
ISSUE REVIEW

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Ground Floor, State Capitol Building

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515.281.3566

Industrial Hemp Update

ISSUE

This **Issue Review** provides an update on the production of industrial hemp, including background information, an overview of state and federal activities in the United States, and a summary of activities in Canada.

AFFECTED AGENCIES

Department of Agriculture and Land Stewardship
Department of Public Safety
State Universities

CODE AUTHORITY

Iowa Code section [124.101](#)

BACKGROUND

Industrial Hemp Defined

Industrial hemp and marijuana are different varieties of the same type of plant – Cannabis Sativa L. The difference between the two plants are their [levels of tetrahydrocannabinol](#) (THC) and their usage. Industrial hemp has THC levels of 0.1% to 0.4% of the total plant weight and marijuana has THC levels of 4.0% to 7.0%. Industrial hemp is grown for commercial use and the stalks and seeds are used for textiles, food, paper, building materials, and other products. Marijuana is grown for medicinal and recreational uses.

Industrial Hemp History in the United States

Several states have grown industrial hemp. Industrial hemp was first planted near [Danville, Kentucky in 1775](#). The industry grew as industrial hemp was used to produce sailcloth, bale rope, and cordage. Illinois, Missouri, and Wisconsin also grew industrial hemp in in 1800's and the fiber was used primarily for sailcloth. By 1910, other states growing industrial hemp included Arkansas, California, Iowa, Indiana, Michigan, Minnesota, Nebraska, Pennsylvania, and Wisconsin.

The regulation of industrial hemp/marijuana began by the federal government in 1937 with the passage of the Marijuana Tax Stamp Act (Pub. L. No. 75-238). The Act placed a tax on the sale of industrial hemp/marijuana and made the possession of industrial hemp/marijuana illegal, except for some medical and industrial uses. That same year, the Iowa Legislature passed [HF 271](#) (Uniform Narcotic Drug Act) that made it illegal to possess, manufacture, or prescribe a narcotic drug that included Cannabis Sativa L.

The demand for industrial hemp increased when World War II began and fiber could no longer be imported from the Philippines. In 1942, the United States Department of Agriculture (USDA) and the United States Army encouraged farmers to grow industrial hemp for fiber as part of the Hemp for Victory Program. Participating farmers were issued marijuana tax stamps. The federal government also built 42 industrial hemp processing mills in Iowa, Illinois, Minnesota, and Wisconsin. Over 400,000 acres of hemp were cultivated between 1942 and 1945. The Iowa Legislature passed [SF 339](#) (Narcotic Drugs Act) in 1943, that allowed a person, firm, or corporation to grow cannabis for fiber use if they held a federal license.

Industrial hemp/marijuana was officially outlawed in the United States with the passage of the Controlled Substances Act (CSA) of 1970. This Act also classifies industrial hemp as a Schedule 1 controlled substance.

Growing industrial hemp has been reintroduced in the United States with the passage of [H.R. 2642](#) (2014 Farm Bill). [Section 7606](#) of the Agricultural Act of 2014 (7 U.S.C. §5940) legalizes the possession and use of industrial hemp if the crop is regulated by a state department of agriculture administering a pilot program. The federal law also authorizes an institution of higher education to produce industrial hemp in order to advance academic research. The federal law does not authorize a federal agency to implement or oversee the program. However, it also does not expressly supersede other federal laws that restrict items designated as controlled substances including the federal Controlled Substances Import and Export Act (U.S.C. §951 et seq.), requiring that cannabis seeds capable of germination only be imported into a state by persons registered with the Drug Enforcement Administration of the United States Department of Justice (DEA). The 2014 Farm Bill definition of industrial hemp is “the plant *Cannabis Sativa L.* and any part of such plant, whether growing or not, with a delta-9 tetrahydrocannabinol concentration of not more than 0.3 percent on a dry weight basis.”

The United States Department of Agriculture (USDA), in consultation with the federal DEA and the U.S. Food and Drug Administration (FDA), released a Joint [Statement of Principles on Industrial Hemp](#) in the Federal Register on August 12, 2016.

Current Federal Legislation

The federal Hemp Farming Act was introduced in April 2018 by Senator Mitch McConnell ([S. 2667](#)) and Representative James Comer ([H.R. 5485](#)). The Hemp Farming Act was intended to legalize hemp by removing it from the list of controlled substances and allowing states to be the primary regulators of hemp production. The legislation also would have removed regulations that limit hemp growers from obtaining financing, water rights, and crop insurance. The Hemp Farming Act was not passed; however, the language from the Act was included in the Agriculture Improvement Act of 2018 (Farm Bill). The Agriculture Improvement Act of 2018 was in conference committee until agreements were made in [House Resolution 1176](#). The Resolution passed Congress on December 12, 2018, and was signed by the President. The Resolution allows production of industrial hemp by a State or an Indian Tribe with the approval of the Governor and the chief law enforcement officer. Plans for industrial hemp production will be submitted to the federal Department of Agriculture.

Products Sold in the United States

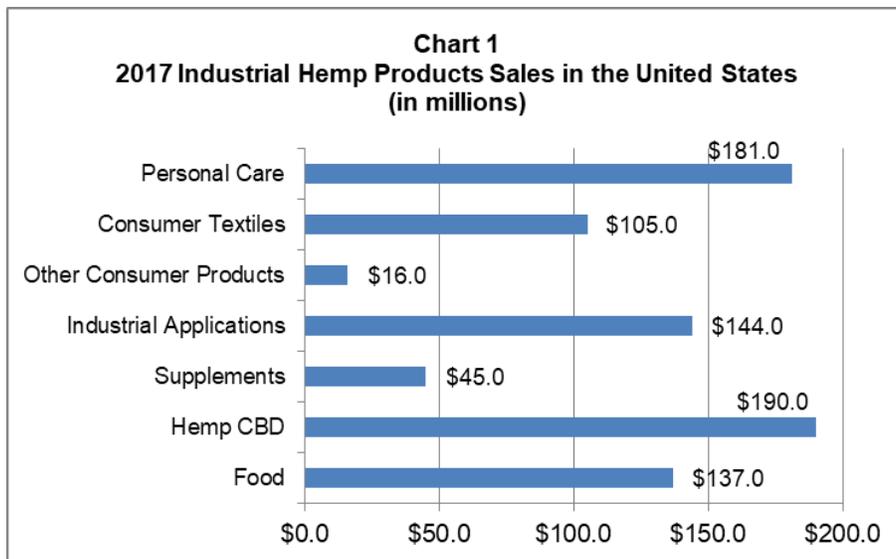
Industrial hemp is grown to produce a variety of products, as summarized in **Table 1** below.

**Table 1
Industrial Hemp Plant Product Uses and Benefits**

Stalk	Leaves	Flowers	Seeds	Benefits
<ul style="list-style-type: none"> •Consumer textiles for apparel. •Industrial textiles for rope, tarp, and canvas. •Writing paper and cardboard. 	<ul style="list-style-type: none"> •Building materials for fiberboard, insulation, and cement. •Animal bedding. •Mulch and compost. 	<ul style="list-style-type: none"> •Medicine. •Cannabidiol (CBD) oil. 	<ul style="list-style-type: none"> •Food products. •Oil paints. •Cosmetics. •Shampoos. •Lotions. •Granola. •Bird seed. •Animal feeds. 	<ul style="list-style-type: none"> •Suppresses weeds. •Uses less pesticide. •Less crop rotation. •Deep roots are natural soil aerators.

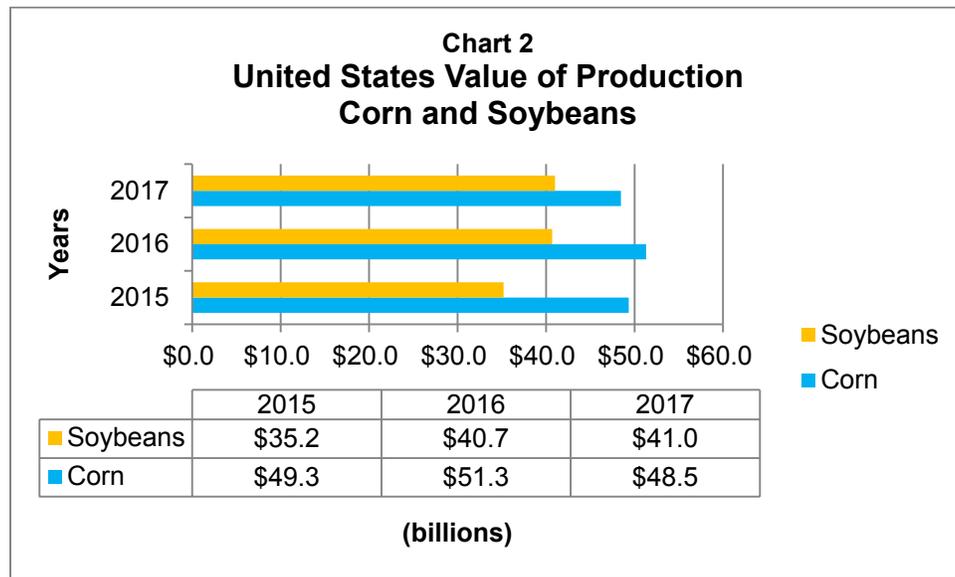
Source: hempbasics.com

Industrial hemp product sales in the United States are emerging but there is limited data available. The [Hemp Business Journal](#) estimated there were \$818.0 million in hemp-based products sold in the United States in 2017 (**Chart 1**).



Source: Hemp Business Journal

For comparative purposes, **Chart 2** summarizes the dollar value of production in the United States for corn and soybeans for calendar years 2015 through 2017. In 2017, the value of production for soybeans was \$41.0 billion and for \$48.5 billion for corn. Corn and soybeans can be used for a variety of products that include fuel, food products, plastics, feed, lubricants, pharmaceuticals, and cosmetics.



Iowa Interim Study

An [Industrial Hemp Program Study Committee](#) meeting was held on November 21, 2016, to evaluate the potential for and logistics of establishing an industrial hemp program in Iowa, including but not limited to the economic and environmental impact of establishing the program and regulatory aspects relating to industrial hemp production, and to submit recommendations, if deemed appropriate, to the General Assembly by January 1, 2017.

The Committee heard testimony from two panels of presenters and considered public comments. The first panel discussed information on industrial hemp from State employees that included:

- Robin Pruisner, State Entomologist, provided information on the regulation of industrial hemp and concerns for the Department of Agriculture and Land Stewardship.
- Dale Woolery, Iowa Office of Drug Control Policy, and Paul Feddersen, Department of Public Safety, discussed public safety concerns.
- Angie Rieck-Hinz, Iowa State University, discussed challenges for Iowa State University in establishing a research field.

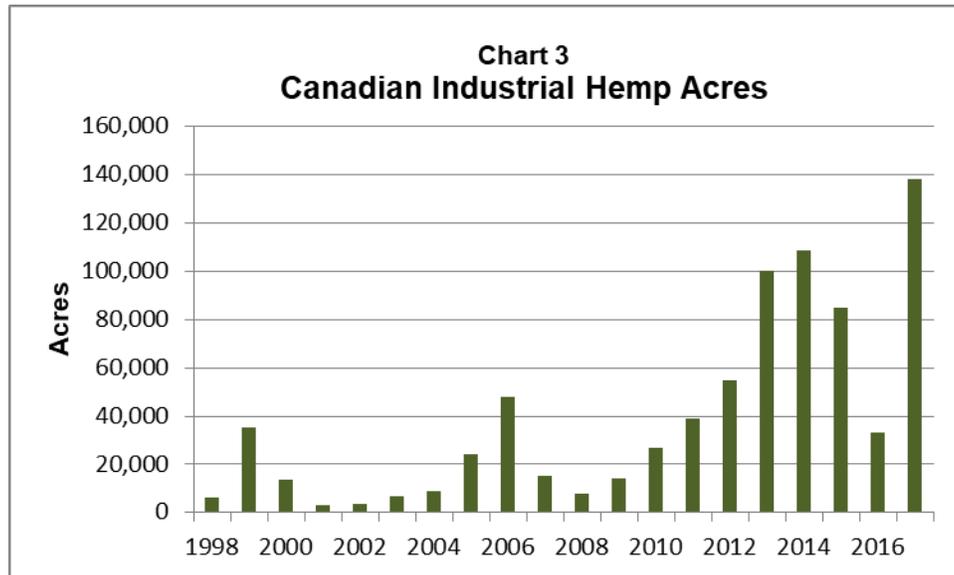
The second panel provided the following information:

- Dr. Christopher Disbro, Heartland Hemp Company, provided some production history on industrial hemp.
- Mike Lewis, a Kentucky farmer, discussed the logistics of growing and harvesting industrial hemp.
- Rick Trojan, a Colorado farmer, discussed industrial hemp product and market development.
- Mike Bowman, a Colorado farmer, discussed regulatory issues and market development.

The Committee did not make any recommendations to the Iowa Legislature.

Canada

Canada began growing industrial hemp in 1994 and regulated industrial hemp by distributing research crop licenses. The THC level of the industrial hemp cannot be more than 0.3%. Beginning in 1998, commercial licenses were distributed, and industrial hemp was harvested. Although the number of acres planted has varied since 1998, the industrial hemp market is growing. **Chart 3** details the number of industrial hemp acres planted from 1998 to 2017.¹



The market has varied over the years due to production, processing, and demand. For example, in 2015, Manitoba Harvest, the largest industrial hemp processor in Canada, offered production contracts to farmers and 85,000 acres were planted. However, demand for industrial hemp oil and other products declined in 2015 and production contracts were not offered in 2016, and only 30,000 acres were planted. During 2016, consumers in South Korea were buying products made from hempseed on a television shopping network and demand for industrial hemp increased. In 2017, there were 138,000 acres planted.

The number of acres that will be planted is expected to continue to increase since the Minister of Health and other officials at Health Canada revised [Section 56 of the Controlled Drugs and Substances Act \(SOR/98-156\)](#) in August 2018. The revision to the Controlled Drugs and Substances Act allows growers to collect and store the industrial hemp flowering heads, branches, and leaf material that contain cannabidiol (CBD). Industrial hemp produces higher levels of CBD than nonindustrial hemp. Products made from CBD include vaporizers, oil, balms, and food products. CBD products are not psychoactive and are used for treating various medical conditions, such as opiate addiction and depression. For example, on June 25, 2018, the FDA approved a plant-derived CBD drug called Epidiolex, used to treat epilepsy. Cannabidiol is still classified as a Schedule 1 substance.

It has been estimated that an industrial hemp crop could yield 10 to 15 pounds of CBD per acre, and using 135,000 planted acres, could produce 1.4 million to 2.0 million pounds of CBD in 2018. In western Canada, hemp growers receive from \$400 per acre for dryland conventional

¹ Renée Johnson, [Hemp as an Agricultural Commodity](#), Congressional Research Service, June 22, 2018.

industrial hemp to \$2,000 per acre for organic hemp. Using \$950 per acre as an average price, industrial hemp growers could earn \$130.0 million in gross sales in 2018.²

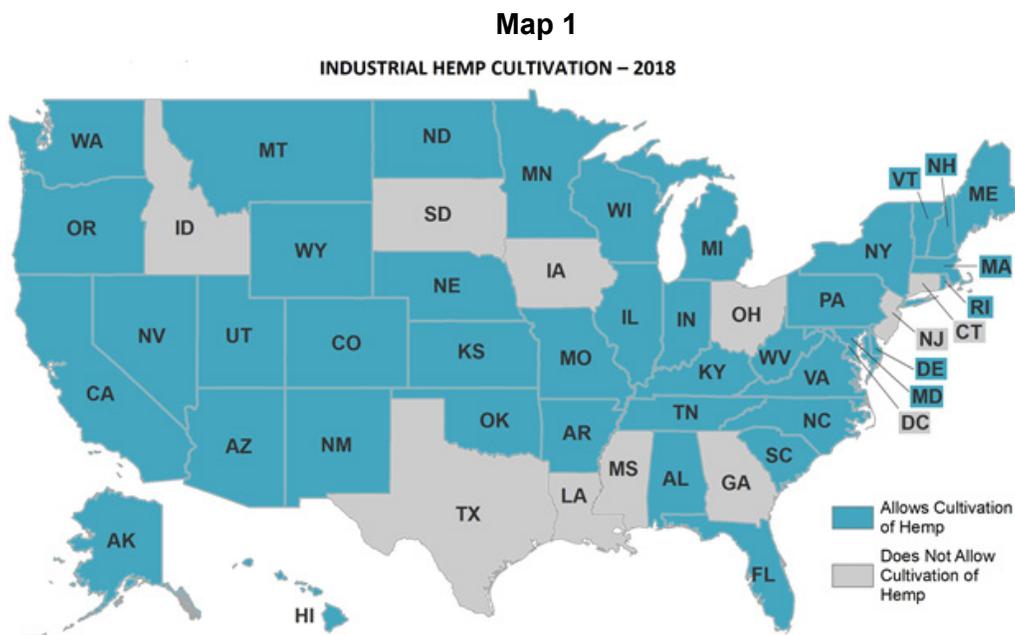
The United States imports 90.0% of industrial hemp products from Canada, including food-grade seed and oilcake. Other suppliers to the United States include China, which supplies between 3.0% to 5.0% of imports, and Romania, which supplies between 2.0% to 4.0% of imports.³

Other State Programs

The National Conference of State Legislatures (NCSL) in its summary of [State Industrial Hemp Statutes](#) reports that 41 states have passed legislation related to industrial hemp and 39 states have passed legislation that allows industrial hemp cultivation and production programs. Some state legislation requires a change in federal law or a waiver from the DEA prior to implementing their program.

Some state laws define industrial hemp as a variety of cannabis with a THC concentration of not more than 0.3%. West Virginia law defines industrial hemp as cannabis with a THC concentration of less than 1.0%. Other state law variations include allowing THC concentration on a dry weight basis and allowing THC concentration to be measured from any part of the plant. Most states require that a grower notify them prior to harvesting. The state agency will inspect the crop and collect samples that are tested for THC content

During 2018, five states enacted legislation for industrial hemp research and pilot programs. These states included Alaska, Arizona, Kansas, Missouri, and Oklahoma.⁴ **Map 1** details the states that allow the production of industrial hemp for commercial, research, or pilot programs.



Source: NCSL

² Terry Fries, [Hemp Growers Eye New Markets for 2018](#), AGCanada.com, August 16, 2018.

³ Renée Johnson, [Hemp as an Agricultural Commodity](#), Congressional Research Service, June 22, 2018.

⁴ National Conference of State Legislatures, [State Industrial Hemp Statutes](#), August 8, 2018.

Table 2 summarizes the average price per pound for industrial hemp products in the higher production states as reported by the Hemp Industry Daily and in the report, [Hemp as an Agricultural Commodity](#).

Table 2

2017 Industrial Hemp Production			
Average Price Per Pound for Hemp Product			
State	Flower	Seed	Acres
Colorado	\$ 28.00	\$ 9.00	9,700
Kentucky	\$ 35.00	\$ 0.75	3,100
Oregon	\$ 100.00	\$ 0.50	3,469
North Dakota	N/A	\$ 0.50	3,020
Minnesota	N/A	\$ 0.50	1,205
New York	\$ 100.00	\$ 1.38	2,000
North Carolina	\$ 25.00	\$ 1.00	965
Tennessee	\$ 100.00	\$ 10.00	200
Vermont	\$ 100.00	\$ 10.00	575
Nevada	\$ 200.00	\$ 10.00	417

Source: Hemp Industry Daily and Hemp as an Agricultural Commodity

Information on industrial hemp production in other states was summarized in the [Hemp Report: Top 10 U.S. States](#), (April 2018) produced by Hemp Industry Daily. Below is a summary on some of the states in the report.

Colorado — Industrial hemp production was approved by a vote referendum in 2012, and experimental plots were planted in 2013 before rules were developed by the Colorado Department of Agriculture. The industrial hemp industry continues to expand in Colorado. For industrial hemp grower license applicants, there are no application deadlines, acreage limits, or other requirements; however, the Colorado Department of Agriculture does complete a background check on all industrial hemp growers. Currently, there are 386 licensed growers, 12,000 outdoor acres, and 2.4 million square feet of indoor production. The plant is harvested for the flowers, seeds, seed oil, and fiber.

Oregon — Industrial hemp production was authorized in 2009; however, the Oregon Department of Agriculture began licensing in 2015. There are separate licenses for growers and processors. The cost per license is \$1,300 per year. Growers or processors producing industrial hemp seed must also purchase an industrial hemp seed permit for \$120 per year. The Oregon Department of Agriculture tests 100.0% of the industrial hemp fields for THC content. Most growers are growing plants for CBD oil. There are 233 licensed growers, 170 licensed processors, and 119 licensed seed producers. Oregon has 3,500 acres of industrial hemp planted.

North Dakota — Industrial hemp production was legalized in North Dakota in 1999, and production licenses were issued in 2016. In 2016, there were five licenses issued to grow industrial hemp, and 35 licenses in 2017. Production is limited to seed and fiber, and plants cannot be harvested for CBD. There is one processor in the state for seed oil, which is used for food products, and no fiber processor. There are 35 licensed growers and 3,100 industrial hemp acres planted.

Minnesota — Industrial hemp production began in 2016 with 40 acres. In 2017, there were 47 applications for industrial hemp production, and 40 entities were licensed. This included 33 industrial hemp growers, two testing laboratories, one industrial hemp seed dealer, one researcher, and three processors. The Minnesota Department of Agriculture's [2017 Industrial Hemp Pilot Program Annual Report](#) includes information on input costs, harvesting, and other issues.

New York — Industrial hemp production began in 2015 with a limit of 10 licenses for educational institutions, farms, or businesses to grow and research industrial hemp. In 2017, the limit was removed and there were 21 licenses awarded for a total of 2,000 acres. Also, in 2017, the governor set aside \$5.0 million in development grants for industrial hemp entrepreneurs. In 2018, the New York Department of Agriculture and Markets received 100 applications to grow industrial hemp and 12 applications for processing industrial hemp. Industrial hemp is used for CBD extraction, seed oil extraction, seeds, and fiber, and the leaves are also used for food.

FISCAL INFORMATION

Industrial Hemp Economic Data

The University of Kentucky published a study on industrial hemp economic factors in 2013 entitled [Economic Considerations for Growing Industrial Hemp: Implications for Kentucky's Farmers and Agricultural Economy](#). **Table 3** compares the returns from growing industrial hemp from seed to the returns from growing corn or soybeans.

Table 3
2013 Industrial Hemp Return Per Acre — Kentucky

Seed Price Per Pound	Low Productivity	Medium - Low Productivity	Medium - High Productivity	High Productivity
Industrial Hemp				
\$0.50	\$ (2.00)	\$ 66.00	\$ 134.00	\$ 202.00
\$0.60	\$ 58.00	\$ 141.00	\$ 224.00	\$ 307.00
\$0.70	\$ 118.00	\$ 216.00	\$ 314.00	\$ 412.00
\$0.80	\$ 178.00	\$ 291.00	\$ 404.00	\$ 517.00
Corn/Soybean Rotation				
(\$5 bushel corn and \$11.25 bushel soybean)	\$ 121.00	\$ 206.00	\$ 289.00	\$ 369.00

Source: Department of Cultural Economics, University of Kentucky

Cornell University published a study entitled [Economics of Producing Industrial Hemp in New York State: Costs of Production Analysis, 2017](#). **Table 4** summarizes the variable and fixed costs per acre for producing industrial hemp in New York in 2017.

Table 4
2017 Industrial Hemp Costs Per Acre — New York

Cost Item	Hemp Fiber	Hemp Fiber/Seed	Hemp Seed
Variable Costs			
Fertilizer	\$ 69.15	\$ 69.15	\$ 69.15
Seed	\$ 133.33	\$ 50.00	\$ 66.67
Crop Inputs	\$ 18.22	\$ 46.81	\$ 71.71
Labor	\$ 27.10	\$ 33.87	\$ 12.25
Equipment Repair	\$ 15.57	\$ 41.39	\$ 30.41
Fuel	\$ 11.71	\$ 20.03	\$ 12.55
Interest on Capital	\$ 6.88	\$ 6.54	\$ 6.57
Total Variable Costs	\$ 281.96	\$ 267.79	\$ 269.31
Fixed Costs			
Tractors	\$ 25.89	\$ 54.17	\$ 38.81
Equipment	\$ 19.11	\$ 29.24	\$ 20.56
Land Charge	\$ 100.00	\$ 100.00	\$ 100.00
Total Fixed Costs	\$ 145.00	\$ 183.41	\$ 159.37
Total Costs	\$ 426.96	\$ 451.20	\$ 428.68

Source: Cornell University

Iowa Legislation

In April 2018, the Iowa Senate passed [SF 2398](#) (Iowa Industrial Hemp Bill), which authorized the production, processing, and marketing of industrial hemp in Iowa. The Department of Agriculture and Land Stewardship (DALs) was designated to administer the Industrial Hemp Commodity Program, and Iowa State University was designated to administer the Industrial Hemp Production Program. Both programs would have allowed farmers who were licensed by the DALs to participate. The bill was not passed by the House.

Some of the concerns in implementing an industrial hemp program in Iowa include:

- Obtaining certified seeds for Iowa growers. Currently, a state must register with the federal DEA to obtain certified industrial hemp seed, and often the seed is imported from Canada. Changes in federal law could possibly allow states to purchase industrial hemp seed from other states. [SF 2398](#) specified that the Iowa Crop Improvement Association would certify seeds for Iowa producers and also allowed the DALs and registered growers to sell industrial hemp seed.
- Prohibition of CBD production. The legislation prohibits the growing of industrial hemp for CBD production.
- Testing methods for the level of THC in plants and the process for destroying plants that exceed maximum allowed THC levels. In [SF 2398](#), the DALs was designated as the agency to test plants, or had the ability to hire a private or public laboratory. Other states operate in similar ways.

- In Nevada, all industrial hemp products that are intended for human consumption must be tested. The testing for usable industrial hemp sold at retail must be conducted on a batch of 50 kilos or less.
- In Wisconsin, the industrial hemp growers must notify the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) at least 30 days before harvest and inspectors collect industrial hemp samples that are then tested in the laboratory. A “fit for commerce” certificate is issued for samples that pass the laboratory test. Samples that fail the test can be retested once with the costs paid by the grower. Fields with failed crops must be destroyed in 10 days.
- The estimated costs for [SF 2398](#) were \$161,000 for the first year of production. This included \$91,000 for 1.0 full-time equivalent (FTE) position in the DALs to implement the Industrial Hemp Commodity Program and a one-time cost of \$70,000 for equipment. Examples of the specific equipment needed for industrial hemp production include:
 - Geno/Grinder (to take samples of plant tissue).
 - Sieves (to remove impurities from test samples).
 - Knifetec Sample Mill (to grind samples without moisture loss).
 - Desiccators (sealed containers that absorb moisture).
- The Department of Public Safety identified costs of \$30 to \$50 for obtaining fingerprints and completing a background check for an industrial hemp grower applicant. These costs would be paid by the applicant.

LSA Staff Contact: Deb Kozel (515.281.6767) deb.kozel@legis.iowa.gov

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