A VISION FOR THE INDUSTRY - RAW MATERIALS AND PRODUCTS

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Summary

Although not typically thought of as a scientific pursuit, predicting the future is a necessary part of research planning. This paper attempts to answer some specific questions posed by the board of directors of CWPA. It then presents an allegory for a future scenario and finally discusses what can be anticipated from the future resource and ideas for future treated wood products.

Introduction

Attempting to predict the future is not normally considered a scientific pursuit. However, scientists involved in applied research are forced to do this on a regular basis. If they do not, their research is unlikely to be implemented. Rarely does an innovative idea take less than 10 years to develop, research, pass regulatory hurdles and commercialise. In the meantime, the market need that provoked the idea in the first place may disappear. The industry may alter its practices such that the new process or product becomes obsolete. The raw material used in the experimental work may become unavailable. Furthermore, it is rare that a research scientist will have the influence to move the industry towards any specific future scenario. It is therefore critical that the applied research scientist constantly thinks ahead at least 10 years.

In preparing this paper, I have been asked by the board of directors of the CWPA to answer some specific questions and I will deal with those before addressing the future of the industry in general, and raw material and product issues in particular.

Questions and Answers

Q. What was the greatest development in wood preservation in the 20th century?

A. The invention of CCA was the greatest development because it is the most cost effective preservative ever invented and ever likely to be invented.

Q. Where will wood preservation be in 2010 and 2025 in Canada?

A. By 2010, I anticipate the industry will have divided into two sectors: low tech, similar to today, and high tech, best defined as wood modification. By 2025, only the high tech sector will survive.

Q. What are the biggest challenges in the next 10 and 25 years?

A. In the next 10 years, the biggest challenges will remain the public perception of risk from pesticides, including wood preservatives, and market penetration by alternative materials. In the next 25 years, the biggest challenge will be a shift from primarily structural to primarily decorative uses for wood.

Q. What will be the international trends and will North America follow?

A. The Biocidal Products Directive will dramatically reduce the range of biocides used in Europe. Europe will become the balancing power to the economic clout of the USA. North America will be forced to follow by free trade agreements, harmonised registration requirements and international standards. In addition, the chemical suppliers will not wish to produce specialised products for specific markets.

Q. What part will alternative products and composite products play?

A. Alternative materials will continue to erode markets for wood, unless wood can be made low-maintenance cheaply, without using pesticide. Treatment of composite products could be larger in volume than treatment of solid wood within 25 years but this will not be pressure treatment with conventional preservatives.

Q. What part will the three traditional preservatives, creosote, penta and CCA play?

A. Creosote will no longer be in use within 10 years due to diversion of feedstock into more valuable end uses. Creosote is basically what's left over after they have distilled out the good stuff from oil. Over the years, they have gradually been identifying uses for more and more of the components. I believe that ultimately, there will be nothing left to use as a preservative. Penta will no longer be in use in less than 10 years due to public perception of potential problems with its dioxin contaminants. CCA could be restricted to ground-contact applications with high consequences of failure by regulators responding to the perceptions of a misguided vocal minority. This would be an unfortunate mistake in my view.

An Allegory for a Future Scenario

The foreseeable future of the wood preservation industry can be imagined as a roller coaster ride (Figure 1). Between the early 1970s and today, the industry rode the CCA train up the hill and stayed pretty laid back and comfortable. Recently there has been increasing anticipation of an imminent change of direction. Now they are coming up to the crest and some riders are starting to get worried. It is not easy to see how far they have yet to go up. Once they are into the thrill ride of new preservatives, those in front will have a better view and can anticipate the bumps; those in back will get a less scary ride. When they hit the bottom, some people are going to get sick because some of those new preservatives may not work as well as we expect them to. There could be quite a few shake-ups before we start riding the reliable alternative up the next hill.

Parts of Europe have already ridden their roller coaster, suffering through the shake-ups caused by poor performance of non-arsenical, copper and chromium-based (CCX) preservatives. They may now be in a second thrill ride with the non-arsenical, non chromium, copper-organic (C/O) preservatives. Japan omitted the first part of the thrill ride and went from CCA straight to the C/O preservatives part of the roller coaster. It will be interesting to see if North America can hold out long enough to go direct to organic-only or wood modification processes.

Future Raw Materials

Domestic Fibre Sources: Perhaps sooner than we might have expected, we could see a shift in control of our forest resources with the rise of a third type of ownership. Currently there is forested crown land and a much smaller percentage of forested private land. While the percentage of private land is unlikely to change, some crown lands may come under the jurisdiction of First Nations, as jointly-managed or treaty lands. This does not necessarily mean restricted harvesting, since First Nations have shown willingness to fully utilise the resources over which they have control.

Imported Fibre Sources: If the annual allowable cut in BC is reduced much further, we could see Russian logs imported into this country, just as is now happening in the USA. These species are probably very similar to our own in terms of durability and treatability. If our harvesting costs go much higher, we could see New Zealand and Chilean radiata pine lumber imported into Canada. If any of this reached the hands of the treating industry, it would make it simple to meet our treating standards, but the cost of the added preservative might well make this uneconomic.

Fibre Quality: Although we will still be harvesting old growth for many years (at least from the boreal forest), we will be seeing increasing amounts of lumber from second

growth trees entering the marketplace. These trees have grown much faster than their elderly relatives, and may reach a respectable size by the time they are harvested. Examples of old growth and second growth trees are shown in Figures 2 and 3. We may not see the former giants of the BC coast entering the sawmill, but the future coastal forest will still produce larger trees than the cordilleran (BC interior) or boreal (Northern) forests which cover much of Canada. There are some indications that second growth may be more treatable than old growth for some species. Samples of second growth western hemlock heartwood were found to be at least twice as treatable as old growth from previous studies (McFarling and Morris 1999). Where the forest has truly been managed, specifically thinned, we should see trees with larger crowns and thus wider sapwood. These trees could also yield more-treatable lumber.

Wider growth rings may lead to lower dimensional stability, particularly in those species, such as Douglas fir, where there is a large difference in density between spring wood and summer wood. Species with a more even density profile, may not be so seriously affected.

Raw Material Characteristics: For solid wood, we can expect to see more sorting of species to deliver material with more defined properties. This should facilitate treating, by reducing the variability in preservative uptake between pieces in a charge and allowing treating plants to use only the more treatable species. This last factor can make a big difference; for example, within the hem-fir mix, Pacific silver fir is almost twice as treatable than western hemlock. (Morris 1995).

For engineered wood products, we can expect to see more veneer-covered strand-based structural products and more wood-non wood mixtures.

Future Products

Product Characteristics: The treating industry will ultimately follow current trends in other industries. The products of the future will be customised to the individual and manufactured just in time for delivery. They will have excellent technical backup and quality assurance to appeal to an informed consumer. There will be a greater choice of quality, matched to value for money. Future products will be easy to maintain, for the consumer with limited free time. They will have some form of certification of environmental acceptability, through one of a number of competing organisations.

Potential Future Products: Some ideas for potential future solid wood products include:

- Termite-repellant lumber.
- Decay-, fire- and UV-resistant shakes.
- Specialty landscaping products.
- Permanently natural-looking exterior trim.

Future composite products can be divided into three groups from the point of view of the treating industry:

1. Non-stabilised composites that will deteriorate physically under conditions conducive to decay,
2. Partially stabilised composite that can be treated during manufacture and,
3. Fully stable composites that can be pressure treated. Currently the last group would include plywood and Parallam™ and it is anticipated that the numbers and types within this group will increase in the future.

A fourth category might well be naturally durable composites including bark board (Morris, Grace and Troughton 1999)

Conclusion

Hang onto your hat folks. It's going to be a rough ride.

References

McFarling S.M., and Morris, P.I. 1999. Treatability of second growth western hemlock from two sites. Report Prepared for Forest Renewal BC. Forintek Canada Corp. Vancouver BC.

Morris, P.I. 1995. Pacific silver fir is the more treatable component of hem-fir from coastal British Columbia. For. Prod. J. (45)9: 37-40.

Morris, P.I., J.K. Grace and G. E. Trougton 1999. Preliminary indications of the natural durability of spruce bark board. International Research Group on Wood Preservation Document No IRG/WP/10312 10p

Notes:

Five years ago a symposium, entitled Wood Preservation in the '90s and Beyond, was held in Savannah Georgia. The proceedings were published by the Forest Products Society. Section IV on Future Opportunities has a number of interesting papers on the same theme as this one.

The opinions expressed in this paper are solely those of the author and are not necessarily supported by Forintek Canada Corporation or the Canadian Wood Preservation Association.

Figure 1. The new preservative thrill ride. Those in front get a better view what is coming. Those in back get a less scary ride

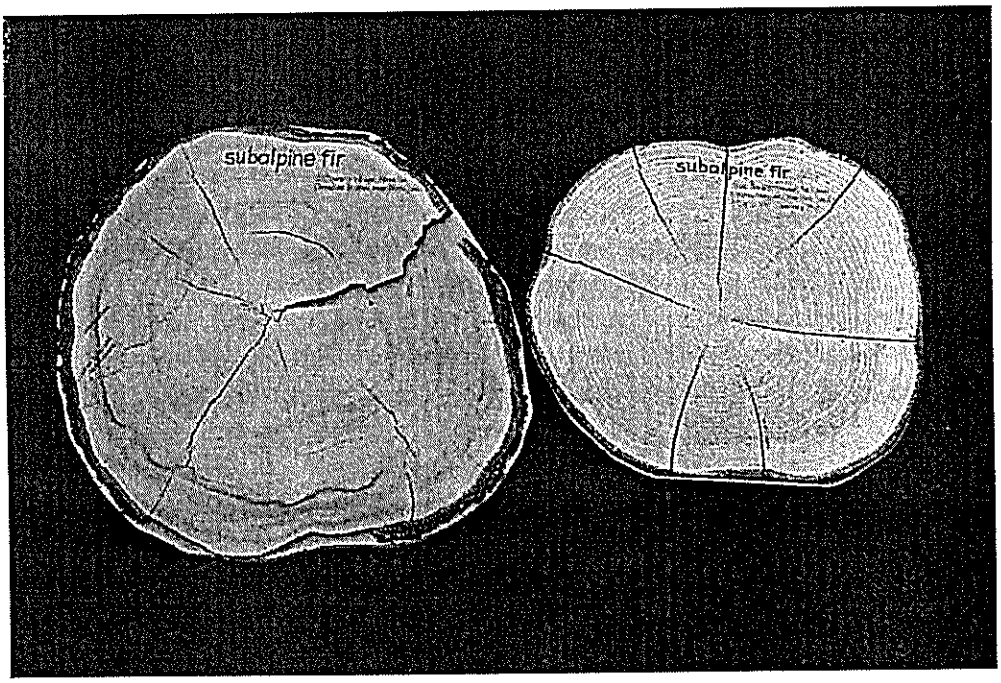

Figure 2. Old growth 210-year old subalpine fir (left) and 2nd growth 38-year old subalpine fir (right)

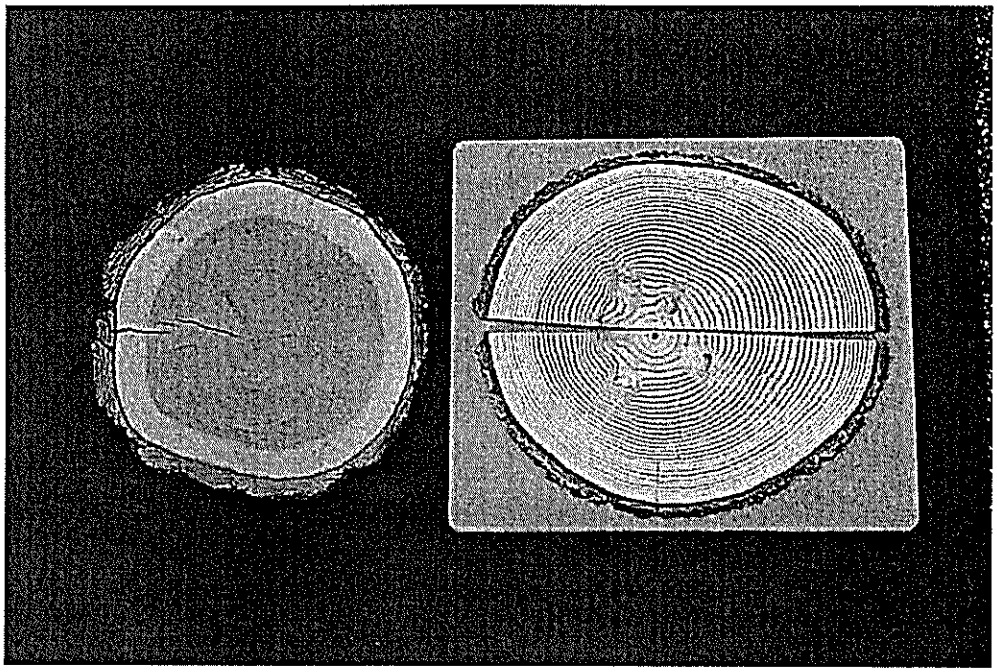

Figure 3. Old growth 85-year old Douglas fir (left) and 2nd growth 34-year old Douglas fir (right)