

Making paper out of straw

The ecology trend is here to stay and it is being written into the evolution of the pulp and paper industry as more and more entrepreneurs decide to develop quality ecological products. The most notable case being Arbokem Incorporated, a company in Vancouver, B.C. Arbokem Incorporated has developed a procedure to make pulp out of agricultural fibers (chaff from wheat, flax, barley, etc.). The corporation has even committed itself to supplying an important publishing house in California.

Recently, the Pulp and Paper Center (CSPP) at Trois Rivières (Quebec) CEGEP was successful in producing publication paper out of agricultural residues using the procedure developed by Arbokem. Currently, the procedure allows 3,000 tonnes of pulp to be produced annually. The paper product is made up of 20 per cent mineral (calcium carbonate precipitate), 20 per cent recycled fibers from old papers, 50 per cent wheat straw pulp and 10 per cent kraft pulp.

At the moment, however, one problem still needs to be resolved; the fiber from the wheat straw is short so it doesn't always provide the sturdiness needed for the printers' presses. So, in association with the CSPP, Arbokem will be analyzing several combinations of pulp, allowing for the production of different grades of paper. The most promising combination seems to be a mix of wheat pulp and flax pulp.

Why did the British Columbia company choose to work with CSPP? First of all, CSPP is one of only two centers in Canada where paper can be produced from the mixing pulp stage right up to the spooling of paper. The other center, PAPRICAN, is located in Pointe Claire, Quebec.

Another reason CSPP was chosen is that it has an experimental machine which allows for the production of small quantities of paper at a reasonable price. For the past five years, the Centre has been specializing in the development of "value added" paper, in collaboration with various companies.

"The fiscal policy of the Quebec government (tax credits available to companies) also played a part in the decision of the company to choose the Centre" said Arbokem president Alfred Wong, who is also president of Canadian Flax Pulp Limited in Vancouver.

The Centre's team is currently working on perfecting the Arbokem procedure. According to CSPP director Pierre Lavoie, they are working on the development of a good quality paper made up of 60 per cent wheat straw fibres, 28 per cent flax straw fibres, and with a 20 per cent mineral content.

Flax fibres were chosen as a complement in the process because they are long, supple and sturdy. Fibre from hemp, corn or even tobacco could also be equally used.

"The goal is to produce a high quality paper which can withstand mechanical-pressure" said Lavoie.

Already, many possibilities are envisioned for agricultural residue fibers (corn stalks, grain/bean straw, etc.). Western Canada annually produces 23 million tonnes of wheat straw, the equivalent of the total production of soft wood pulp from Canadian paper-mills. Currently, these residues are only being burned, a process which is causing a slew of pollution problems.

Agricultural residues are equally important in certain regions of Quebec. For example, it is estimated that Quebec produces about 1.8 million tonnes of corn stalks annually. If half of these stalks were sold (900,000 tonnes) to pulp factories to make commercial pulp, corn producers could enjoy a gross annual income of about \$36 million (\$40/tonne). Moreover, the new economic activity may require the creation of several small processing factories (each producing 20,000 tonnes of pulp annually). Located close to the raw material, each factory could represent a \$7 million investment in a community, and in turn create several hundred jobs.

The cultivation of flax, incidentally, could also become profitable in areas where the conditions are more suitable; such as fallow land in Abitibi. Alfalfa residues are also considered promising. Overall, the potential for development is enormous in remote regions.

"Nevertheless, we must be careful not to misjudge," said Lavoie. "Agricultural residues will never completely replace soft woods. In any case, this is not the intended goal. The best fibre for newspaper production is from Black Spruce. Everyone agrees with that! But agricultural residues still constitute an interesting avenue for paper-mills to take. The industry could use them to offer specialized products, or to give certain paper different characteristics: better luster, better opacity, better quality."

The use of agricultural fibers also entails other advantages. For instance, it is a product which renews itself yearly, it's located close to paper-mills, and often just outside of major cities. It also has the potential to become profitable by opening new markets; it can serve as a substitute for wood allowing forest reserves to be saved. Furthermore, the use of agricultural fibers has an important ecological advantage. In the process developed by Arbokem, the spent liquor residue (the leachates created when the straw is cooked) can be used as a fertilizer.

So, can large paper-factories soon be expected to develop new paper pulp from agricultural residues?

According to the CSPP's director, the factories are only equipped to produce paper from wood fibers so all their activities, including those in research and development, are directed to this end. The solution, which will soon need to be envisioned, is to create new types of companies which will produce pulp from agricultural residues and allow them to sell it to the large factories.

For the moment, however, a challenge must be met. New sources of agricultural residue pulp have to be produced at an equal or similar price comparable to wood pulp.

In the last century, the production of paper from agricultural residues was abandoned in the United States when Canada entered the paper-factory scene. The last factory

using cereal residues closed its' doors in 1950. The production of paper with wood fibre was, at the time, far more economical.

Today, however, the use of wood is increasingly expensive, especially due transportation costs. Also, the difference between the cost of the two pulping processes has diminished considerably over the years. It is, therefore, not only the ecology which favors the use of this new procedure, there is also the economic motive.

The Patagonia House of California is the first "market" for Arbokem. This important publishing company sells its services under the ecological banner. It publishes magazines, brochures and tabloids. One of their publications is aimed at American congressmen. So, there is no doubt that Patagonia and Arbokem will deploy all their energy to sensitize this audience into choosing the commercial and ecological virtues of their product.

Information

For more information concerning the Arbokem procedure contact CSPP director Pierre Lavoie at (819) 372-0202 or Paul Pellerin of the Quebec Ministry of Natural Resources at (418) 643-6440.

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