

2023 Hemp Program Annual Report

Plant Protection Division
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Minnesota Hemp Program

History

The 2014 Farm Bill contained a provision to allow state departments of agriculture to administer pilot programs to study the growth, cultivation, and marketing of hemp. In 2015, the Minnesota Industrial Hemp Development Act (IHDA) (MINN. STAT. § 18K) became law. This allowed the Minnesota Department of Agriculture (MDA) to create a hemp pilot program in accordance with the Farm Bill. The Minnesota Hemp Pilot Program operated from 2016 through 2020.

The 2018 Farm Bill officially legalized hemp cultivation for commercial purposes by amending the Agricultural Marketing Act of 1946 to include a section on Hemp Production (7 USC § 1690o et. Seq.) and descheduled hemp under the Controlled Substances Act (21 USC § 812). On October 31, 2019, the United States Department of Agriculture (USDA) released the Interim Final Rule (84 FR 58522), which formed the regulatory framework for all hemp cultivation nationwide. Each state and tribal authority had to submit a plan to the USDA to regulate hemp at the state/tribal level. The Minnesota State Hemp Plan was approved in July 2020 and became effective January 1, 2021.

On January 15, 2021, the USDA released the Final Rule (7 CFR 990). The Final Rule contained key changes from the Interim Final Rule based on comments from states, growers, and others in the hemp industry. The revised Minnesota State Hemp Plan, updated to incorporate the federal Final Rule for commercial hemp regulation, was approved by the USDA and went into effect on May 6, 2021.

Upon approval of the State Hemp Plan following the codification of the federal Final Rule for hemp, the MDA published rules for Chapter 18K (Minnesota Rule § 1565) in the fall of 2021. These rules mirror the regulatory requirements outlined in the State Hemp Plan and give the MDA full enforcement authority under state law for hemp production and raw hemp processing in the state.

The Minnesota State Plan was revised again in late 2023 to include the codification of Minnesota's administrative rules and a few minor changes to the state statute. The revised Minnesota State Hemp Plan was approved by the USDA and went into effect on December 12, 2023. The Minnesota plan can be viewed in its entirety on the [USDA Domestic Hemp Program website](#).

This report only covers the activities included under the MDA Hemp Program. To view hemp plans for tribal entities in Minnesota, please [visit the USDA website](#).

Background

Hemp Program applicants must register their specific growing and raw hemp processing locations and pay the annual program fees. Table 1 provides an overview of the Minnesota Hemp Program since it began in 2016. Some licensees hold both Grower and Processor license categories; therefore, in those situations they are double counted in the licensed processor statistic.

Table 1. Minnesota Licensing and Acreage Statistics 2016-2023

Statistic	2016	2017	2018	2019	2020	2021	2022	2023
Applicants	7	47	65	505	586	459	299	312
Licensed Growers	6	33	43	353	461	348	240	230
Licensed Processors	0	5	21	214	232	247	151	158
Outdoor Acreage Planted	38	1,202	711	7,353	4,690	2,830	375	834
Indoor Square Footage Planted	0	0	54,618	403,304	1,353,489	318,713	122,040	68,771

THC Testing

Hemp is defined under state and federal law as the plant *Cannabis sativa* L. and any part of the plant, whether growing or not, including the plant's seeds, and all the plant's derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, with a delta-9 tetrahydrocannabinol (THC) concentration of no more than 0.3% by dry weight. Federal hemp law requires states and tribes to include testing protocols in their plans that utilize post-decarboxylation methods for pre-harvest cultivation tests to certify lots grown as hemp. Post-decarboxylation converts THCA in the plant to delta-9 and provides the Total THC measurement. Compliance of a hemp lot is based on whether the % Total THC result determined on a dry weight basis includes a value of 0.3% within a range of values specified by plus or minus the measurement of uncertainty. The measurement of uncertainty adopted by the MDA Hemp Program is based on the laboratory measurement of uncertainty plus sampling variability. The measurement of uncertainty for 2023 was approximately 24% of the value of the % Total THC test results.

Growers are required by law to report the location of each variety/lot of hemp that they plant to the MDA for regulatory sampling by a trained inspector no more than 30 days prior to harvest. To sample a hemp lot, the inspector takes a cutting from 30 different plants randomly selected throughout the population. The top 5 inches of the female flower are cut from each of the 30 plants, and the cuttings are placed in a single paper bag. The plant material is dried and homogenized by grinding prior to the laboratory analysis for Total THC. Lots which have less than 30 plants are sampled proportionally. All planted varieties are sampled and tested separately.

The pilot program and original state plan under the interim federal hemp rule required the MDA to sample and test every hemp lot produced in Minnesota. However, the Final Hemp Rule, and current state hemp plan, allows the MDA to establish random sampling of hemp lots based on risk-based factors, if the sampling plan ensures 95% confidence that hemp entering the marketplace meets the legal threshold for THC. In 2023, 11 lots were deemed to be low risk based on the parameters laid out in the state hemp plan. Five of those lots were not

sampled due to destruction by the growers because of poor yields. The remaining six low risk lots were sampled by the growers themselves according to a sampling protocol supplied by the MDA and sent to the state approved accredited laboratory that processes all regulatory samples for hemp produced in Minnesota. Five of the growers sampled low risk lots passed. The one grower sampled low risk lot that failed was of the double black CBG variety.

In 2023, the MDA collected 152 samples from hemp lots produced by licensees. Of those, 24 tested above the 0.3% THC threshold. The failure rate for initial THC tests was 15%. The failure rate for 2023 was higher than previous years, with 12% in 2021 and 9% in 2022. The range of the THC concentration for the 2023 failed samples is provided in the table below. The largest number of failures fell in the range of 0.40-0.59 (Table 2). Growers with a hemp lot that tested above the acceptable THC level were required to destroy their lot, unless remediation was an option. Hemp remediation can only occur for failed lots testing above 0.3% and under 1%. All sampled lots that test above 1% must be destroyed. In 2023, 16 Minnesota hemp growers had lots that tested above the acceptable THC level resulting in 1.4 acres of hemp destroyed.

Table 2. Range of THC concentration test results for 2023 failed hemp samples (Total Delta-9 THC post-decarboxylation)

THC Results Range	0.40-0.49	0.50-0.59	0.60-0.69	0.70-0.79	0.80-0.89	0.90-0.99	1.0-1.99
Sample Count	9	6	1	2	2	1	3

A negligent violation was issued to growers that grew cannabis that tested above 1% Total THC. Growers who receive a negligent violation must submit a corrective action plan to the MDA that demonstrates how the violation was corrected and list procedures that will be incorporated in future grows to demonstrate compliance. Three negligent violations were issued this year. A grower can only receive one negligent violation per year. Furthermore, under the state plan and the federal final rule, if a grower receives three negligent violations in a five-year period, the grower cannot participate in the hemp program for five years.

For 2023, there were four fiber lots that tested above the allowable threshold. Three of the four fiber lots that failed were the same variety, Yuma. Other states and universities have reported that Yuma and some other fiber varieties from China are known to test above 0.3% Total THC.

High-cannabidiol (CBD) varieties accounted for 79% of the total failed samples in 2023. Newer varieties of hemp continue to be a source of concern. Growers must use caution when sourcing genetics. Despite assurances from the vendor claiming that a variety is guaranteed to be low in THC, there is always the possibility of the plants testing above the THC threshold. There are many factors that affect THC production, including nutrients, light regime, genetics, and crucially, length of time under cultivation. Correct timing, testing, and harvesting is essential. In Minnesota, there have been hemp crops grown from the same seed source, planted in different fields, in which one failed and the other passed the THC regulatory test. Improved plant breeding for stable genetics acclimated to specific climates and environments may help to significantly lower the number of failed sampled lots in the future.

It is also important to plant seed that has been produced under controlled conditions. Hemp plants that have been open-pollinated are unpredictable. There have been several growers in Minnesota that saved and grew seed harvested from their previous production, without controlling the cross-pollination, and the offspring were much higher in THC than the parent plants.

The MDA Hemp Program does not test for CBD or other cannabinoid concentrations during regulatory testing, only Total THC. The MDA does not have comprehensive data on these other cannabinoids. One important point to note is that seed companies will often provide their buyers a Certificate of Analysis (COA) of the variety at full maturity to show the highest potential CBD level. However, research into COAs by states and tribes have shown that the THC levels are often above 0.3% at that same maturity level. It is important when purchasing seed to fully understand the genetics and test results from the parent plants of the seed purchased. MDA fully supports additional genetic research for producing more stable hemp varieties using sound plant breeding practices and evaluation.

To help growers make better choices when selecting varieties, the MDA publishes a spreadsheet each year which summarizes the following information about each hemp variety grown in Minnesota. The spreadsheet can be found on the [MDA Hemp Program's webpage](#).

- Number of samples collected
- Average Total THC level
- Lowest and highest recorded Total THC level
- % of samples above 0.30% Total THC
- If mandatory testing is required by the MDA

Remediation

Remediation is the process of rendering non-compliant cannabis, compliant. This was the third year remediation was available to growers that had lots that tested between 0.3% and 1% Total THC. The grower can choose from two different remediation options. Remediation can occur by removing and destroying floral material, while retaining stalk, stems, leaf material, and seeds. Remediation can also occur by shredding the entire plant into a biomass like material. The material must be retested by the MDA and meet the definition of hemp before being allowed into manufacturing and commerce. Remediated lots that are compliant receive a Fit for Commerce Certificate. In 2023, remediation was attempted on 3 non-compliant lots that were grown for fiber. Of those 3 lots, all were successfully remediated. The increase in the success rate of remediation attempts from 65% in 2021 to 80% in 2022 to 100% in 2023 is promising. Remediation is not a viable option for all non-compliant lots but does provide the grower with another option.

Hemp Planted

The program saw an increase in the number of applicants from 2022; however, the number of licensees decreased slightly. The discrepancy can be contributed to applicants that applied for a hemp license but did not complete the criminal history background check requirement which is the final step in the application process. Over a third of licensees that paid for a grower's hemp license in 2023, did not end up planting. There was a 9% increase in the number of licensees that did not grow from 2022. Many licensees plan to apply for an adult-use

cannabis license when that is available and believe that holding an active hemp license will be beneficial in helping them with that endeavor. They had no plans to cultivate or process hemp in 2023.

In 2023 there were 834 acres of hemp planted. The greatest amount of acreage was planted for fiber production at 82% (Table 3). Grain production followed at 12% of the total acres planted. Cannabinoid production totaled 6% of the acreage planted. The switch from primarily cannabinoid production to fiber production has also been seen on a national level.

There were 814 acres harvested in Minnesota with approximately 20 acres lost to natural causes. The natural causes ranged from weeds, poor germination, drought, other weather-related events, and pest/animal damage. Last year was another dry year with several growers reporting poor germination and yields. Growers continue to find managing weed pressure and harvest challenging.

Table 3. Percentage of acreage grown per crop type by year

Statistic	2016	2017	2018	2019	2020	2021	2022	2023
% Acres Planted for Grain	94.7%	99.3%	89.5%	25.2%	48%	39%	35%	12%
% Acres Planted for CBD	0.0%	0.4%	9.6%	74.4%	38.6%	52%	60%	5%
% Acres Planted for CBG					4.7%	3%	1%	1%
% Acres Planted for Fiber	5.3%	0.3%	0.9%	0.4%	8.7%	6%	4%	82%

Processors

There were 158 hemp processors licensed in Minnesota in 2023. A processor is defined as any person or business that converts raw hemp into a product. An MDA Hemp Program license is not required for hemp product manufacturing after it is processed out of its raw form, nor for retail sales. There is still a bottle neck when it comes to processing as many of the licensed processors do not purchase and process raw hemp on a large scale.

For 2023, the program inspected nine processing facilities. The inspection included a request of the licensee’s records and data, such as those pertaining to the acquisition, production, handling, selling, and disposal of all plants. Records must be maintained by the licensee for three years. The inspections proved to be very insightful for both the program staff and licensees.

Authority was moved from the Minnesota Board of Pharmacy to the Minnesota Department of Health, Office of Medical Cannabis, to regulate the sale of hemp extracts and cannabinoid products for human consumption in Minnesota. As of July 1, 2022, that includes edible cannabinoid products which are intended to be consumed by humans, contain a cannabinoid in combination with food ingredients, and are not drugs. The MDA Hemp Program did see a slight increase in the number of processors in 2023 due to the passage of that legislation.

Summary

This year proved to be an interesting year with a massive switch in the type of hemp planted. Starting in 2019, cannabinoid production has been one of the leading crop types planted in Minnesota. Since 2016, fiber production never accounted for more than 9% of the acreage planted. For 2023, 82% of the acreage planted was for fiber. Cannabinoid production came in at 6% of the acreage planted despite accounting for 84% of growers intended use on the Planting Reports that were submitted. Over a third of the licensees that intended to plant at the beginning of the year did not end up planting. Most of those licensees stated they were interested in growing for CBD when applying, which contributed to the decrease in cannabinoid acreage planted.

The continued interest in hemp is not surprising with all the possible uses. Hemp has dramatically increased in popularity, public awareness, and acceptance. More investment in processing infrastructure, demand for products, and new innovations continue to improve each year and offer hemp a bright future. To build a sustaining industry, it will also be important to continue to put in place regulations that benefit farmers and processors while creating a level playing field.

Growing and processing hemp certainly provided good opportunities for some in the MDA Hemp Program but have also resulted in crop and financial loss for others. Growers need more ways of connecting with trustworthy buyers and help with marketing their products. Proper plant breeding and genetic selection continues to be an important issue for the hemp industry to flourish moving forward. With the changing landscape of cannabis laws in Minnesota and nationally, anyone considering becoming a licensed hemp grower or processor in Minnesota must carefully examine and understand the current regulations, grey legal areas, newly proposed laws for cannabis, and the impacts they may have on the hemp industry.

As we look ahead to 2024, we anticipate the hemp industry in Minnesota continuing to move towards fiber production. We foresee those interested in cannabinoid production shifting to the adult-use cannabis market resulting in less applicants to the hemp program. The change in focus from primarily cannabinoid production to fiber production should result in more acreage of hemp grown in the state and turn the focus back to the industrial purposes of hemp.

For More Information

Minnesota Hemp Program

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www.mda.state.mn.us/plants/hemp

[Minnesota](#) Industrial Hemp Plan

www.ams.usda.gov/sites/default/files/media/MinnesotaIndustrialHempPlan.pdf

[USDA Hemp](#) Information www.ams.usda.gov/rules-regulations/hemp/information-state-departments-agriculture-and-tribal-governments

[Frequently](#) Asked Questions – MDA Hemp Program www.mda.state.mn.us/plants/hemp/industhempquestions