

Industrial hemp: background notes

In 1994, researchers in Canada began raising the first legal crops of industrial hemp to be grown in North America in nearly 50 years. This agricultural research, done under strict permits from Health Canada, was followed in 1998 by the Industrial Hemp Program, under which farmers in Canada may obtain licenses to grow hemp commercially. In recent years, a few states in the U.S. have passed similar legislation. Despite the fact that hemp is only now being reintroduced, it has a lengthy history in North America, reportedly beginning in the Acadian region of Nova Scotia when Jacques Cartier's apothecary brought hemp seeds from Europe in 1606. During the 1600s, the new colonies in North America were under contract to supply hemp fiber for the sails and rigging used on the ships of the French and British navies. By 1630, hemp had become a staple crop in both the United States and Canada, and many hemp farmers and mills prospered. The long outer fibers of the plant were used to make clothing, cordage and paper, and its seeds and oil were used for cooking and lighting.

Hemp continued to be a profitable crop until the late 1700s. However, with the advent of steam power, which reduced the need for sails and rope, and with the invention of the mechanical cotton gin, which made cotton fiber more cost-efficient than the more labor-intensive hemp fiber, the market for hemp declined. Demand for hemp fiber was further threatened by the development of chemical-mechanical processes of pulping trees for fiber. Similarly, the invention of synthetic materials made from petroleum reduced the market for hemp cellulose and hemp seed oil.

Industrial hemp farming might have remained uneconomical had it not been for the invention, in 1917, of a fiber-separating machine called a decorticator. This device reduced the labor needed to separate hemp fibers and made available the previously unused short-fiber core of the hemp stock. These new efficiencies in processing hemp offered the potential of hundreds of new hemp products and promised farmers a "new billion-dollar crop."

The resurgence of industrial hemp in the 1920s was short-lived, however. It is now believed that leaders in the chemical and pulp and paper industries, threatened by hemp's new industrial possibilities, set about

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to discredit it by equating it in the public mind with its recreational cousin, marijuana. Up until that time, the clear distinction between industrial hemp and marijuana had always been acknowledged. While both varieties are known in scientific terms as *Cannabis sativa* L., industrial hemp has little or none of the chemical tetrahydrocannabinol (THC) that gives marijuana its recreational and pharmaceutical potential. The lower level of THC in industrial hemp (one percent or less) is a natural genetic variation developed through selective breeding, and it eliminates the possibility of the plant being used for recreational purposes.

Despite this known difference between industrial hemp and marijuana, there were massive propaganda campaigns in the United States during the late 1920s and early 1930s to incite fear of marijuana and to convince the public and the government that industrial hemp and marijuana were the same thing. Stories appeared in newspapers about immigrants smoking marijuana and subsequently stealing, vandalizing and even committing murder. Such stories, now believed to be fabricated, made their way to Canada where there were debates in the House of Commons about the danger of marijuana falling into the hands of children.

In 1937, the United States enacted the Marihuana Tax Act to ban marijuana. Although the Act was not intended to interfere with industrial hemp, its effect was to create so much suspicion and red tape that hemp farms and factories were put out of business. Canada followed suit in 1938, banning both the recreational and industrial varieties of *Cannabis sativa*. In both countries, the possibility for further development of a legitimate industrial hemp industry was eliminated, and the distinction between industrial and recreational hemp was blurred in the public mind. It is this failure to distinguish between the two varieties that is the cause of the present controversy.

Hemp today . . . and tomorrow?

This "billion-dollar crop" is now beginning to resurface as farmers look for new sources of income and North Americans become more concerned about the

environmental degradation caused by the pulp and paper industry. The attention that hemp is gaining is in large part due to its potential as an alternative to wood-fiber paper and petroleum-based products. Hemp plants produce two types of fiber, bast and hurds, which have different uses. Bast fiber is a material of very high quality that can be used in textiles and premium paper products. The hurds can also be used for paper, as well as for animal bedding, insulation and construction materials. Some construction materials made from hemp are twice as strong as wood and concrete. Hemp seeds can be eaten or crushed for oil that can then be used in food, cosmetics, paints and other commercial products, such as clean-burning diesel fuel and biodegradable plastics. It is estimated that hemp has thousands of commercial uses.

An exciting aspect of the hemp plant is that it has the potential to alleviate some environmental problems. One of the main problems associated with pulping tree fiber is the use of chlorine compounds to dissolve lignin, the organic glue in wood, and to bleach the fibers white. Hemp contains less lignin than wood, and its fibers are naturally light in color, thus reducing the need for dissolving and bleaching compounds. Where bleaching is required, hydrogen peroxide has been shown to be a less damaging but effective agent.

Another major advantage of growing hemp instead of trees is its superior yield. One hectare of farmland can produce approximately 10 metric tons of hemp (total dry matter) in one year. In the same time, one hectare of softwood forest produces less than two metric tons of fiber. Put another way, one hectare of hemp annually yields five times as much fiber as one acre of trees of harvestable age (trees require a minimum of 20 years' growth for paper purposes.) As the public becomes more aware of the soil erosion and the loss of wildlife habitat and water quality caused by the pulp and paper industry, more attention may be paid to hemp as a less harmful alternative.

Besides attractive yields, hemp offers other environmental advantages for those concerned about conventional farming practices. Hemp requires less water

than cotton and it has few natural pests, thus requiring fewer pesticides than cotton and many other crops. It grows so densely that it effectively chokes out competing plants, thus reducing or eliminating the need for herbicides. In fact, hemp was often grown to clear fields of weeds prior to planting other crops. The crop does require fertilizer to facilitate fast growth, but animal manure has been found to be the best fertilizer for hemp. This does not alleviate environmental problems associated with excess nitrogen, but it reduces the need for farmers to purchase chemical fertilizers.

Switching to hemp could also resolve another dilemma: North American farms produce too much food. Overproduction lowers farm gate prices and drives marginal farmland out of production. Thus hemp and other fiber crops, such as switchgrass, could invigorate the economies of less productive farm regions. Indeed, the fact that hemp is a bulky product to transport means that hemp fields and mills will have to be in close proximity. This could help to develop regional self-sufficiency.

Hemp advocates fear that if we do not develop a commercial hemp industry soon we will miss out on a huge economic opportunity. Many European countries have been growing commercial hemp for years; and while industrial hemp can now be grown in Canada and a few U.S. states, farmers operate under strict government regulations. It will be impossible to develop a hemp industry and define markets for hemp products until we are able to grow large-scale commercial plots. It is presently in the hands of the government to remove restrictions for commercial crops. Your participation in this debate will help to determine the future of industrial hemp in this country.

Works Cited:

"Teaching Green: The High School Years". Pgs. 133 - 138.