

Improvements in

Wood Processing

In addition to offering promising possibilities for the quantitative and qualitative improvement of forest production, biotechnology can also play an important role in wood processing.

It is already known that some micro-organisms, particularly enzymes and fungi, can transform the main components of wood (cellulose, hemicellulose and lignin) into a wide range of substances — chemical products, solvents, food products and fuels. Now, however, the challenge is to find the most effective micro-organisms and the most productive and economic techniques to achieve these results.

Iogen Corporation of Ottawa, Ontario, has unique and significant experience in the production of cellulases, enzymes that have been selected to modify or completely break down cellulose fibres to make a useful wood component. Many types of cellulases are available, namely endoglucanase, exoglucanase and betaglucosidase. Iogen was the first company to develop an enzymatic conversion technique that allows the conversion of cellulose into glucose.

Forintek Canada Corporation of Ottawa, Ontario, has identified an enzyme, xylanase, that can play a role in the process used to bleach pulp for fine papers. The pulps treated with xylanase require fewer chemical products and produce better yields. Forintek has obtained a patent for the production and purification of xylanases on a large scale.

In the Pulp and Paper Research Institute of Canada (Paprican) in Pointe-Claire, Quebec, researchers have also discovered a fun-

gus, *Coriolus versicolor*, that can bleach kraft pulp obtained from hardwood within a period of five days under aerobic conditions.

In the lumber field, Forintek Canada has developed a test for the diagnosis for biological control of fungi and sap-staining fungi that can affect the colour of wood. The wood could simply be inspected using an immunological test to detect infected wood that has not yet been discoloured and should be treated. The conventional method used to protect the wood against colour changes uses chemical products that are toxic to living organisms and can remain in the environment, whereas the treatment developed by Forintek is based on the natural competition that exists between fungi. Thus, some fungi that do not change the colour of wood or lead to rotting are used to prevent the development of undesirable fungi. This less toxic treatment may meet the environmental standards in force in the lumber export markets.



Technician working with the equipment used for the diagnosis of fungi that discolour and rot wood.

(Forintek Canada Corporation)