

## HISTORY

Humans have cultivated hemp for over 10,000 years as an important source of food and fibre. Historical references to hemp date back to ancient China and Mesopotamia. Hemp seed and flower tops were known to provide medical comfort to people suffering a variety of ailments from 2700 BC through Roman times.

Hemp has been commercially produced around the world since the 1800s. Renowned for its strong natural fibres, it was originally used to make rope, cloth, sails, paper, and more. Hemp production decreased in the 1900s, however, when cotton and petroleum became more popular. Later, because of its close relation to marijuana, hemp was illegal to grow in Canada until the 1980s, although most other countries continued to allow it. The crop was legalized in Canada in 1998. Initially, the Canadian hemp market focused on meeting demand for fibre. Since 2009, the focus has shifted to meet rising consumer demand for hemp seed to make nutritious foods and food products.

The United States remains the largest single food market for Canadian industrial hemp production, but processed products are being shipped to over 30 different countries worldwide. Today, the world market for hemp production is dominated by China. Other top producing countries include France, Germany, United Kingdom, Chile, and Korea.

Some of Manitoba's top hemp product importers include the United States, South Korea, United Kingdom, Slovakia, and Japan.

## PRODUCTION

Manitoba is Canada's third largest hemp producer. Hemp thrives here because it adapts well to many different soils and climates. You're most likely to find it growing in south central and northwestern Manitoba, close to processing plants. Hemp

is a great option for farmers in areas where other high-value crops like edible beans or sunflowers wouldn't produce as well.

Hemp is an annual broadleaf plant with a taproot. The taproot may penetrate as deep as 15 to 30 cm, which helps the plant find water in dry years or sandy soils. Hemp generally takes 110 days to grow to maturity and needs around 25 to 30 cm of rainfall throughout the growing season.

Hemp plants can be either *monoecious* or *dioecious*.

- **Monoecious plants** have both male and female flowers. The male flowers are close to the bottom and the female flowers are close to the top.
- **Dioecious plants** are either all male, or all female, and wind carries pollen from the male to the female plant. Female hemp plants are shorter with more branches and loose flower clusters. Male plants are taller with curved heads.

Dioecious hemp plants are more common than monoecious hemp plants.

Most of the industrial hemp varieties grown here in Manitoba originated in Eastern Europe. Many of these varieties differ a great deal in height, maturity, seed size, oil content, oil composition and fibre content. These qualities determine the best end-use for the crop. In Manitoba, hemp growers must use pedigreed seed approved by Health Canada.

Hemp can be successfully grown under any conventional production system. Hemp fits in with typical crop rotation systems and can be produced and harvested with the same equipment used by grain producers. It can also be *zero-tilled* – sown into the previous year's crop stubble. It thrives in organic production systems as well.



## DID YOU KNOW?

In the early 1900s, **Henry Ford** revolutionized the automobile industry by introducing the Model T car. Ford also envisioned a **car manufactured and fueled by hemp**. In the 1930s, he even produced a prototype of the vehicle.

Hemp is usually planted mid-May to early June when the soil is warm. Hemp planted under ideal conditions will germinate very quickly and can reach 25 to 30 cm in height just two to four weeks after planting.

Depending on factors such as variety, seeding date and summer temperatures, hemp matures in 90 to 120 days. Hemp is harvested when approximately 70 to 80 per cent of the seeds are ripe and the grain contains 10 to 20 per cent moisture.

Hemp's tall plants and thin stems make it especially challenging to harvest, but ultimately no match for the ingenuity of Manitoba farmers. Most producers have made innovative modifications to their combines and other machines to help the unusually large amounts of plant matter pass through their machinery smoothly.

Sometimes, hemp is *swathed* (cut and left to dry in a row) with a machine called a *swather*, before harvesting the seed with a machine called a *combine*. In Canada, however, it is more common for farmers to attach a special hemp-cutting header to their combine so that they can cut and harvest at the same time. A combine is a piece of equipment that separates the pods from the plant and then shoots the remaining stems and leaves out into a row on the field where it can be picked up and baled.

For hemp grown for seed or grain, the leftover straw is usually burned as it stands in the field, or baled and burned, because the fibres are too tough to be worked back into the soil. For hemp grown for seed and fibre, the leftover straw is baled and sold to fibre producers. For hemp grown only for fibre, the plants are cut down in early August before seed set, raked two to three weeks later, and then baled two to three weeks after that, when their moisture content reaches 12 to 15 per cent. This

process provides a better quality *bast fibre* more suitable for use in the textile industry.

Because hemp is sold and consumed as raw food, sanitation is very important. Harvesting equipment, trucks and storage bins are kept thoroughly clean. Because moist seeds can spoil, hemp is dried down with heated air grain dryers to below 10 per cent moisture content immediately after harvest. Hemp seed is also cleaned to remove contaminants such as weed seeds, bacteria, mold, plant parts, insects and cracked seeds resulting from combining.

## HEMP IS NOT MARIJUANA

Hemp and marijuana both originate from plants in the genus *Cannabis*, but industrial hemp contains, at most, 0.3 per cent tetrahydrocannabinol (THC) in its leaves and heads. Because of THC's *psychoactive properties*, farmers require an industrial license from Health Canada in order to produce the crop from certified seed. These licenses are issued for periods of up to five years. Licensed growers must report when and where they are growing hemp each year.

Licensed farmers are authorized to cultivate, sell, import, export, clean, prepare, and process hemp. They can also research how soil, plots, and crop rotation impact growing hemp. Other forms of research require a separate license. Processors of hempseed and *cannabidiol* (CBD), another psychoactive component of the cannabis plant, also require a license. Processors working with only hemp fibre do not.

Licensed producers can legally harvest, store, and sell cannabis flowers, buds and leaves that might contain CBD since October 2018.

## PROCESSING

Hemp is a versatile plant with many uses. Manitoba processors primarily crush hemp grain for oil, dehull the grain for the hemp heart, or mill it for products such as protein powder, flour, and milk. Hemp seed oil is also used in cosmetics, ink, paint, and fuel.

The stalk of the hemp plant is a high-yielding and renewable source of fibre. Hemp fibre can be used to make fabric, rope, twine, paper, animal bedding, biodegradable plastics, insulation, animal bedding, cat litter, soil enricher, garden bedding, and more. A growing number of hemp farmers now dedicate acres of farmland to hemp fibre production.

*Hemp seed* is another related commodity driving the industry. Technically a nut, these seeds are 30 to 35 per cent oil (by weight) and contain little to no psychoactive components.

Hemp seed and hemp seed oil are important ingredients in a wide range of products, including:

- Hemp seed nut butter (similar to peanut butter)
- Cold pressed hemp seed oil
- Hemp seed flour
- Hemp seed protein powder

Hemp is also being developed as a superior alternative to graphene, a supercapacitor energy storage technology used to power electronic devices.

*Parkland Industrial Hemp Growers Coop Ltd.* (PIHG) is a group of hemp growers located in Dauphin. Together, they're working on a plant breeding program to develop hemp varieties with higher grain and/or fibre yields, bigger seed size, and low THC levels. PIHG also helps members connect with processors and market their grains.

Manitoba is home to several major hemp processing companies. Some Manitoba hemp is sent to Alberta, Ontario, or Quebec to be processed.

## NUTRITION

Hemp grain is full of nutrients. Three tablespoons (30 grams) of de-hulled hemp seed contains 10 grams of protein, 8 grams of Omega 6, 3 grams of Omega 3, and only 180 calories. In fact, hemp's fatty acid and amino acid profiles are identically aligned with human DNA, so as a food source, it offers protein, omegas, and dietary fibre in perfect proportion to our nutritional needs.

The same three tablespoons also provide your body with essential vitamins and minerals, including calcium, iron, thiamine, riboflavin, vitamin B6, folate, phosphorous, magnesium, zinc, and manganese. It's almost like eating a vitamin tablet!

One variety of hemp grown in Manitoba, Canada, has been bred to contain an especially high content of GLA (gamma-Linolenic acid) in the seed, which is an Omega 6 only found in three or four plants worldwide, including evening primrose and borage.

Hemp seed is slightly nutty in taste, like a sunflower seed. It can be used in baking, smoothies, soups, stews, and salads, or it can be eaten on its own. Eating hemp seed with the hull gives you all the nutritional benefits listed above, plus a healthy dose of fibre!

## ENVIRONMENT

Hemp is a relative newcomer to Manitoba fields and has many differences from most of our other mainstream production crops. Nevertheless, it already appears to make a great addition to regular crop rotations. It helps break up common disease

cycles and provides farmers with an additional revenue stream thanks to its market value compared to other crops.

Industrial hemp is a robust, competitive plant that outcompetes weeds. In most cases, this makes production possible without the use of herbicides and reduces pesticide load on the environment.

Industrial hemp has a large tap root capable of penetrating deep into the soil to pick up water and nutrients for plant development. As a result, hemp recovers nutrients that might otherwise leach below the root zone and enter the groundwater. In addition, the deep roots open the soil and enhance the tilth (condition of tilled soil) for future crops. And because of the high biomass of hemp crops, it can sequester high amounts of carbon from the atmosphere through photosynthesis, storing it in the body and roots.

Hemp offers many different uses that can promote a more sustainable world. Hemp products can be recycled, reused and are 100 per cent biodegradable. Most hemp-derived products are non-toxic, biodegradable, and renewable.

### INDUSTRY IN MANITOBA

**Production:** 5,041 seeded hectares (2020)

**Number of Producers:** 118 (2020)

**Value to Economy:** \$96 million in exports (2020)

### INDUSTRY IN CANADA

**Production:** 22,242 seeded hectares (2020)

**Number of Producers:** 1,269 (2020)

## FARMER PROFILE



**ALLISON FISHER** Dauphin, Manitoba

“We like growing hemp on our farm because it adds diversity to our crop rotation while supporting multiple Manitoba processors. Hemp grain is a delicious and nutritious functional food. The remainder of the plant also has great potential as a renewable fibre product and CBD supplement.”

## CAREERS

- » Producer
- » Processing plant worker
- » Researcher
- » Farm advisor
- » Machinery manufacturing
- » Health Canada representative
- » Parts sales

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