

Industrial Hemp

(*Cannabis sativa* L.)

Introduction

In this factsheet we return to an old-new crop called hemp. As of March 12, 1998, it became legal to grow hemp in Canada after a 60-year ban, under Health Canada (see details pg. 14).

Hemp was historically grown in the U.S. and Canada until the 1930s, when the U.S. market suffered due to the development of synthetic fibres (such as nylon), as well as the improvement of technology for making paper from trees. Hemp, in the form of marijuana, was also increasingly identified as an illicit drug. Though it was grown during the Second World War to produce rope, stringent taxation, in the form of the *Marijuana Tax Act* of 1937, insured the eventual demise of the hemp industry in the U.S. In Canada, hemp was grown in many areas, including B.C. until 1938. Then, following the lead of the U.S., the *Opium and Narcotic Control Act* was introduced and it became illegal to grow hemp in Canada.

On March 10, 1996, the Food Production and Inspection Branch of Agriculture and Agri-Food Canada issued the following statement in a directive numbered D-96-03. "Health Canada now recognizes the difference between these two types of Hemp but regulates who can produce a crop for fibre." They were discussing the plant *Cannabis sativa* which most will recognize as marijuana. Hemp is in fact the same plant (genus & species) but has taken a different path of development over the years. This divergence has led to the relaxation of rules to where licences to grow industrial hemp in controlled test plots were granted in 1996; the first in B.C. was issued in June 1997.

In all marijuana and almost all hemp cultivars there is a drug called delta-9 tetrahydrocannabinol (THC) produced naturally by the plant. The difference is that hemp must be, by new regulations, less than 0.3 percent THC, where some marijuana cultivars are now over 25 percent THC in specific parts of the plant. They are also grown in a dramatically different fashion, hemp being close together for tall plants and marijuana far apart to give a bushy plant.

Since the Second World War the main areas of hemp production in the world have been India, China, Germany, Hungary, Poland, England, Holland, and France. Hemp oil has mainly come from China or Chinese hemp seed has been crushed in Chile and then marketed throughout the world.

Specialty Crops FACTSHEET



BRITISH
COLUMBIA

Ministry of
Agriculture and Food
162 Oriole Road
Kamloops, BC V2C 4N7
Phone: (250) 371-6059
Fax: (250) 828-4631

Revised September 1999

The oil has primarily been marketed as specialty oils used mainly in the cosmetics and personal use industries. The hemp fibre in France originally was used in the textile industry but is now mainly used in specialty papers that can take advantage of its high tear and wet strength; for instance, cigarette and filter paper, nonwovens, security, art papers, currency and tea bags.

There are reported to be 23 paper mills in the world that use hemp fibre for paper production with an estimated production volume of 120,000 tons per year which is about .05 percent of the world's pulp production. Most of these mills are in China and India and tend to use a mixed fibre source. Those mills located in the western world produce specialty papers. Eastern European Countries have used most of their hemp fibre production in the textile industries and are now exporting increasing quantities of high quality material.

The increasing interest in hemp in part is being driven by environmental concerns about harvesting of forest resources. Reports on volume of fibre produced from hemp compared to trees are inconsistent. Some reports claim fibre production from hemp per year per hectare is three to four times that from trees. Other reports indicate a less favourable ratio for hemp.

The Hemp Plant

Hemp, *Cannabis sativa* L. is a member of the hemp family Cannabaceae. All plants in the world are given a specific, usually bi-nomial name in Latin, that defines it from all other plants in the world. Scientists use this descriptor, as common names vary all over, even in one country. Thus for an example the name "*Cannabis sativa* L. Unico B", describes the genus, species and cultivar or variety, to everyone in the world. The L. is the initial of the person who named hemp as the name we use today.

The plant is generally dioecious in that it has separate male and female plants. There are a few monoecious cultivars now that have both male and female flowers on the same plant. The monoecious aspect is not genetically stable so this has to be maintained by plant breeders on an ongoing basis.

Hemp is an annual growing up to 5m in height (16 ft). It is one of the most efficient plants known for its ability to utilize sunlight to photosynthesize. The drug (THC) is found in glandular hairs on the leaf, stem and the unfertilized female flowers.

Hemp cultivars have been selected for seed and fibre production and the THC levels are very low to zero in a couple of French varieties. Male plants die soon after flowering while female plants live to mature seed stage. This is why monoecious plants are desirable for seed production, as all plants would be at the same maturity at harvest time, and all bear seeds.

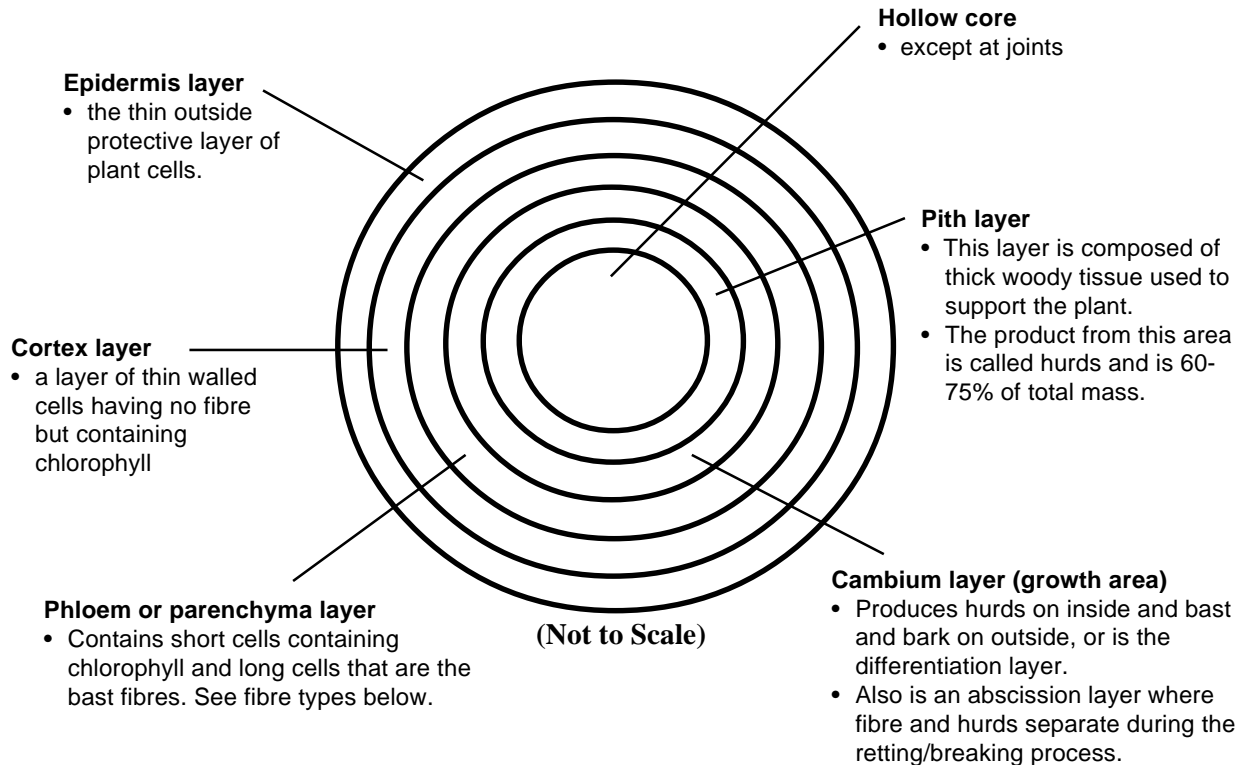
The origin of hemp is thought to be Central Asia, where it can be found in the wild from Iran to southern Siberia. Common names for hemp in various countries are, Austria and Germany = hanf; Chile and Spain = canamo; China = ma; Denmark = hanp; Finland = hanpu; France = chanvre; Hungary = kender; Japan = taima; Netherlands = hennep; Poland = penek; Russia = konopli and Yugoslavia = konoplja.

As a medicinal plant, various hemp/marijuana plant parts are said to relieve constipation, pain killer, sleeplessness and nervous exhaustion. It has been suggested that hemp also eases menstrual pain, migraines and rheumatism. In some areas (where legal) it is used for the reduction of effects from radiation and chemotherapy. *Note: No recommendations are implied in the above list.*

Because of hemp's 'illegal' status in many parts of the world, modern techniques of plant breeding and genetic selections have not been done. When compared to corn and wheat for example, the development of hemp as a crop is in its infancy.

The following (Figure 1) is a not-to-scale cross section of a hemp stem showing the different layers and uses of each layer. A further breakdown of the major categories of products made from hemp is available on page 8.

Figure 1 The Hemp Stem (Cross Section)



Fibre Types

Total fibre content is approximately 25-35 percent of stem dry matter, depending on variety.

1. Primary bast fibre - long and low in lignin
2. Secondary bast - intermediate and high in lignin
3. Libriform - short and high in lignin

Details on the make-up of hemp are hard to find at present but some are in the book “The Cultivation of Hemp” mentioned at the end of this document.

Hemp has been found in tombs dating back to 8000 BC and is documented as early as 2700 BC in ancient Chinese writings.

Hemp Field Culture

- Hemp plants prefer semi-humid conditions with temperature between 14 and 27 °C for best results.
- Needs plenty of rainfall/irrigation (especially first six weeks).
- Is drought resistant once it is a few weeks old but mass is reduced and lack of adequate moisture also hastens maturity.
- Seedlings can endure -5 °C frost, mature plants to - 5 °C as well.
- Early plantings produce more mass for fibre production as it is a short day plant, maturing quicker as the days shorten in the summer and fall, so early growth is important. For seed production, later plantings may reduce stem length and mass.
- Hemp prefers well drained loam soils, as trials on heavy soils in Canada have not done as well. A soil pH over 6.0 is recommended, 7.0 - 7.5 preferred.

- Hemp is very sensitive to soil compaction.
- There is some suggestion that plants that are heat stressed may not set seed as well or even at all. This may affect where hemp can be grown for seed production. Trials have been inconclusive.
- Hemp is cross pollinated by wind and pollen regularly travels long distances. It produces more pollen than any other cultivated plant.

Seeding Rates

Seed costs up to \$2,700/tonne. For fibre production (variety dependant) you seed 2 - 3 cm deep in rows 6 - 15 cm apart at a seeding rate of 55 - 70 kg/ha. This gives a plant density of 200 - 450 plants/m² @ emergence.

For seed production you seed 10 - 24 kg/ha which will yield a plant density of 50 - 120 plants/m² at emergence. Seed will be only about 80 percent viable after one year. It can be kept longer at storage temperatures of 2-3 °C.

Nutrient/Water Requirements

Hemp is similar to corn in its nutrient requirements. A shortage of nitrogen in particular can severely reduce fibre mass. Since no details are available for hemp, the following are suggestions only. These rates are suggested maximums and should be raised to this level in the soil, according to laboratory test results (see soil laboratory listings on page 9).

N @ 120 Kg/ha

P @ 100 Kg/ha

K @ 160 Kg/ha

Because of high biomass production these nutrients must be available to grow a good crop. Other macro and micro nutrients need to be there as well.

Much of this nutrient draw is returned to soil (up to 70 percent) because of:

1. Leaves falling off stalks during growth.
2. Trimming at harvest time.
3. Retting process (if done in the field).
4. Roots remaining in soil.

Hemp needs more water and nutrients to grow than grain crops and the better the soil, the probability of a better yield is increased.

Hemp requires approximately 30 - 40 cm (12-15 in) water per each growing season or rainfall equivalent to produce a crop. Because of the plant height, the type of system almost has to be a large overhead gun. Wheel row or hand move systems would only work for the first few weeks. While tall wheel row systems are available, they are not common in B.C. The plant has been measured to grow 12 inches in a week.

General Pests of Hemp

The suggestion that hemp requires no pesticides is not true, as is the idea that hemp requires no nutrients from the land and will grow anywhere.

Starting with the importing of seeds, hemp must be certified to be free of at least four diseases and one parasitic weed species (as a seed contaminant). Hemp is also known to have many insect pests, including a hemp stem borer and bertha army worms.

Pest problems are always aggravated by large monoculture situations, where hundreds or even thousands of acres are grown in one area. Pests in the general sense refer to insects, diseases, weeds, nematodes, slugs and mice. Pesticides are chemicals, (either organic or not) that will eradicate or control these pests. There are no pesticides registered for hemp. Hemp appears to be more free of pests than some other crops.

As far as weeds are concerned, if a hemp stand is healthy and even, weeds can be reduced to virtually zero under the hemp canopy. If there are spaces, weeds will grow. There are no herbicides available for hemp at this time.

The original diesel engine was designed and did run on vegetable oils, one of which was hemp oil. Mineral oils have since replaced vegetable oils but the diesel engine will run on vegetable oils.

Harvesting

Fibre Type Hemp

- * The fibre is ready around the time the plant is finished producing pollen and first seeds start to develop. (This will vary somewhat on variety and maturity of fibre desired). If left much beyond this the fibre gets too coarse.
- * The goal is to achieve maximum stem yield at best quality. Because the plant is light sensitive, early plantings will produce taller crops and thus more fibre.
- * The stems cannot be chopped or broken up too much in the harvesting process as long fibres are desirable.
- * In the harvesting process you need to rett (rot) off the outside tissue of lignins and pectins: this is done in the field with time and water or by using a mechanical decorticator. There are differences of opinions as to which process is best (see below for types of retting).

Seed Type Hemp

- * The actual process of harvesting starts approximately six weeks after flowering or when it is determined that the seed is properly ripened.
- * The fibre from stalks grown for seed production is stiff, coarse and brittle, especially in the male dioecious variety as they died soon after pollination was completed. This coarse fibre may be good for fibreboard and other products, as it is stronger than younger fibre.

Retting

A process where water (moisture), micro-organisms or chemistry break down the bark tissue that binds the fibre and non fibre portions together making them easy to separate.

- 1. Dew Retting** – left in field where rain, dew and/ or irrigation is used to keep the stems moist. May take up to five weeks. Produces a coarse fibre with light brown colour.
- 2. Water Retting** – bundles are submerged in water where bacteria break down the pectin. Takes seven to ten days. Produces better quality fibre.
- 3. Warm Water Retting** – bundles are soaked for 24 hours then the water is replaced. Heat is then

applied to warm this batch for two to three days. Gives a very uniform, clean fibre.

- 4. Green Retting** – this type uses an all mechanical process to separate the component parts. This is used when the stem will be used for textile/paper and fibreboard products.
- 5. Chemical Retting** – chemicals are used to dissolve the pectin allowing the components to be separated. This shortens the time to as little as 48 hours when the next process can proceed. This produces a very high quality product.

After retting, the fibre is decorticated, scutched, hackled and combed — processes that separate and clean the component parts so each can be used. Equipment companies are continually working to improve these processes for efficiency and to lower costs.

Varieties

At this time it is not legal to grow your own seed in Canada. Seed has to be purchased from a seed grower or imported at a cost of about \$2,700/tonne. This will be reduced substantially when we can grow this crop as seed for propagation in Canada.

There are no North American varieties of hemp (other than some weedy types that exist in states such as Wisconsin from pre-1937 plantings), so selections have to be made by recent trials. There are many named varieties available and these fall into fibre, seed/oil, or dual purpose types. See Table 1 below for the varieties approved for the 1999 growing season. This list will probably change from year to year as new varieties are developed. The list for 2000 will be available from Health Canada (613) 954-6524 or www.hc-sc.gc.ca/hpb-dgps/therapeut.

The original blue jeans were made from hemp fibre as was the first U.S. flag.

**Table 1. List of Approved Cultivars for the 1999 Growing Season
*Cannabis sativa L.***

The following Industrial Hemp varieties are approved for commercial cultivation in 1999:

Variety	Country where maintained
1. Anka	Canada
2. C S	Italy
3. Carmagnola	Italy
4. Fasamo	Germany
5. Fedora 19	France
6. Fedrina 74	France
7. Felina 34	France
8. Ferimon	France
9. Fibranova	Italy
10. Fibriko	Hungary
11. Fibrimon 24	France
12. Fibrimon 56	France
13. FIN-314	Canada (Finland)
14. Futura	France
15. Kompolti	Hungary
16. Kompolti Hibrid TC	Hungary
17. Kompolti Sargaszaru	Hungary
18. Lovrin 110	Romania
19. Uniko B	Hungary
20. USO 14	Canada (Ukraine)
21. USO 31	Canada (Ukraine)
22. Zolotonosha 11	Canada (Ukraine)
23. Zolotonosha 15	Canada (Ukraine)

Processing

The pulping process for hemp is different from that for wood fibre. Wood fibre is very dense compared to hemp which allows for it to be economically transported long distances for processing. Although the volume of hemp fibre per hectare is comparable to wood in the long term, the annual harvesting area is much larger to achieve equal volume.

Traditional hemp processing plants are small, labour intensive, and quite polluting when compared to modern wood pulping operations. Since hemp production has been banned for decades, the technological advancements that have occurred in the pulping industry have not occurred for hemp pulping. There are several new experimental

laboratory processes that can process hemp pulp more economically and with significant reductions in pollution. At present none of these new pulping processes have resulted in the building of an operating plant.

The future of the Canadian hemp industry depends upon the development of an economical processing infrastructure. Estimates indicate this is at least three to five years away. The success of the industry will then depend on the development of markets for the fibre.

Hemp Products

General products – see Table II below

Products from Seed

Seeds are used to produce an edible oil which can also be used for fuel, paints, cosmetics etc. Seeds are 25-35% oil which contains 8 essential proteins and 3 essential fatty acids. Whole seed is also used in soups or ground for cakes etc., or as an animal feed. This oil is very low in saturated fats and is approximately 55% linoleic acid and 25% linolenic acid, considered a very good ratio. There appears to be a market for seed/oil at this time. Seed is the only part of the plant that is traditionally used for food.

Seed grain for oil is \$0.20 - \$0.25 U.S. per pound F.O.B. China. Quality of seed is poor.

Phytosanitary concerns are high. Demand for the oil is in alternative market in U.S. The price for organic oil sourced from Germany is U.S. \$11 - \$14/litre F.O.B. U.S. for eastern seaboard.

Yields are in the range of 1.54 - 2.64 tonnes/hectare of seeds (1400-2400lbs/ac). U.S. processors are willing to pay \$1,000 per tonne for clean harvested seed. An extraction rate of 35% converts to 226-388 litres per acre. Organic hemp oil sells for \$14 U.S. per litre or approximately \$3,395 to \$5,821 per acre. Oil pressing requires immediate cooling or nitrogen based storage.

Given the value of seed and the projected costs to produce it, it appears that the profit margin will be small. It is important that a grower has a market for the seed and the fibre before growing hemp to assure a good return. See estimated costs on page 11.

A by-product of oil production from seeds is protein meal which is quite popular in India and China as a food item. This product, which includes up to 25% protein, is also an excellent feed for cattle.

Products From Stem

There are many products made from hemp fibres, ranging from canvas shoes (from the word cannabis) to quality shirts and dresses. Some literature suggests that 50,000 items are made world wide from hemp fibres and seed. One of the oldest uses of hemp was for rope used on ships because it is quite resistant to the effects of salt water.

Varieties and the time of harvest determine the coarseness of the fibres, from very fine to coarse. Hurds are the non fibrous or woody inner layer of the stem. They are used for paper, rayon, fuel, cellophane, food additives, animal bedding, and building materials.

The whole plant can also be used for fuel, i.e. the production of alcohol, although this is not common at this time.

Permits to Grow Hemp

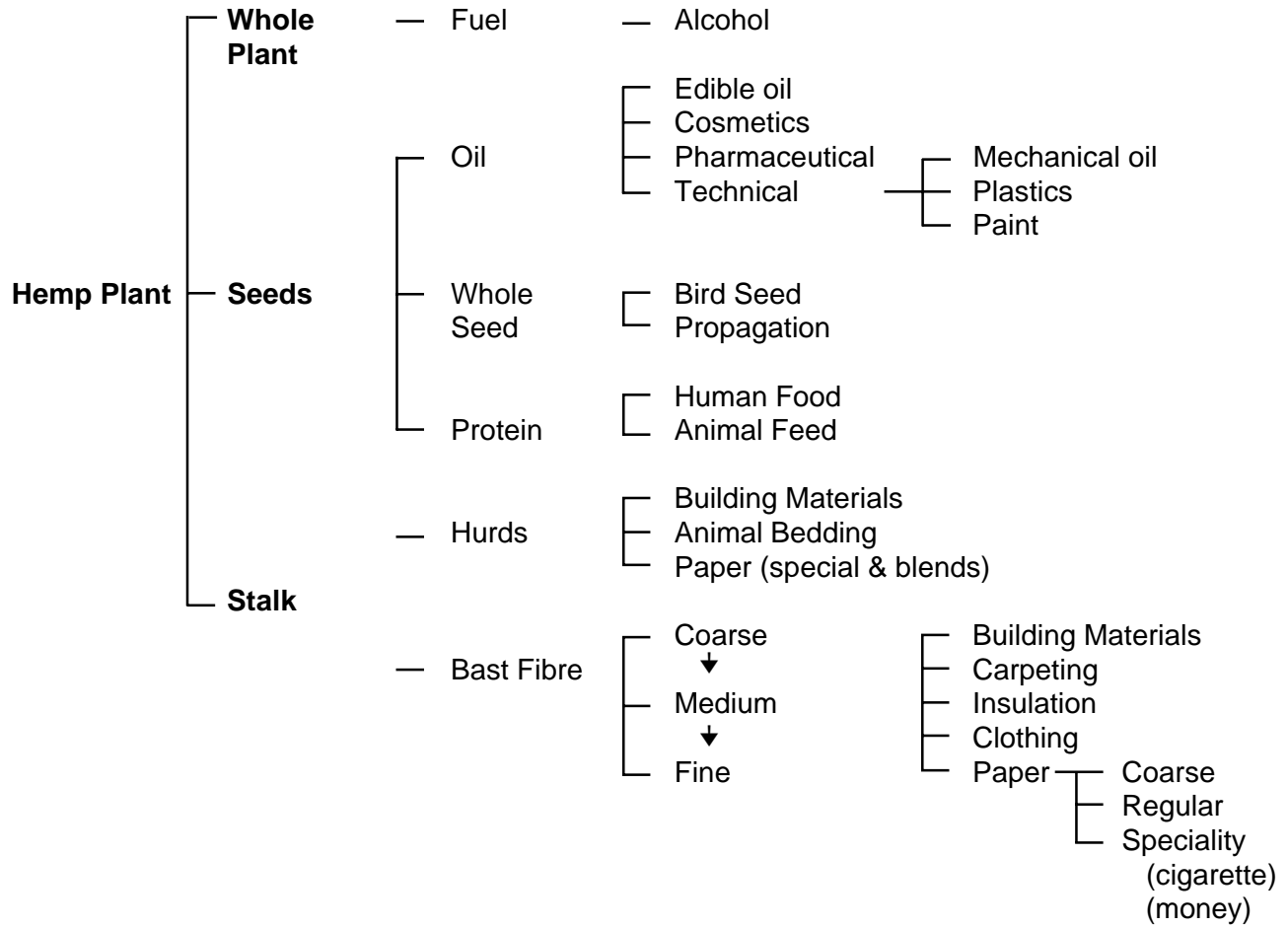
(March 1998)

A summary of regulations and where to write or call for more information is found on pages 12 to 14. As they are federal documents they have not been altered nor will we comment on them.

Seed is imported under regulations of the Canadian Food Inspection Agency (CFIA). The B.C. office is located in Kelowna at 1905 Kent Rd., V1Y 7S6, Phone: 250-470-4899. The CFIA directive that regulates this is #D-96-03 and is found on pages 15 to 20 of this document.

All these regulations will change somewhat over time and may disappear as hemp becomes a mainline crop but for now they are in place and must be adhered to. A review is slated for the year 2000.

Table II Product Flow Chart



Comparative Fibre/Pulp Products

HEMP

- ☛ Yield 4 - 12 tonne per hectare total yield depending on growing conditions
- ☛ Usable bast fibre is 35% of total or tonne per hectare (1.4 - 4.2 tonne per hectare)
- ☛ Current North American market price undetermined
- ☛ Zero infrastructure available

FLAX

- ☛ 1,000,000 hectares grown in Western Canada
- ☛ Yield of straw is 1.5 - 2.0 tonne per hectare
- ☛ Seed sold for oil at a current price of \$300/tonne
- ☛ Residual fibre straw is removed and baled from fields by purchaser
- ☛ Farm is paid \$6/tonne for fibre
- ☛ Advantage to farmer; no crop disposal problems
- ☛ Two US firms, Schweitzer-Mauduit and Acousta control flax fibre market

CULTIVATED HYBRID POPLAR

- ☛ Poplar will produce 1.5 tonnes in the Peace to 9 tonnes in the south of chip quality fibre per hectare per year
- ☛ Currently 2,000 hectares grown by Mac-Blo in BC on private land
- ☛ Goal of 10,000 hectares within 10 years
- ☛ Lease rate of \$150/hectare in coastal BC

Books

1. *The Cultivation of Hemp*

By: Dr. I. Bocsá, M. Karus

Retail Price: \$18.95 (US)

To order call: (800) 265-HEMP

Distributors: (707) 823-2800, Ext. *41

Email Orders: orders@hemptech.com

Hemptech

PO Box 1716 Sebastopol, CA 95473 USA

2. *Hemp Horizons*

By: John W. Roulac

Retail Price: \$18.95 (US)

\$24.95 (Canada)

Chelsea Green Publishing

PO Box 428

White River Junction, VT 05001 USA

Contacts

1. **Brian Johnson** –

Transglobal Hemp Products Corp.

(Vancouver Island)

Telephone: 250-384-4873 Fax: 250-388-4873

2. **Doug Brown** –

Westhemp BC (Lower Mainland)

Telephone: 604-732-8203 Fax: 604-732-8273

3. **Lee Wells** –

Granby Hemp Co-op (Grand Forks)

Telephone: 250-442-0333

4. **Rick Plotnikoff** –

Canadian Hemp Corporation

(dba-Canadian Hemp Farmers Association)

9175 Mainwaring Rd

Sidney BC V8L 1J9

Telephone: 250-656-4490 Fax: 250-656-8860

5. **Canadian Seed Growers Association**

P.O. Box 8455, 202-240 Catherine Street

Ottawa, ON K1G 3T1

Griffin Laboratories Corp.

#2-2550 Acland, Rd Kelowna BC V1X 7L4

Bob Rogers

250-765-3399 • 250-765-3556

Soils/water

Pacific Soil Analysis Inc.

5-11720 Voyageur Way

Richmond BC V6X 3G9

Bill Herman

604-273-8226 • 604-273-8082

General

Laboratories (THC Testing)

POS Pilot Plant Corporation

118 Veterinary Road

Saskatoon, Saskatchewan S7N 2R4

Contact: Paul Kolodziejczyk

Telephone: (306) 978-2853 Fax: (306) 975-3766

ORECL Research & Environment

Consulting Laboratories

30 Dawson Road, Unit B

Ste. Anne, Manitoba R5H 1C1

Contact: Dr. G.R. Barrie Webster

Telephone: (204) 422-9502 Fax: (204) 422-5879

Food Development Centre

810 Phillips Street

Portage la Prairie, Manitoba R1N 3J9

Contact: Theresa Almonte

Telephone: (204) 239-3150 Fax: (204) 239-3174

Maxxam Analytics Inc.

5540 McAdam Road

Mississauga, Ontario L4Z 1P1

Contact: Ms. Wendy Vainer

Telephone: (905) 890-2555 Fax: (905) 890-0370

Dr. Francois-Xavier Garneau

Dept. des sciences fondamentales

Universite du Quebec a Chicoutimi

555 blvd. de l'Universite

Chicoutimi, Quebec G7H 2B1

Contact: Dr. Francois-Xavier Garneau

Telephone: (418) 545-5011 ext. 5071

Fax: (418) 545-5012

Laboratories (Soil Analysis)

Norwest Labs

19575 - 55A Avenue #104

Surrey, B.C. V3S 8P8

Telephone: (604) 514-3322

Fax: (604) 514-3323

Dr. A. Robin Robinson

Laboratory Director
 Protein Biochemistry Research Laboratory
 Nova Scotia Agricultural College
 21 Pictou Road
 Truro, Nova Scotia B2N 5E3
 Contact: Dr. A.R. Robinson
 Telephone: (902) 893-6624 Fax: (902) 893-1404
 Contact: Dr. G.W. Stratton
 Telephone: (902) 893-6609 Fax: (902) 893-1404

Hemp Food Association

P.O. Box 1368
 Santa Rosa CA 95402-1368 USA
 Telephone: 707-571-1330 Fax 707-545-7116

International Hemp Association

Postbus 75007, Amsterdam, Holland, 1070AA
 Phone/Fax: 3120-618-8758

North American Industrial Hemp Council

P.O. Box 259329, Madison, WI 53725
 Phone: 608-224-5135 Fax: 608-224-5111

Canadian Industrial Hemp Council

c/o Sarah Francis
 Phone: 902-477-6686 Fax: 902-477-1017

Organized Associations

B.C. Industrial Hemp Growers Assn.

c/o Lee Wells
 RR 1, S200, Grand Forks BC V0H 1H0
 Telephone 250-442-0333

Canadian Hemp Growers Association

Michael Hansen/Brianne Whitworth
 5811-156th St.,
 Surrey BC V3S 8E7
 Telephone: 604-506-2352 Fax: 604-574-5258

IND-HMP Internet Discussion Group

The BC Ministry of Agriculture and Food invites your participation in IND-HMP – a discussion group for people involved in the production, processing and use of industrial hemp. We look forward to an exchange of information on primary, value-added production and research.

- To *sign on* to IND-HMP, address an Internet email message to:
mailev@cariboo.bc.ca
 In the body of the message, type a one-line command:
Subscribe IND-HMP Firstname Lastname (your first and last name)
 The computer will then send you some information on the discussion group i.e. rules and use
- To *communicate* with the group with questions, answers or comments, address your messages to:
IND-HMP@cariboo.bc.ca
 This will send a message to the whole group, or, if you want to send a personal message or question you will have to use their personal e-mail address. These can be found by asking the computer for a list – see #3 below.
- To get *list of subscribers* address message to:
mailev@cariboo.bc.ca
 In body of message type: **Send/List IND-HMP**
- To *unsubscribe* address message to:
mailev@cariboo.bc.ca
 In body of message type:
unsubscribe IND-HMP

For further information contact:

Al Oliver, BScA, P.Ag.
 Special Crops Horticulturist
 BC Ministry of Agriculture and Food
 162 Oriole Road Kamloops BC V2C 4N7
 Telephone: 250-371-6050
 Fax: 250-828-4631
 Email: Al.Oliver@gems3.gov.bc.ca



INFORMATION

March 1998

COMMERCIAL PRODUCTION OF INDUSTRIAL HEMP

Effective March 12, 1998, the commercial production (including cultivation) of industrial hemp is now permitted in Canada, under licences and authorizations, issued by Health Canada.

Industrial Hemp usually refers to varieties of the *Cannabis* plant that have a low content of THC (delta-9 tetrahydrocannabinol) and that are generally cultivated for fibre. Industrial hemp should not be confused with varieties of *Cannabis* with a high content of THC which are referred to as marijuana. The psychoactive ingredient in marijuana is THC.

Internationally, *Cannabis* is regulated by the United Nation's *Single Convention on Narcotic Drugs*. Canada has signed and ratified this Convention. The *Controlled Drug and Substance Act (CDSA)* came into force effective May 14, 1997. The *Industrial Hemp Regulations* to the CDSA will permit the commercial cultivation of industrial hemp in Canada.

The Regulations control the activities relating to importation, exportation, possession, production, sale, provision, transport, sending, delivering and offering for sale of industrial hemp.

The Regulations define industrial hemp as the plants and plant parts of the *Cannabis* plant, whose leaves and flowering heads do not contain more than 0.3 percent THC. It includes derivatives of the seeds such as oil and seedcake. It does not include non-viable *Cannabis* seed, but it includes its derivatives.

It also does not include the mature stalks or the fibres derived from those stalks. This means that such fibres or the products made from the mature cannabis stalk may be imported, treated and sold in Canada.

The Regulations consist of the following components:

- Importers and exporters of industrial hemp, in the form of seed or viable grain, will be licensed. In addition to holding a licence they will also be required to obtain a permit for each shipment.
- The importer must ensure that shipments of viable grain are accompanied by foreign certification. A list will be published by Health Canada indicating which countries are designated as having equivalent controls on the production of viable grain. Viable grain may only be imported from listed countries. This will ensure that viable grain imported will not produce a plant containing more than 0.3% THC.

- Seed growers will be restricted to a 0.4 hectare minimum plot size and will be required to demonstrate current membership in the Canadian Seed Growers Association as part of their licence application. Seed growers will be required to provide the number of hectares grown in the previous two years as part of their licence application.
- Plant breeders will not be restricted to minimum plot sizes. Persons applying for a licence as a plant breeder must be registered with the Canadian Seed Growers Association and may only cultivate industrial hemp under this regulatory framework. The pedigreed seed restriction which applies to growers in the year 2000 does not apply to plant breeders nor does the limitation to the *List of Approved Cultivars*.
- Growers for fibre or viable grain will require a licence before they can purchase seeds from a distributor or cultivate industrial hemp. Growers will be required to provide the number of hectares grown in the previous two years as part of their licence application.
- Only approved varieties of industrial hemp seeds, as listed on Health Canada's *List of Approved Cultivars* may be planted. Commencing January 1, 2000, only pedigreed seeds of approved varieties may be planted. Growers will be required to identify their fields, and maintain records of production and distribution.
- Licences and audit trails will also be required for processing activities such as pressing seeds into oil. All parties licensed or authorized will be required to identify a person resident in Canada who will be responsible for the licensed activities.
- To obtain a licence for the importation, exportation, production or sale of industrial hemp, applicants will be required to produce a police security check.
- Derivatives of seed or viable grain, such as oil and seed cake, will be exempted from the Regulations if there is evidence that the derivatives contain no more than 10 micrograms of delta-9-tetrahydrocannabinol per gram and carry appropriate labelling statements. Products made from derivatives of seed or viable grain will be exempted if there is evidence that each lot or batch contains no more than 10 micrograms of delta-9-tetrahydrocannabinol per gram.
- Importers and exporters of derivatives will be required to provide proof with each shipment that the shipment contains no more than 10 micrograms of delta-9-tetrahydrocannabinol per gram for each lot to ensure that the product is within the limit. Similarly products made from the derivatives of seed or viable grain must be accompanied with evidence that each shipment contains no more than 10 micrograms of delta-9-tetrahydrocannabinol per gram.
- No person will be permitted to import or export a derivative or a product produced from a derivative that contains more than 10 micrograms of delta-9-tetrahydrocannabinol per gram.

No person will be permitted to import or sell whole plants, including sprouts or the leaves, flowers or bracts of industrial hemp; or import, sell, or produce any derivative or any product made from a derivative of the above.

- Authorizations will be required for transportation, when products are transported outside the direction or control of a licence holder, or for possession for the purpose of testing for viability.
- No person shall advertise to imply that a derivative or product is psychoactive.
- Testing for the level of THC in leaves or in derivatives must be done by a competent laboratory according to standards defined by Health Canada.

Health Canada will continue to issue licenses for approved research studies related to the cultivation of hemp for industrial purposes.

Application Forms and relevant Guidance Documents, aimed at expediting the review of licences and authorizations for the commercial cultivation of industrial hemp and also for research licences, are available.

The documents are available from:

Internet: www.hc-sc.gc.ca/hpb-dgps/therapeut
Section: Hemp

or
Niels Hansen-Trip, Manager, Hemp Project
Bureau of Drug Surveillance
Therapeutic Products Directorate
Address Locator 4103A, 122 Bank Street, 3rd Floor
Ottawa, Ontario, Canada, K1A 1B9
Phone: (613) 954-7790 FAX: (613) 952-7738
(General Information: Benjamin — 613-954-6524)

Western Region

Rod Neske (Inspector-British Columbia/Yukon)
Bureau of Drug Surveillance
3155 Willingdon Green
Burnaby, British Columbia, V5G 4P2
Phone: (604) 666-2793 FAX: (604) 666-3149

Copies of the *Controlled Drugs and Substances Act* are available from:

Internet: canada.justice.gc.ca/FTP/EN/Laws/

or
Canada Communications Group
Ottawa, Ontario
K1A 0S9
Telephone - (613) 956-4802



CANADIAN FOOD INSPECTION AGENCY
ANIMAL AND PLANT HEALTH DIRECTORATE
PLANT PROTECTION DIVISION
59 Camelot Drive
Nepean, Ontario
K1A 0Y9 (Tel: 613-225-2342; FAX: 613-228-6602)

AGENCE CANADIENNE D'INSPECTION DES ALIMENTS
DIRECTION DE L'HYGIÈNE VÉTÉRINAIRE ET
DE LA PROTECTION DES VÉGÉTAUX
DIVISION DE LA PROTECTION DES VÉGÉTAUX
59, promenade Camelot
Nepean (Ontario)
K1A 0Y9 (Tel: 613-225-2342; FACS: 613-228-6602)

D-96-03

**(EFFECTIVE DATE)
January 27, 1998
(3rd REVISION)**

Title/Titre

PLANT PROTECTION IMPORT REQUIREMENTS FOR HEMP, CANNABIS SATIVA

Our File/Notre référence

3525-1-1

3525-1-1-0

I SUBJECT

This directive states the import requirements for hemp (*Cannabis sativa*) plants and seed. It takes effect immediately.

It **supersedes** the D-96-03 (2nd Revision, dated August 8, 1997; all reference to **hemp** in the following two documents: D-94-14, dated 18/01/95 and D-87-20, dated 28/07/87, and any other previous documents referring to **hemp**.

I BACKGROUND

The third revision modifies section V., Commodities Exempt.

The original Pest Risk Assessment (PRA) and additional information supplied subsequently indicate that, at this time, there is inconclusive evidence to substantiate or negate the existence of major pests of quarantine significance for hemp.

However, a number of bacteria and fungi have been identified as associated with hemp, which may have the potential to be quarantine pests. Therefore, in a prudent manner we will require some mitigating measures. A requirement to have all seed cleaned (free of soil peds, plant debris and related matter) will be a minimum requirement to reduce the probability of introducing these and possibly other potential quarantine pests. To reflect the above review, the movement requirements in section VIII have been changed.

Section VIII – Movement Requirements are further clarified to importers. Importers of hemp plants and seed from all countries including the continental U.S., must obtain a licence to grow hemp and permit to import from Health Canada. Health Canada requirements must be met before Permits to Import can be issued by the Canadian Food Inspection Agency (CFIA).

Hemp production was prohibited in Canada in 1938 under the Opium and Narcotic Drug Act, but the prohibition was relaxed briefly during World War II when traditional sources of fibres were unavailable. The prohibition was renewed after the war until 1961. Between 1961 and 1994, Health Canada allowed limited production in Canada for research purposes only. The situation in the United States (U.S.) has closely paralleled that in Canada.

The psychoactive compound that makes hemp a controlled substance is delta-9 tetrahydrocannabinol (THC). Some varieties of hemp have over thirty times more THC than others. Hemp varieties with low levels (<0.3%) of THC may be used to produce high quality fibre for paper, cloth and rope.

Health Canada recognizes the difference between these two types of hemp and regulates who can produce a crop for fibre. The production of hemp for consumption i.e. smoking, is still illegal. Production for fibre was authorized to one approved Ontario grower in 1993.

Hemp growing is expected to develop into a significant new fibre industry in Canada. Since 1994, Health Canada has granted more licences to grow hemp for fibre in Ontario, Manitoba, Saskatchewan and Alberta.

CFIA regulates hemp because of the risk of introducing potential quarantine pests to Canadian agriculture.

III. LEGISLATIVE AUTHORITY

Plant Protection Act, s.c. 1990, c.22

Plant Protection Regulations, SOR/95-212

Plant Protection Fees Regulations, SOR/95-218

IV. REGULATED COMMODITIES

Plants and seed of hemp, *Cannabis sativa* for propagation.

V. COMMODITIES EXEMPT

The following products from all sources, are exempt from plant protection documentary requirements:

- processed and semi-processed hemp fibre and fibre products, e.g. cordage, crude fibre, textiles containing a percentage of hemp;
- seeds imported for uses other than planting (e.g. bird feed, processing or human consumption, etc.). They must be free of soil, plant debris and related matter. The intended use must be clearly evident to an inspector (e.g. stated on the shipping documents, destination is a processing plant etc.)
- raw hemp material for industrial processing.

Note: Although exempt from plant protection requirements, the above commodities may be subject to other regulatory requirements (see section XI.).

VI. REGULATED PESTS

Based on PRA information, the following pests are not known to be present in Canada but are associated with hemp and may be of potential economic important.

Pests Associated with Hemp

Pseudomonas syringae pv. *cannabina* (bacteriosis of hemp)

Xanthomonas campestris pv. *cannabis* (leaf spot of hemp)

Fusarium oxysporum f.sp. *cannabis*

Pseudoperonospora cannabina (downy mildew of hemp)

Orobancha spp. (broomrape)

The above list is compiled from available documentation and data bases. If other pests are intercepted on imported hemp, they may be examined for their potential to cause damage to crops and appropriate phytosanitary measures may be required.

VII. REGULATED AREAS

All countries

VIII. MOVEMENT REQUIREMENTS

1. PLANTS

1.1 From the continental U.S.

Importers will need to obtain a licence to grow hemp and Permit to Import from Health Canada.

A Permit to Import is not required from the Plant Protection Division of CFIA. However, a Phytosanitary Certificate is required.

In the case of plants associated with soil (ie. Rooted, grown and/or growing in soil), the Phytosanitary Certificate must contain appropriate additional declarations for soil pests within regulated areas of the U.S.

Plants not associated with soil require a Phytosanitary Certificate, however, no additional declarations are required.

1.2 From other origins

A Permit to Import is required. This will be issued only after a licence to grow hemp and Permit to Import has been issued by Health Canada.

Plants imported with soil are prohibited.

Plants originally associated with soil (ie rooted or grown in soil) must be imported bare-rooted, in an approved packing material, and be accompanied by a Phytosanitary Certificate with appropriate additional declarations for regulated soil pests.

In the case of plants not associated with soil, but rooted and imported in a medium approved under the Canadian Growing Media Program (CGMP), a Phytosanitary Certificate with an additional declaration as stipulated by the CGMP, is required.

NOTE: Shipments may be subject to other regulatory requirements as indicated in Section XI.

2 Seed

2.1 From the continental U.S.

A Permit to Import is not required from the Plant Protection Division of CFIA. However, importers will need to obtain a licence to grow hemp and Permit to Import from Health Canada.

All seed must be cleaned (free of soil peds, plant debris, and related matter) and accompanied by a Phytosanitary Certificate. No additional declarations are required.

2.2 From other origins

A Permit to Import is required and will be issued only after a licence to grow hemp and Permit to Import has been issued by Health Canada.

All seed must be cleaned (free of soil peds, plant debris and related matter) and accompanied by a Phytosanitary Certificate. No additional declarations are required.

NOTE: Shipments may be subject to other regulatory requirements as indicated in Section XI.

IX. INSPECTION PROCEDURES

1 DOCUMENT VERIFICATION

Permits to Import and Phytosanitary Certificates required for importations of hemp must be verified as valid prior to release of the material to the importer.

2 PRODUCT EXAMINATION

All shipments of imported hemp are subject to inspection by an authorized CFIA inspector at the first point of entry or at a place in Canada determined by the inspector. Samples may be taken to ascertain the absence of quarantine pests.

3 PHYTOSANITARY MEASURES

If the inspection of a shipment results in the detection of a quarantine pest or there are reasonable grounds to believe such a pest is present, the infested shipment may be refused entry, returned to origin, treated (ie. fumigated) or destroyed, at the importer's expense, as determined by the inspector.

X. NON-COMPLIANCE

An inability to provide a valid Permit to Import and/or Phytosanitary Certificate for the shipment on arrival, may result in delay in releasing the shipment, return to origin, treatment (ie. fumigation) or destruction of the shipment at the importer's expense.

XI. OTHER REQUIREMENTS

The importation and production of all hemp products, including plants and seed for propagation, are regulated under the *Controlled Drugs and Substances Act and Regulations* as administered by the Health Protection Branch of Health Canada.

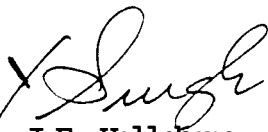
The importation of hemp seed for propagation is also regulated under the *Seeds Act and Regulations* as administered by CFIA.

Hemp seed for pet and wild bird feed is regulated under the *Health of Animals Act and Regulations* as administered by CFIA.

Any importer wishing to know about the requirements under the above Acts and Regulations should contact the local offices of Health Canada and CFIA.

XII. Fees

As of May 1, 1995 CFIA charges fees for Permits to Import, verification of import documents and product inspection in accordance with the *Plant Protection Fees Regulations*. Importers requiring more information on fees may contact any local office of CFIA.

for 

Dr. J.E. Holleb
Director
Plant Protection Division