



# Hemp as an Agricultural Commodity

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## Summary

In February 2007, legislation was introduced that would open the way for commercial cultivation of industrial hemp in the United States (H.R. 1009; in the 109<sup>th</sup> Congress, H.R. 3037). The Industrial Hemp Farming Act of 2007 would amend Section 102 of the Controlled Substances Act (21 U.S.C. 802(16)) to specify that the term “marijuana” does not include industrial hemp. Such a change would mean that state law would determine whether producers could grow and process industrial hemp within state borders, under state regulations. Currently, the Drug Enforcement Administration (DEA) determines whether any industrial hemp production authorized under a state statute will be permitted, and it enforces standards governing the security conditions under which the crop must be grown.

The terms “hemp” and “industrial hemp” refer to varieties of *Cannabis sativa* characterized by low levels of the primary psychoactive chemical (tetrahydrocannabinol, or THC) in their leaves and flowers. Although total industrial hemp acreage worldwide is small, farmers in more than 30 countries grow the crop commercially for fiber, seed, and oil for use in a variety of industrial and consumer products, including food.

Because of the psychoactive properties of some varieties of *Cannabis* (which can grow virtually anywhere in the United States), the federal government first began to control production in the late 1930s under the Marihuana Tax Act (50 Stat. 551). In 1970, production of all varieties of *Cannabis*, regardless of THC content and intended use, became tightly regulated under the Controlled Substances Act (21 U.S.C. §§802 *et seq.*). As a result, all hemp or hemp-containing products sold in the United States must now be imported or manufactured from imported hemp.

In the early 1990s a sustained resurgence of interest in allowing commercial cultivation of industrial hemp began in the United States. Farmers in regions of the country that are highly dependent upon a single crop, such as tobacco or wheat, have shown interest in its potential as a high-value alternative crop, although the economic studies conducted so far paint a mixed profitability picture. Over the past decade, more than 25 states have passed laws calling for economic or production studies.

The DEA has been unwilling to grant licenses for growing small plots of hemp for research purposes (as authorized by some state laws), and beginning in 1999 it made an effort, which it ultimately abandoned in 2004 following an unfavorable court decision, to ban imports of hemp food products that could contain trace amounts of THC. DEA officials express the concern that commercial cultivation would increase the likelihood of covert production of high-THC marijuana, significantly complicate DEA’s surveillance and enforcement activities, and send the wrong message to the American public concerning the government’s position on drugs.

This report will be updated if events warrant.

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## Introduction

For centuries, the plant species *Cannabis sativa* has been a source of fiber and oilseed used worldwide to produce a variety of industrial and consumer products. Currently, more than 30 nations grow industrial hemp as an agricultural commodity.<sup>1</sup> About 14 of those sell part of their production on the world market.

The terms “hemp” and “industrial hemp” refer specifically to varieties of *Cannabis sativa* characterized by low levels of tetrahydrocannabinol (THC, marijuana’s primary psychoactive chemical) in their leaves and flowers.<sup>2</sup> Like flax, the plant can produce both fiber and seed, although varieties better suited for one use or the other, as well as dual purpose varieties, have been developed. Cultivation practices also differ depending upon the variety planted.

Hemp fiber is amenable to use in a wide range of products including carpeting, home furnishings, construction materials, auto parts, textiles, and paper. Hemp seed, an oilseed, likewise has many uses, including industrial oils, cosmetics, pharmaceuticals, and food.<sup>3</sup>

The crop was widely grown in the United States from the colonial period into the mid-1800s; both fine and coarse fabrics, twine, and paper from hemp were in common use. However, by the 1890s, labor-saving machinery for harvesting cotton made the latter more competitive as a source of fabric for clothing, and the demand for coarse natural fibers was met increasingly by imports. Between 1914 and 1933, in an effort to stem the use of *Cannabis* flowers and leaves for their psychotropic effects, 33 states passed laws restricting legal production to medicinal and industrial purposes only.<sup>4</sup>

## Legal Status of *Cannabis*, 1937 to the Present

In 1937, Congress passed the first federal law to discourage *Cannabis* production for marijuana while still permitting industrial uses of the crop (the Marihuana Tax Act; 50 Stat. 551). Under this statute, the government actively encouraged farmers to grow hemp for fiber and oil during World War II. After the war, competition from synthetic fibers, the Marihuana Tax Act, and increasing

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<sup>1</sup> In this report, “hemp” refers to industrial hemp, “marijuana” (or “marihuana” as it is spelled in the older statutes) refers to the psychotropic drug (whether used for medicinal or recreational purposes), and “*Cannabis*” refers to the plant species that has industrial, medicinal, and recreational varieties. This report does not cover issues pertaining to medical marijuana. For information on that subject, see CRS Report RS20998, *Marijuana for Medical Purposes: A Glimpse of the Supreme Court’s Decision in United States v. Oakland Cannabis Buyers’ Cooperative and Related Legal Issues*.

<sup>2</sup> The European Union (EU) and the Organization for Economic Cooperation and Development (OECD, which includes Canada) use 0.3% THC as the dividing line between industrial and potentially drug-producing *C. sativa*: cultivars having less than 0.3% THC legally can be cultivated under license, cultivars having more than that amount are considered to have too high a drug potential. A THC concentration of 1% is considered sufficient to have a psychotropic effect. Source: Ernest Small and David Marcus, “Hemp: A New Crop with New Uses for North America,” in J. Janick and A. Whipkey, eds., *Trends in New Crops and New Uses* (Alexandria, VA: Amer. Soc. of Hort. Sci. Press, 2002). Available online at <http://www.hort.purdue.edu/newcrop/ncnu02/v5-284.html>.

<sup>3</sup> The term “hempnut” is used frequently to refer to shelled hemp seed used for food. The Industrial Hemp Information Network (Hemptech™) offers an online list of available hemp fiber, seed, and oil products, and their suppliers at <http://www.hemptech.com>.

<sup>4</sup> Richard J. Bonnie and Charles H. Whitebread, *The Marihuana Conviction: A History of Marihuana Prohibition in the United States* (Charlottesville: University Press of Virginia, 1974), p. 51.

public anti-drug sentiment resulted in fewer and fewer acres of hemp being planted, and none at all after 1958.

The past decade has witnessed a resurgence of interest in the United States in producing industrial hemp. Farmers in regions of the country that are highly dependent upon a single crop, such as tobacco or wheat, have shown interest in hemp's potential as a high-value alternative crop, although the economic studies conducted so far paint a mixed profitability picture.

Beginning around 1995, an increasing number of state legislatures began to consider a variety of initiatives related to industrial hemp. Most of these are resolutions calling for scientific, economic, or environmental studies, and some are laws authorizing the planting of experimental plots under state statutes. Nonetheless, the actual planting of *Cannabis*, even for state-authorized experimental purposes, is regulated by the federal Drug Enforcement Administration (DEA) under the authority of the Controlled Substances Act of 1970 (Title II of P.L. 91-513 (21 U.S.C. §§802 *et seq.*)).

Congress adopted in the Controlled Substances Act (CSA) the same definition of *Cannabis sativa* that appeared in the 1937 Marihuana Tax Act. The CSA definition reads:

The term marijuana means all parts of the plant *Cannabis sativa* L., whether growing or not; the seeds thereof; the resin extracted from any part of such plant; and every compound, manufacture, salt, derivative, mixture, or preparation of such plant, its seeds or resin. Such term does not include the mature stalks of such plant, fiber produced from such stalks, oil or cake made from the seeds of such plant, any other compound ... or preparation of such mature stalks (except the resin extracted therefrom), fiber, oil, or cake, or the sterilized seed of such plant which is incapable of germination.

The statute thus retains control over all varieties of the *Cannabis* plant by virtue of including them under the term “marijuana” and making no distinctions between low- and high-THC varieties. The language exempts from control the parts of mature plants—stalks, fiber, oil, cake, etc.—intended for industrial uses.

Strictly speaking, the CSA does not make *Cannabis* illegal; rather, it places the strictest controls on its production, making it illegal to grow the crop without a DEA permit. DEA issued a permit for an experimental plot in Hawaii in the 1990s (now expired), but none since then. All hemp products sold in the United States are imported or manufactured from imported hemp materials.

Under a state law passed in 1999, North Dakota became the first state to authorize industrial hemp production within its borders. A North Dakota State University researcher twice applied for, but did not receive, a DEA permit. In January 2007, the North Dakota Department of Agriculture issued final regulations on licensing hemp production. One application for a permit from a state-licensed producer is pending with the DEA.<sup>5</sup>

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<sup>5</sup> Information on North Dakota's requirements for licensing hemp production is available at <http://www.agdepartment.com/Programs/Plant/HempFarming.htm>.

## Recent Legislative Activity

In February 2007, Representative Ron Paul introduced the Industrial Hemp Farming Act in the 110<sup>th</sup> Congress (first introduced in the 109<sup>th</sup> Congress in June 2005 as H.R. 3037). This is the first legislative proposal at the federal level intended to facilitate the possible commercial cultivation of industrial hemp in the United States. The bill would amend the Controlled Substances Act (21 U.S.C. 802(16)) to add language stating that the term “marijuana” does not include industrial hemp. The measure was referred to the House Committee on Energy and Commerce and to the House Committee on the Judiciary.

If enacted, the bill would permit industrial hemp production based on state law, without preemption by the federal government under the Controlled Substances Act. The measure would grant exclusive authority to any state permitting industrial hemp production and processing to determine whether any such *Cannabis sativa* plants met the limit on THC concentration as set forth in the Controlled Substances Act. In any criminal or civil action or administrative proceeding, the state’s determination would be conclusive and binding.<sup>6</sup>

## Foreign Hemp Production and U.S. Consumption

Approximately 30 countries in Europe, Asia, and North and South America currently permit farmers to grow hemp, although most banned production for certain periods of time in the past. Recent, reliable, aggregated data on the number of acres worldwide devoted to industrial hemp production are not available.

The United States is the only developed nation in which the production of industrial hemp is not permitted. Great Britain lifted its ban in 1993 and Germany followed suit in 1996. The European Union subsidizes hemp fiber production under its Common Agricultural Policy.<sup>7</sup> Nonetheless, in the developed countries in which it is grown, industrial hemp is generally considered a minor crop.

In 1998, Canada authorized production for commercial purposes, following a three-year experimental period and a 50-year prohibition. As a condition of receiving a license to grow industrial hemp, Canadian farmers are required to register the GPS coordinates of their fields, use certified low-THC hemp seed, allow government testing of their crop for THC levels, and meet or beat a 10ppm standard for maximum allowable THC residue in hemp grain products.<sup>8</sup> Health Canada (the Canadian department that issues licenses for production) reported 24,000 acres planted in 2005, and 48,000 in 2006.<sup>9</sup>

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<sup>6</sup> Further questions on the legal aspects of H.R. 3037 should be directed to the CRS American Law Division.

<sup>7</sup> A search under the term “hemp” on the European Union Commission on Agriculture website [http://ec.europa.eu/agriculture/index\\_en.htm](http://ec.europa.eu/agriculture/index_en.htm) leads to information on the support program.

<sup>8</sup> Health Canada regulations for obtaining permits are viewable online at [http://www.hc-sc.gc.ca/dhp-mps/substancontrol/hemp-chanvre/index\\_e.html](http://www.hc-sc.gc.ca/dhp-mps/substancontrol/hemp-chanvre/index_e.html). Additional information is available on the Canadian Food Inspection Agency website at <http://www.inspection.gc.ca/english/plaveg/seeem/indust/hemchae.shtml>.

<sup>9</sup> Agriculture Canada, “Canada’s Industrial Hemp Industry,” March 2007, available online at [http://www.agr.gc.ca/misb/spcrops/sc-cs\\_e.php?page+hemp-chanvre](http://www.agr.gc.ca/misb/spcrops/sc-cs_e.php?page+hemp-chanvre).

The retail value of all hemp-based products imported and sold in the United States is difficult to estimate accurately because some imports may be represented in the USDA trade database under several different categories besides hemp seed, oil, yarn, fabric, etc.—for example, under building materials, carpets, or paper. The database shows that the value of U.S. imports under categories actually labeled “hemp” was \$6.3 million in 2006 and \$6.7 million in 2005.<sup>10</sup>

The leading exporters of raw and processed hemp fiber to the United States are China, Romania, Hungary, Italy, Canada, and India. The leading exporters of hemp oil and seed are the United Kingdom, Canada, Switzerland, and China. The USDA trade database shows that the value of Canada’s exports of hemp seed to the United States grew from \$0 in 2004 to \$1.2 million in 2006, after a long-standing legal dispute over U.S. imports of hemp foods ended in late 2004.<sup>11</sup>

## **Legal Dispute over Hemp Food Imports**

In late 1999, the DEA acted administratively to demand that the U.S. Customs Service enforce a zero-tolerance standard for the THC content of all forms of imported hemp, and hemp foods in particular.

The DEA followed up, in October 2001, with publication of an interpretive rule in the *Federal Register* (66 FR 51530) explaining the basis of its zero-tolerance standard. It held that when Congress wrote the statutory definition of marijuana in 1937, it “exempted certain portions of the *Cannabis* plant from the definition of marijuana based on the assumption (now refuted) that such portions of the plant contain none of the psychoactive component now known as THC.”<sup>12</sup> The DEA’s interpretation made hemp with any THC content subject to enforcement as a controlled substance.

Hemp industry trade groups, retailers, and a major Canadian exporter filed suit against the DEA, arguing that congressional intent was to exempt plant parts containing naturally occurring THC at non-psychoactive levels, the same way it exempts poppy seeds containing trace amounts of naturally occurring opiates (21 U.S.C. §802 (19)(20)). Industry groups maintain that (1) naturally occurring THC in the leaves and flowers of *Cannabis* varieties grown for fiber and food is already at below-psychoactive levels (compared with drug varieties); (2) the parts used for

food purposes (seeds and oil) contain even less; and (3) after processing, the THC content is at or close to zero. U.S. and Canadian hemp seed and food manufacturers have in place a voluntary program for certifying low, industry-determined standards in hemp-containing foods.<sup>13</sup>

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<sup>10</sup> USDA, Foreign Agricultural Service, “U.S. Trade Internet System: Imports.” Available at <http://www.fas.usda.gov/ustrade/>.

<sup>11</sup> *Ibid.*

<sup>12</sup> Both the proposed rule (which was published concurrently with the interpretive rule) and the final rule gave retailers of hemp foods a date after which the DEA could seize all such products remaining on shelves. On both rules, hemp trade associations requested and received court-ordered stays blocking enforcement of that provision. For more information on the legal history of hemp, contact the CRS American Law Division.

<sup>13</sup> Background information on the TestPledge Program is available at <http://www.TestPledge.com>. The intent of the program is to assure that consumption of hemp foods will not interfere with workplace drug testing programs or produce undesirable mental or physical health effects.



On February 6, 2004, the U.S. Court of Appeals for the 9<sup>th</sup> Circuit permanently enjoined the enforcement of the final rule (68 FR 14113, published March 21, 2003). The Court stated that “the DEA’s definition of ‘THC’ contravenes the unambiguously expressed intent of Congress in the CSA and cannot be upheld.”<sup>14</sup> The possibility that the government might appeal the ruling remained alive for several months, but in late September 2004 the Administration let the final deadline pass without filing.

## **Review and Analysis of Economic Studies**

Hemp proponents base their economic arguments for legalizing the crop on its potential value as a component in a wide array of industrial and consumer products, and thus its potential as a profitable alternative crop for farmers. They contend that a commercial hemp industry would generate its own profitable niche markets, even where conventional or alternative commodities already exist, and that basing estimates of future profitability on the current usage of imported hemp ignores the crop’s larger potential.

Some supporters of industrial hemp legalization also argue that it could have renewed value as a strategic crop for defense preparedness purposes, in line with its role in World War II. In 1994, President Clinton issued an Executive Order, EO 12919, entitled “National Defense Industrial Resources Preparedness,” which was intended to strengthen the U.S. industrial and technology base for meeting national defense requirements. The order included hemp under the category of “food resources,” which it defined to mean, in part, “all starches, sugars, vegetable and animal or marine fats and oils, cotton, tobacco, wool, mohair, hemp, flax, fiber and other materials, but not any such material after it loses its identity as an agricultural commodity or product.”<sup>15</sup> It could be argued that the government has already recognized that industrial hemp is capable of contributing to national defense needs and to the readiness of U.S. defenses during times of peace as well as national emergency.

Opponents of industrial hemp point out that U.S. agricultural history illustrates the great difficulty of bringing promising alternative crops into profitable commercial use. USDA has supported research on alternative crops and industrial uses of common commodities since the late 1930’s. Currently, under the Critical Agricultural Materials Act of 1984 (P.L. 98-284), the supplemental and alternative crops provisions of the 1985 and 1990 omnibus farm acts and other authorities, the federal government supports about \$15 million annually in research and development on alternative crops at USDA and state laboratories.<sup>16</sup> Some alternative crops that have become established in certain parts of the United States—kenaf (for fiber) in Texas, jojoba (for oil) in Arizona and California, and amaranth (for nutritious grain) in the Great Plains states, for example—have benefits similar to those ascribed to hemp, but are not complicated by having a drug variety within the same species.

One of the first economic analyses of industrial hemp’s potential as a profitable crop for U.S. farmers was a report prepared by USDA’s Economic Research Service in 2000. ERS based its

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<sup>14</sup> *Hemp Industries Association v. Drug Enforcement Administration*, 357 F.2d (9<sup>th</sup> Circuit 2004).

<sup>15</sup> For more information on this EO and on the laws that relate to the production, shipment, importation or regulation of hemp in the United States, call the CRS American Law Division.

<sup>16</sup> USDA/Agricultural Research Service Budget Office and USDA Explanatory Notes for FY2007.



domestic production assumptions on import data covering hemp fiber, yarn, and fabric, but excluding seed and oil. The report concluded that:

U.S. markets for hemp fiber ... and seed ... are, and will likely remain, small, thin markets. Uncertainty about long-run demand for hemp products and the potential for oversupply discounts the prospects for hemp as an economically viable alternative crop for American farmers.<sup>17</sup>

The more recent study by Small and Marcus (2002) reflects the fact that interest in the crop in the United States has deepened since ERS calculated its negative forecast. It concludes:

It often takes 10 to 15 years for the industry associated with a new agricultural crop to mature. While it is true that foreign imports have been the basis for hemp products in North America for at least a decade, North American production is only 4 years of age in Canada... Viewed from this perspective, the hemp industry in North America is still very much in its infancy ... and is likely to continue experiencing the risks inherent in a small niche market for some time. [However,] hemp ... has such a diversity of possible uses, is being promoted by extremely enthusiastic market developers, and attracts so much attention that it is likely to carve out a much larger share of the North American marketplace than its detractors are willing to concede.<sup>18</sup>

An update in 2007 of a December 2003 report from Agriculture Canada draws an even more positive conclusion, based on its reading of consumer interest:

Hemp's remarkable advantages are hard to beat: it thrives without herbicides, it reinvigorates the soil, it requires less water than cotton, it matures in three to four months, and it can yield four times as much paper per acre as trees. Hemp can be used to create building materials that are twice as strong as wood and concrete, textile fiber that is stronger than cotton, better oil and paint than petroleum, clean-burning diesel fuel, and biodegradable plastics. In addition, it can produce more digestible protein per acre than any other food source. These advantages are in tune with the environmental and health preferences of today's North American public. The growing curiosity of consumers, the interest shown by farmers and processors, and Canada's excellent growing conditions for industrial hemp allow optimistic views for its future.<sup>19</sup>

According to the Canadian Hemp Trade Alliance (CHTA), a leading trade group, the harvesting, shelling, and processing technologies for conventional oilseed crops in Canada are suitable for handling hemp grown for seed, which has enabled acreage to expand as soon as markets are found. Farmers who obtain organic certification for their hemp seed receive premium prices. CHTA reported a market price of 50 to 60 cents (C\$) per pound for conventional hemp seed, and an 85-cent/pound market price for certified organic seed in winter 2003-2004.

The Canadian hemp fiber industry is not as developed. Because the crop became legal to produce again in 1998, government and private funds have only recently begun to support research on breeding fiber varieties and tackling the problems associated with harvesting and processing.<sup>20</sup>

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<sup>17</sup> U.S. Department of Agriculture, Economic Research Service, *Industrial Hemp in the United States: Status and Market Potential*, ERS Report AGES001E, January 2000.

<sup>18</sup> Small and Marcus, p. 321.

<sup>19</sup> See footnote 9.

<sup>20</sup> One example of recently begun hemp fiber research is a collaborative effort of the National Research Council of Canada and Hemptown Clothing, Inc., to develop a new enzyme technology to produce a softer and whiter hemp (continued...)

Similarly, the infrastructure for efficiently transporting and handling the heavy, bulky product is lagging. CHTA states, “The current economic reality of hemp [fiber] is that it cannot compete with waste products (wood, straw, stover, etc.) on price.... Hemp is valued between 4-10 times that of waste fibers, so it must find its way to the right products and markets.”

Proponents of reintroducing hemp as a commodity crop in the United States are watching the Canadian experience with interest. However, it also is important to keep an eye on the larger picture. The world market for hemp products is relatively small, and China, as the world’s largest hemp fiber and seed producer, has had and likely will continue to have major influence on market prices and thus on the year-to-year profits of producers and processors in other countries.<sup>21</sup> Canada’s head start in the North American market for hemp seed and oil also would likely affect the profitability of a start-up industry in the United States.

Regardless, at least for the time being, government policy on the issue is reflected in the DEA’s arguments against commercial hemp production. These are that commercial cultivation would increase the likelihood of covert production of high-THC marijuana, significantly complicate DEA’s surveillance and enforcement activities, and send the wrong message to the American public concerning the government’s position on drugs. DEA officials and a variety of other observers also express the concern that efforts to legalize hemp—as well as those to legalize medical marijuana—are a front for individuals and organizations whose real aim is to see marijuana decriminalized.<sup>22</sup>

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fabric, among other things. Information from the Research Council is available online at [http://www.nrc-cnrc.gc.ca/highlights/2004/0407hemp\\_e.html](http://www.nrc-cnrc.gc.ca/highlights/2004/0407hemp_e.html).

<sup>21</sup> T. Randall Fortenbery and Michael Bennett, “Opportunities for Commercial Hemp Production,” *Review of Agricultural Economics*, vol. 26, no. 1 (spring 2004), pp. 97-117. The time period covered in this study ends with the year 2000.

<sup>22</sup> For more information on legislative and executive branch actions concerning illegal drugs, see CRS Report RL32352, *War on Drugs: Reauthorization and Oversight of the Office of National Drug Control Policy*. For information on issues pertaining to medical marijuana, see CRS Report RL33211, *Medical Marijuana: Review and Analysis of Federal and State Policies*.