed to stain and accepts a certain amount as being the custom of the trade. There are still some insurance companies that make stain claim settlements. Many claims are settled between buyer and seller and these figures are not divulged.

Our organisation provides a reinspection service in the European, UK and Japanese marketplace for our members' products. Since the spring of this year there have been 19 major claims initiated by discoloration. Bearing the previously mentioned factors and adding non-member production, it can be seen that the problem is substantial.

There are two major problems facing Canadian producers. They are:

1) Stain and mould on unseasoned lumber
2) Moisture pickup on kiln dried stock which ultimately results in mould and stain.

The most cost effective chemicals known to man for controlling fungal stains and moulds are still the sodium salts of penta and tetrachloropnenate. During the last five years the Western Forest Products Laboratory (now Forintek Canada Corp.) nas tested 44 chemical formulations against wood inhabiting fungi and not one could achieve the overall effectiveness of sodium tetrachlorophenate.

Why then, if we are using the best known chemical, are we still having problems?

- Could it be we still do not have the ideal chemical?
- Are the application systems still in need of improving?
- Are the quality control precedures inadequate?

The answer is probably yes to all three of these questions.

There is a definite need for continuing research. Laboratories around the world are looking for more efficient and safer chemicals. Some years conditions are more favourable for fungal activity than others. Several years ago we had such a year and the number of complaints and claims resulted in the formation of a committee to investigate the situation. This resulted in an intensive program of field and retention testing. The first phase of the project was to identify in the marketplace the effectiveness of current anti-stain treating systems.

On January 10, through January 15, 1977, Dr. P. Perrin (Western Forest Products Laboratory) and A.A. Vandermeulen (Council of Forest Industries of B.C.) examined unseasoned CLS grade hem-fir at the Green Street dock in Brooklyn, New York and at Port Everglades in Fort Lauderdale, Florida.

The objectives of the study were:

1) To examine individual pieces of lumber for:
   a) mould
   b) stain (various degrees of same)
   c) mycelium and wood destroying fungi

2) To obtain small sample specimens for testing to determine:
   a) the retention of anti-stain chemicals
   b) the anti-stain effectiveness

3) To determine the condition of attached stickers and lath or veneer.

After completing the two inspections, the following observations were noted:

- all packages examined contained stain, mould and decay.

- pieces in outer extremities of packages (outer 4 in.) contain much less stain, mycelium and decay.

- significantly less stain and decay in packages where 1/4 in. (approx.) lath was used in stripping tiers than when veneer lath was used.

- quality and condition of attached stickers generally satisfactory.

- no significant difference in occurrence of decay in the 6 to 12 in. widths in lumber stored in Fort Lauderdale.

  2 x 4 in. – 13.8% of pieces with decay
  2 x 6 in. – 29.2% " " " "
  2 x 10 in. – 30.0% " " " "
  2 x 12 in. – 29.7% " " " "

- significant difference in occurrence of decay in the various widths in lumber stored in Brooklyn.

  2 x 4 in. – 24.5%
  2 x 6 in. – 11.8%
  2 x 8 in. – 13.5%
  2 x 10 in. – 18.8%
  2 x 12 in. – 12.5%

Following completion of the study, every unit in all member sawmills was tested for efficiency and chemical retention tests were done on a quarterly basis. This has resulted in improvements in equipment and some degree of increased efficiency of application. It still is not, however, considered consistently adequate to meet the high standards expected by our offshore customers. Another novel procedure tried during this era of awareness to the problem was the modification of a sodium tetrachlorophenate with a wax water-repellent additive. In addition, a colour pigment was added. The colour pigment aids in the quality control. Extensive field tests in the marketplace have indicated some improvement but it still cannot be classed as 100% efficient. A side benefit was a substantial decrease in weight loss due to moisture evaporation in vapour form, while moisture from rainfall was not reabsorbed. This treatment is currently being tested in the marketplace on rough lumber. To date, I have not heard of customer reaction. A problem one might anticipate is the acceptance of other preservative chemicals, particularly in the non-pressure impregnation systems, (such as the double vacuum or the dip systems) which are commonly used in European countries. Another disadvantage is the fact that the solution must be applied using a spray system which, while efficient in a planing mill-type process (one piece at a time), is not as effective a system when used in a sawmill situation.

It is not my intention to dwell on safety and environment issues of the chemicals used in industry as this is a subject that will be covered by Dr. Cedar in his presentation. I would be remiss, however, if I did not highlight that chlorinated phenols have been used for fifty years and are still the most effective deterrents to fungal stain. It is time, however, that we raised out heads above the sawdust, so to speak, and faced the fact that they are toxic! There is a need for a good, workable code or practice for chemical use and handling. There is also a need for more awareness to the dangers involved and some frank discussions on the subject.

The importance of exports to Canada's economy is, I am sure, understood by all of you. As far as lumber exports are concerned, the importance varies between the provinces of Canada. In British Columbia it is a significant factor. B.C. exports 80% of its lumber produc-

tion. This volume accounts for over 45% of the total world softwood lumber export trade. Total exports of the B.C. forest industry in 1979 were $5.7 billion. This represents over 60% of the value of all exports from British Columbia.

Millions of promotional dollars are being spent to further increase export markets for Canadian lumber. This project is a cooperative effort by the federal government, the B.C., government and the COFI members and the affiliated members. The program is named Cooperative Overseas Market Development Program (COMDP).

How successful this progam will be in the future will largely depend on the arrival condition of our products in these new market-places.