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## Japan: Paper industry involved in genetic engineering of eucalyptus

In spite of the potentially devastating impacts it might entail, Japanese paper manufacturers are carrying out research on genetic engineering aimed at the "creation" of trees yielding more cellulose.

Eucalyptus is the most widely used tree by the paper industry as raw material for the production of cellulose. The wood from this tree is composed of more or less equal quantities of cellulose and lignin and therefore the latter needs to be removed to obtain cellulose. In their quest for more profits, paper companies are thus working to genetically modify eucalyptus so that its wood will contain less lignin and more cellulose.

Several strategies are being developed with this aim. Nippon Paper Industries' research aims at blocking genes that adjust various stages of lignin synthesis, and its output is a genetically modified eucalyptus that produces less lignin and more cellulose, thus yielding 5% more pulp. Mitsubishi Paper Mills has developed a recombinant eucalyptus that comprises 14-16% less lignin, expecting to yield 10% more pulp, while Oji Paper focuses on facilitating removal of lignin during the pulp-making process to cut manufacturing costs and also to reduce the amount of bleaching agents needed for pulp production.

It is important to underscore that Oji Paper --Japan's largest paper manufacturer-- owns a total of 200,000 hectares of fast-growing plantations overseas, distributed in Papua New Guinea, New Zealand, Australia and Vietnam. Now it is planning to increase its annual overseas paper production 20 fold (to one million tons), counting on expansion in other Asian countries through mergers and acquisitions, with an investment of some US\$ 124 million. China is one of the major targets, as well as Thailand, Vietnam and Indonesia.

As of the end of 2000, Japan's paper industry had some 140,000 hectares of plantations in Japan itself, and some 280,000 hectares abroad. By 2010, the area overseas is expected to reach 430,000 hectares and much of the latter might eventually be composed of genetically modified eucalyptus plantations.