



Domtar's Peter Gilbert (at right) holds a handful of "devilweed" — the U.S. Drug Enforcement Agency's term for hemp. Gilbert and his associates at Domtar, first to bring 100% recycled paper to market, are now championing

the use of "tree free" fibres for paper production, beginning with the recent introduction of "Weeds", an uncoated stock which is produced from a mix of bagasse (a derivative of sugar cane) and hemp.

seeing
the
forest
for
the
trees

domtar
launches
new
brand
of
"tree-free"
paper

by
dinah
tolton

Peter Gilbert laughed.

I had just called him my hero, but Peter was quick to point out that this story really wasn't about him. Rather, it was about marketing and team members who had worked hard on researching an environmentally friendly paper product made right here in Canada.

When Gilbert finished his studies at Concordia University in 1990, he landed a position at the head office of Domtar in Montreal. While working in developing and marketing recycled paper products, he heard about the Domtar mill in St. Catharines, Ontario and its push into research on new ideas in recycling. In 1992 he asked to be transferred there to be closer to the development of this next generation of recycled products.

During 1992 and 1993 the paper market was going through a green craze and Domtar's St. Catharines mill was creating products such as natural kraft envelopes and 100% recycled file folders. Domtar research had proved that a recycled paper such as its Sandpiper brand could be made stronger by adding used disposable diapers.

Sandpiper, a premium writing text cover, is acknowledged as the first 100% recycled paper brought to market. Peter Gilbert was involved in this paper's evolution from its earliest stages, and he was instrumental in adding seven new colors to the product line. Kaos, distinguished by its random white flecks, is also a recycled paper developed by Domtar.

September of 1998 saw Peter Gilbert and Russ Hutchings, product line managers, furthering work on new product development. Improving the financial health of the mills became a major motivation for setting up focus groups to determine a market for a totally "tree-free" paper.

Environmental legislation has had

quite an impact on the pulping industry, with many mills needing to make large capital investments to meet new regulations. Higher power requirements and the ever increasing cost of chemicals has reduced profits in the papermaking business, driving the need to find less expensive raw materials to furnish paper machines.

FOCUS GROUPS SPUR DEVELOPMENT

Designer focus groups conducted by Domtar in three cities — Toronto, Boston and Los Angeles — were asked which papers they thought would sell, about their awareness levels of existing tree-free paper, and for opinions on pricing and quality. They felt that any new paper should be priced at the same levels as Domtar's Sandpiper and Kaos — and responded emphatically with regard to a willingness to purchase a tree-free paper over a recycled paper if the performance was equal or better. The designers also reacted very positively to the concept of using a seasonally harvested crop.

When the groups were asked if more than 50% tree-free fiber would make a marketable paper, they responded that the paper should be 100% tree-free. All were in favour of environmentally safe production. This feedback sparked research to begin developing a totally tree-free paper recipe.

At the end of 1998 the Domtar Senneville mill which houses the Domtar research facility was asked to research all possible tree-free fibres; the choices were kanaf (a long stock-like bamboo), switchgrass, flax (wheat leftovers from which straw is produced), bagasse (residue from sugar cane), and different sources of industrial hemp. The two that seemed to work best were bagasse and hemp.

Krishan Goel, analytical manager at Senneville, was particularly excited about this project. With his background in India, he was quite familiar with seeing different fibres being used in paper production.

In many countries overseas, paper manufacturing plants are smaller and use tree-free fibres. Hemp is especially preva-

lent outside of North America, not having been banned as it is in the United States.

THE ROPING IN OF HEMP

The oldest piece of hemp paper ever found was located in a tomb near Siam in the Shensi province of China in 1957. It was dated between 140 and 87 B.C.

Hemp was used extensively in Europe for the rope used on sailing ships. It has been in North America for centuries, the origins perhaps being the Chinese or Viking explorers who depended on it for their sails and rigging. Paper in the United States was originally made with used cloth rags containing hemp and up until two hundred years ago, most clothing was made of hemp and flax. With the onset of the industrial revolution, demand for pulp for use in paper production became greater than the supply of cloth rags could keep up with. In 1863 Stanwood and Tower invented the first pulp paper made from wood.

There seemed to be several factors weighing against hemp production, one of them being the fact that it is a difficult fibre to cut. Competitors to hemp producers such as the cotton industry were able to advance their technologies far beyond what had been established for the hemp industry, making their products less expensive to produce.

During the 1930's, an American university came out with a very favourable report about hemp. The findings showed that one acre of hemp could grow as much pulp for paper as four acres of trees. How-

ever the Hearst Corporation, which had considerable holdings in forestry and saw hemp as a threat, responded through intensive lobbying efforts by painting an unfavourable relationship between hemp and marijuana. Through Hearst-influenced politicians, and bolstered by smear campaigns (epitomized by such movies as *Reefer Madness*), the hemp industry was lobotomized. Farmers — who had previously been encouraged to grow hemp — were shut down. This, in spite of the fact that historically it had been mandatory for farmers to grow hemp since it was such a useful commodity. Hemp production in the U.S. was effectively eliminated by the Marijuana Tax Act of 1937 which doomed the domestic growth of cannabis.

THE POWER OF THE LAW

To this day the United States Drug Enforcement Agency still will not regulate hemp crops. A twofold irony is that first, hemp is not marijuana; in fact, when grown within 7 1/2 miles of a marijuana crop, hemp reduces marijuana's potency by half. Second, the DEA purportedly makes millions of dollars with hemp products, yet simultaneously uses millions in government funds to spray roadside

hemp weed in order to rid the world of this "devilweed". In Canada many small farmers have stockpiles of hemp, yet cannot sell it due to the fact that there is no industry to deal with the pulping and use of hemp.

In 1998 the commercial production of industrial hemp became legal in Canada. Industrial hemp refers to varieties of the cannabis plant having a low content of THC, not to be confused with cannabis in which the psychoactive ingredient is THC (delta-9 tetrahydrocannabinol). Regulations define industrial hemp as the plants and plant parts of cannabis whose leaves

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and flowering heads do not contain more than 0.3 percent THC, including derivatives of the seeds such as oil and seed cake.

Although hemp crops require a fertilizer, hemp itself is actually a magnificent herbicide. Its stalks grow so quickly that any weeds which try to grow around it are suffocated before they reproduce.

Advocates point out that, if legalized, hemp could potentially displace cotton, which is usually grown with massive amounts of chemicals — in fact, 50% of all the world's pesticides are used on cotton. Hemp's long fibres allow hemp paper to be recycled several times more than

wood-based papers, whose fibres become shorter and shorter each time it is recycled. Its natural brightness diminishes or even eliminates the need to use chlorine bleach. And the yield from 10,000 acres of hemp would equal over 40,000 acres of pulp-wood lands.

Not only that, but since its roots run deep into the ground, hemp is a marvelous rotation crop providing natural cultivation of the land. It can also be used for many other products such as foodstuffs and clothing. If the growth of

hemp was supported by government agencies, there is no question that it would benefit both farmers and consumers.

Sugar cane, another wonderfully renewable resource, produces an alternate paper fibre called bagasse. Bagasse is the refuse in sugar mills, the material that is left from the sugar cane plant after the juice has been extracted. Most sugar mills burn the bagasse in their boilers to generate the steam required for process. For papermaking, this low-cost fibre source can be purchased from sugar mills for the price of the equivalent heating value. However bagasse has not been used extensively in the U.S. and Canada where there are not many sugar mills.

Ironically, there is little pressure on the U.S. to search for alternative paper sources since it has access to a huge supply of wood pulp — from Canada, of course.

DOMTAR'S TREE-FREE INITIATIVE

After narrowing their choices down to hemp and sugar cane fibres, four or five initial trials were run by the Domtar Senneville research team and a search for suppliers was undertaken.

Marlene Watson, purchasing manager at Domtar, was involved in sourcing the fibres. She worked with both Kenex in Ontario and with overseas sources to find the two pulps which were needed. A new uncoated paper product emerged from Domtar's research: "Weeds" is a designer grade stock made from seasonally renewable non-wood fibres consisting of 15% hemp and 85% sugar cane.

Peter Gilbert admits that a coated tree-free stock isn't likely to be available for quite some time. Production of such a product would hinge on local hemp pulp becoming much more cost-competitive with groundwood, hardwood and softwood fibres. A coated magazine stock from alternative fibres would also require a mill producing uncoated stock to supply a base sheet to a coater, a very expensive proposition which would make the end prod-

uct much more costly than current coated stocks. Most coated magazine stocks are currently made from coated groundwood (basically newsprint with a coating) which is a very inexpensive fibre/paper source.

The American market consumes 75 million tons of paper each year, of which 20 million tons are recycled. But ironically, there is little pressure on the U.S. market to search for alternative paper sources since it has access to a huge supply of wood pulp — most of it coming from Canada, of course.

Gilbert hopes that Domtar's foray into the promotion of tree-free papers will spread throughout the market as quickly as the "devilweed" that is in his products. ■

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