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# Hemp Program

2022 Annual Report

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# Contents

- Minnesota Hemp Program ..... 1
  - Background..... 2
  - THC Testing..... 2
- Remediation ..... 4
- Hemp Planted ..... 5
- Processors..... 5
- Summary..... 6
- For More Information..... 6

## Minnesota Hemp Program

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 contains 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. The Minnesota plan can be viewed in its entirety on the USDA Domestic Hemp Program website.

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.

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 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; they are double counted in the licensed processor statistic.

**Table 1. Minnesota licensing and acreage statistics 2016-2022.**

Statistic	2016	2017	2018	2019	2020	2021	2022
Applicants	7	47	65	505	586	459	299
Licensed Growers	6	33	43	353	461	348	240
Licensed Processors	0	5	21	214	232	247	151
Outdoor Acreage Planted	38	1,202	709	7,353	4,690	2,830	375
Indoor Square Footage Planted	0	0	54,618	403,304	282,790	318,713	122,040

## 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. The 2018 Farm Bill specified that delta-9 THC must be determined post-decarboxylation (Total THC). 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 2022 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.

**Figure 1. An MDA inspector taking a sample of a hemp plant.**



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 2022, 10 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 five 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. All the grower sampled low risk lots passed.

In 2022, the MDA collected 289 samples from hemp lots produced by licensees. Of those, 31 tested above the 0.3% THC threshold. The failure rate for initial THC tests was 9%. The failure rate for 2022 was lower than previous years, with 10% in 2020 and 12% in 2021. The range of the THC concentration for the 2022 failed samples is provided in the table below. The largest number of failures fell in the range of 0.40-0.69 (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 2022, 13 Minnesota hemp growers had lots that tested above the acceptable THC level resulting in 3.6 acres of hemp destroyed. In comparison, nationally there were 650 acres destroyed due to non-compliance.

**Table 2. Range of THC concentration test results for 2022 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	2.0 +
Sample Count	10	9	4	1	1	2	2	2

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. Two 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.

High-cannabidiol (CBD) varieties accounted for 97% of the total failed samples in 2022. There was one experimental fiber lot grown that failed. Newer varieties of hemp continue to be a source of concern, especially those varieties being bred for cannabinoid production. 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 near 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 the 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 of the variety at full maturity to show the highest potential CBD level. However, the THC levels are almost certainly above 0.3% at that maturity level, so it is not realistically possible to achieve those yields.

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 second 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 and meet the definition of hemp. Remediated lots receive a Fit for Commerce Certificate. In 2022, remediation was attempted on 10 non-compliant lots. Of those 10 lots, eight were successfully remediated. Two lots still did not meet the allowable threshold of 0.30% Total THC after the remediation attempt and were destroyed. The increase in the success rate of remediation attempts from 65% in 2021 to 80% in 2022 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 lower numbers this year. The number of applicants for 2022 decreased by 160 people when compared with 2021. Minnesota, along with most other states, experienced decreased applicants and planted acreage. Minnesota ranked in the top five of the states with the largest number of producers who planted. The states that had the largest number of acres planted were states that had predominantly grown fiber. Approximately 27% of Minnesota licensees that planned to grow, did not end up planting. The reasons for not planting ranged from not being ready to endure personal hardships to not choosing an ideal location to grow and so on.

Approximately 375 acres of hemp was planted in Minnesota in 2022. The greatest amount of acreage was planted for CBD production in 2022 at 60% (Table 3). Grain production followed at 35% of the total acres planted, fiber only constituted 4%. There was also a small amount of acreage devoted to CBG production (1%). On a national level, there were nearly 2,600 producers that planted an estimated 20,800 acres of hemp in 2022. Most of the acres planted nationally was grown for fiber at 40.55% followed by cannabidiol at 35.65%.

A total of 15,500 acres were harvested nationally with 4,650 acres lost to natural causes. There were 304 acres harvested in Minnesota with approximately 70 acres lost to natural causes. The natural causes ranged from weeds, poor germination, drought, other weather-related events, and pest/animal damage. Some of the growers experienced increased pest pressure this year, especially from grasshoppers. Growers continue to find managing weed pressure and harvest challenging. Many of the returning growers are opting to grow indoors to better manage the numerous factors that could contribute to lost lots for cannabinoid cultivation.

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

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

## Processors

There were 156 hemp processors licensed in Minnesota in 2022. 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.

The Minnesota Board of Pharmacy regulates the sale of hemp extracts and cannabinoid products for human consumption in Minnesota. As of July 1, 2022, this 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 program did not see an increase in the number of processors in 2022 due to the passage of this new legislation because the application period for 2022 licenses ended on April 30. There is confusion circulating on hemp-derived product processing and licensure that is required, which will hopefully be resolved during the next legislative session.

## Summary

Even though program numbers for 2022 were lower than previous years, when looking back over the years of the Minnesota Hemp Program, hemp has dramatically increased in popularity, public awareness, acceptance, and the overall program has expanded significantly. More investment in processing infrastructure, demand for products, and new innovations will need to continue to offer hemp a brighter 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. The new edible cannabinoid product legislation that passed in 2022 is seen as a positive step in the right direction for many of those in the Minnesota hemp industry.

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 2023, we anticipate the hemp industry in Minnesota to experience more changes. We do foresee increased interest in hemp due to the legalization of hemp-derived edible cannabinoid products and possibly new opportunities with cannabis in general.

## For More Information

### Minnesota Hemp Program

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