National Industrial Hemp Strategy

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Executive Summary

Growth of the Canadian Industrial Hemp Sector

The history of hemp cultivation is as old as the history of civilization. In North America, hemp was a crucial crop during the colonial period, and it continued to be produced right up to and through the Second World War. A combination of regulatory pressures and changing public perceptions around drug use led to the disappearance of domestic hemp cultivation in North America in the years following WW II.

In 1998, Canada joined the large international community of hemp producers by permitting the production of industrial hemp, under a carefully monitored regulatory process. While the growth of the Canadian industrial hemp sector over the past decade has been uneven and at times fraught with challenges, as would be expected from a fledgling industry, there is considerable cause for optimism:

- The market for hemp seed materials for human health, nutrition, and personal care applications is strong and growing. Market price for a drum of conventionally grown hemp oil is approximately $1600 Cdn, with organic hemp oil valued at approximate $2500 a drum (Spring 2008).
- A favourable court decision in 2004 re-opened the US market, which had been effectively closed in 2000 by the US Drug Enforcement Agency (DEA). This has allowed for substantial and rapid gains in US exports.
- Recently, there has been dramatic growth in Canadian industrial hemp exports, with the US being the primary importer. Hemp seed exports increased 300% from 2006 to 2007. Hemp oil exports were also impressive, increasing 85%. Hemp fibre exports increased 65%.
- The knowledge base being developed by producers and researchers is expanding rapidly, with experienced farmers now consistently producing good yields.
- There is an increasing base of experienced organic producers meeting the strong market pull for organic hemp products, some of whom are now achieving yields that rival conventional farming techniques.
- Acreage under cultivation, while still showing significant annual fluctuations, is now regarded as being on a strong upward trend.

While the growth of the Canadian hemp sector over the past decade has been driven by market demand for hemp seed products, hemp has a broad range of potential product applications. The three primary components of hemp – bast fibres, hurd, and seeds/oil - each have attributes that provide distinct competitive advantages in a multitude of food and health, fibre, oils, and personal care applications. As technologies for hemp processing become commercialized and mature, there is reason to anticipate market penetration by hemp based products in such applications as biocomposites (including bioplastics), textiles, and industrial oils.

The National Industrial Hemp Strategy

Recognizing the need for concerted sector-wide approaches to overcoming roadblocks to expanded commercial production in the Canadian industrial hemp sector, Manitoba Agriculture, Food and Rural Initiatives (MAFRI), the Composites Innovation Centre (CIC) and the Canadian Hemp Trade Alliance (CHTA) have spearheaded the development of the first national industrial hemp strategy for Canada. Working with a broad cross-section of stakeholders representing producers, processors, researchers and research institutions, and the policy community, the goals of this National Industrial Hemp Strategy include:

- Aligning the value chain players towards common goals that will maintain the competing edge of the Canadian industrial hemp sector
- Defining coordinated actions that will open up access to new markets for both seeds and fibres, expanding the sector and increasing the farm gate income of producers
- Attracting more investment into R&D and commercialization in the hemp industry.

The National Industrial Hemp Strategy has defined the following vision and mission for the sector:

Vision	Canada is the global leader with respect to total hemp crop utilization offering solutions along the entire value chain.
Mission	To create an economically sustainable Canadian hemp industry, benefiting all stakeholders along the value chain and enhancing the nation's health and natural environment.

Major Opportunities and Challenges

The process of developing the National Industrial Hemp Strategy, involving comprehensive consultation with Canadian hemp stakeholders, identified major opportunities and challenges for the industry, examining it in terms of three product categories: health and food (including personal care products), fibre and industrial oil applications, and breeding and production.

Health and Food – Opportunities

- Demographic and societal trends leading to increased interest in natural health products and "healthier for you" foods.
- Increasing recognition of the nutritional and health properties of hemp, including the presence of many different bioactive ingredients in hempseed that have shown promise in disease prevention and reduction.
- Emerging markets, such as pet foods and products, and gluten-free products.
- The rapidly expanding market for natural, organic personal care products.

Health and Food – Challenges

- Lack of clinical research specifically on the health benefits of hemp seed and oil.
- The need to educate the public about the reality of THC in hemp products.
- The Canadian regulatory environment for foods with health claims, both for marketing and for product approval, which is not as favorable or transparent as in other global jurisdictions.
- The need for research into hemp food formulations, required for uptake by mid to large size food companies.
- The need to achieve generally recognized as safe (GRAS) status for hemp with the US Federal Department of Agriculture.
- The lack of approval from the Canadian Food Inspection Agency for the use of hemp and hemp products in animal feed.

Fibre and Industrial Oil – Opportunities

- There is a world of new and emerging markets, driven by the increasing viability of substituting hemp-based bioproducts for petroleum-based products, based on emerging technology platforms and the increasing costs of fossil fuels. There are numerous short, medium and long term opportunities for hemp-based products to make significant inroads in these markets.
- Emerging processing technologies are unlocking new industrial applications. With domestic commercial processing of bast fibres expected to come online in 2009, a whole range of natural fibre applications are enabled. Similarly, new product applications are being brought to commercialization.
- There is increasing market demand for environmentally conscious products. Hemp has promising applications in a wide range of green building products, and the substitute of hemp-based products for fossil fuel-based products will deliver significant environmental benefits.
- With the market for hemp seed products expanding, there are increasing amounts of hemp fibre and hurd available for industrial purposes.

Fibre and Industrial Oil – Challenges

- There are a number of challenges relating to the nature and structure of the market for hemp, including EU subsidies. These subsidies distort the real market value and hence the nature of the market opportunity for hemp. Other market challenges include lack of access to risk capital and competition from imports of jute and sisal, and other natural fibres.
- The limited processing facilities in Canada pose a significant threat to the long term growth of the sector.
- Many government stakeholders have not yet demonstrated a significant commitment to hemp as a crop. As such, they are funding other “higher” profile products, and provincial agricultural departments may have other priorities, making funding more difficult to access for hemp.

- Potential issues with production and supply threaten the ability of the sector to grow rapidly in response to potential market demand.

Production and Breeding – Opportunities

- Significant benefits can be realized through modest continued investment in developing best management practices for industrial hemp.
- There are a number of opportunities to breed hemp for specific characteristics such as the introduction of a retting gene, increased water, less lignin, increased pectin and maximizing fibre. These activities will be aided by gene mapping and other activities.
- There are a number of emerging opportunities for Canada to export germplasm, with the international community looking at Canada for our hemp genetics. In the near term, breeding for the US market may afford significant opportunities, if current US prohibitions on industrial hemp cultivation were lifted.
- There is a potential opportunity to create and derive additional revenue for the production of hemp from green markets (e.g bioremediation, carbon credits).

Production and Breeding – Challenges

- Most manufacturers in North American are moving to use rotary combines. The use of rotary combining damages hemp fibre.
- There are issues in protecting the hemp cultivar, including the potential for cross contamination of cultivars.
- The cost and labour involved in testing and proving seeds.

Strategic Areas for Action

In order to capitalize on identified opportunities for the growth of the Canadian hemp sector, the following strategic areas for action were identified through the extensive stakeholder engagement undertaken in developing the National Industrial Hemp Strategy. Some of these strategic areas for action are common to all of the industrial hemp sub-sectors, while others are specific to a particular industrial hemp industry.

Common to All Platforms

- Work towards improving access to risk capital, including educational efforts targeting the sources of capital, and ensuring that successful projects are well publicized.
- Develop a more detailed understanding of domestic and export hemp markets.
- Continue to work with Health Canada vis-à-vis optimizing the regulatory regime to ensure required oversight while minimizing the cost to producers.
- Support efforts to incorporate sustainability criteria into Canadian policy, with the goal of realizing competitive advantages for hemp and other biomass based products as compared to fossil fuel-based products.

- Work to maintain access to the US markets, including maintaining a close watching brief on the US situation, the forging of alliances with key US industry stakeholders and other industrial hemp proponents
- Continue work on low THC breeding, and broad-based education campaigns as to the benefits and safety of industrial hemp.
- Develop multiple value propositions that make hemp attractive versus competing crops.
- Grow the national industrial hemp network, to establish a strong and unified national industry voice, and a body to act as proponent for many of the actions outlined here.
- Establish increased market stability through improved relationships between producers and processors more closely aligning supply and demand.
- Communication and marketing efforts targeted toward market acceptance from potential end-users of hemp products, including consumer awareness campaigns explaining the benefits, and assuring the public that it is in no way a source of illegal drugs. Industrial end-users will also need targeted campaigns to make them aware of the benefits offered by hemp feedstock.
- Ensure access to highly qualified people for industry stakeholders, involving the identification of required skill sets and collaboration with academia to meet identified industry needs.
- Work with the relevant links in the value chain to ensure required infrastructure (storage, availability of harvesting equipment, pre-processing capacity, and others) keeps pace with the growth of the industry.

Health and Food

- Work with the Canadian Food Inspection Agency (CFIA) to achieve regulatory approval for the incorporation of hemp nutrients into animal feed and treats.
- Research to fill the existing gaps in the knowledge of the health benefits of hemp. Credible evidence of health benefits will be needed to maintain and expand the market for hemp food and health products over the long term.

Fibre and Industrial Oil

- Develop commercial bast fibre processing in Canada. The lack of commercial scale bast fibre processing in Canada is a primary barrier to growth in this sector. Production of sufficient (commercial) quantities of high quality bast fibre and hurd is required to enable the development of downstream applications.
- Identify end-user interest in utilizing hemp as a component of their product. While the broad spectrum of potential industrial hemp products are increasingly understood, there is considerably less understanding of the potential industry receptor capacity interested in commercializing these products.
- Establish test methods of Canadian hemp fibre for specific product applications.
- Develop technologies and methodologies for the increasing variety of market applications.
- Develop fibre grading standards, which are an important component in providing hemp product manufacturers and downstream users of hemp fibre with the stability of supply and quality assurance that they require

- Develop a cost-effective oil processing system.
- Develop market applications for co-products of the hemp decortication process. While much of the attention is focused on hemp oil and bast fibres, it is imperative that valuable markets be developed for all co-products of hemp processing, including short fibres and hurd, hurd only, fines and dust, and seed meal (left after oil extraction).

Breeding and Production

The areas for strategic action in breeding and production are all oriented towards realizing increased yields per acre of hemp crops, optimized for desired applications. These areas include:

- Bioresource engineering, to address properties of hemp such as tough stems and growth that may reach several metres tall.
- Ensure that sufficient supplies of hemp seeds are available for a variety of cultivars, covering the full range of Canadian growing conditions.
- Optimize and develop cultivars for specific Canadian growing conditions.
- Continue the development of best management practices around hemp cultivation, including response of hemp to fertilization, seeding rate, row spacing, harvest management / improved practices, and retting.
- Promote Canadian-bred cultivars internationally to help carve a distinct niche for Canada in the global industrial hemp industry.