



**PLANT INDUSTRIES  
DIVISION**

**Arkansas Department of Agriculture  
Industrial Hemp Production Plan**

November 2, 2021

**Arkansas Department of Agriculture**

1 Natural Resources Drive  
Little Rock, AR 72205

[www.agriculture.arkansas.gov](http://www.agriculture.arkansas.gov)





Asa Hutchinson  
Governor

# ARKANSAS DEPARTMENT OF AGRICULTURE

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Wes Ward  
Secretary of Agriculture

November 2, 2021

Sent via email to [Farmbill.Hemp@usda.gov](mailto:Farmbill.Hemp@usda.gov)

The Honorable Thomas J. Vilsack  
Secretary of Agriculture  
U.S. Department of Agriculture  
1400 Independence Ave., S.W.  
Washington, DC 20250

Dear Secretary Vilsack:

We wish to thank you and your team at the United States Department of Agriculture ("USDA") for your continued dedication to promoting economic opportunity and agricultural production in the state of Arkansas. On behalf of the Arkansas Department of Agriculture ("Department"), I submit to you the Arkansas Department of Agriculture Hemp Licensing Program state production plan to permit the Department the authority to regulate and monitor legal hemp production in Arkansas.

Under the authority of the 2014 Farm Bill (7 U.S.C. § 5940) and the Arkansas Industrial Hemp Act of 2017 (A.C.A. § 2-15-401 *et seq.*), the Department has worked diligently over the last several years to develop a Hemp Research Licensing Program that assists Arkansas farmers in researching potential agricultural market opportunities and production methods associated with legal hemp production.

Since the passage of the Agricultural Improvement Act of 2018 (21 U.S.C. § 801 *et seq.*) and the Arkansas Hemp Production Act (A.C.A. § 2-15-501 *et seq.*), the Department has worked diligently to create an Industrial Hemp Licensing Program that not only meets federal requirements, but one that also considers the needs of Arkansas farmers navigating within this emerging agricultural industry.

To assist the United States Department of Agriculture in its review, the Department has also included the "State and Tribal Government Plan Requirements" document published on USDA's website in italicized text along with the Department's response to each requirement.

I look forward to our continued partnership with USDA and appreciate your consideration of Arkansas's plan to regulate the domestic production of hemp.

Respectfully,

Wesley W. Ward  
Secretary of Agriculture  
State of Arkansas

**Requirements for State and Tribal Hemp Plans**

**ARKANSAS DEPARTMENT OF AGRICULTURE HEMP PROGRAM**

**1) Plans to maintain relevant producer and land information.**

- *Collect, maintain and provide to USDA contact information for each hemp producer licensed or authorized in the state or territory of the tribal government (whichever applicable). [990.3 (a) (1)]*

**Department Response:** The Arkansas Department of Agriculture (“Department”) will require applicants to complete the applications entitled “*Grower Application*” and “*Processor/Handler Application*,” as well as a *Licensing Terms & Conditions* between the Department and the applicant. Both applications will require the applicant’s contact and geospatial information for all growing, handling, storage and processing sites where hemp material will be present. The Department will not approve incomplete applications for licensure with the Hemp Licensing Program (“Program”) that do not include all the information mentioned in Section 2 of the Program Rules. The Department has the ability to generate custom reports and will provide those reports to USDA on a reoccurring monthly schedule, or upon request, in the information sharing format determined by USDA. **See Section 2(B)(1)&(2) of Program Rules**

- *Provide contact information for each hemp producer covered under the plan including name, address, telephone number, and email address (if available). If the producer is a business entity, the information must include the full name of the business, address of the principal business location, full name and title of the key participants, an email address (if available), and EIN number of the business entity. This information can be provided via the AMS-23 form via mail, fax, or email. [990.3 (a) (1) (i)]*

**Department Response:** The Department will require applicants to complete the applications entitled “*Grower Application*” and “*Processor/Handler Application*.” All information mentioned above ([990.3 (a) (1) (i)]) is required for licensure with the Program per Section 2 of the Program Rules. The Department has the ability to generate custom reports and will provide the information mentioned above to USDA on a reoccurring monthly schedule, or upon request, in the information sharing format deemed acceptable by USDA. **See Section 2 of Program Rules**

- *Provide a legal description of the land where hemp is produced in the state or tribal territory. [990.3 (a) (1) (ii)]*

**Department Response:** The Department will require applicants to complete the applications entitled “*Grower Application*” and “*Processor/Handler Application*.” The Department will require all applicants to submit a legal land description for all sites requested for licensure to produce or grow industrial hemp in Arkansas. Additionally, the Department requires applicants to provide detailed descriptions, labeled aerial maps, and geospatial locations of each growing, storage, processing, and handling site, otherwise known in the Program as “Location IDs.” Location IDs

include the licensed location's street address and six-digit GPS coordinates in decimal-degree format. Applicants are required to indicate whether the property is owned or controlled/leased by the applicant. Additionally, pursuant to Program Rules Section 2(B)(1)(o), licensees are required to notify the Department within one (1) month if there are any changes or deviations to licensed locations or sites. Licensees are not permitted to grow, process, handle, or store hemp material at any requested Location ID until approval in-writing is received from the Department. **See Section 2 & Section 2(B)(1)(o) of Program Rules**

- *Maintain and report to USDA status of licensed producers (and any changes) and license or authorization numbers of producers. [990.3 (a) (1) (iii)]*

**Department Response:** The Department has developed a Program document entitled "*Site Modification Request Form*," which is required to be submitted to the Department by the licensee for approval prior to any Location ID site changes. Pursuant to Program Rules Section 2(B)(o), licensees are required to notify the Department of any location or license changes within one (1) month. Licensees are not permitted to grow, process, handle, or store at any requested Location ID site until approval in-writing is received from the Department. The Department has software capabilities to generate custom reports that include the information mentioned in [990.3 (a) (1) (iii)] and will provide those reports to USDA on a reoccurring monthly schedule or upon request in a manner prescribed by USDA. **See Section 2(B)(1)(o) of Program Rules**

**2) *Plan for accurate and effective sampling and testing using post-decarboxylation or similar reliable methods. [990.3 (a) (2)]:***

- *Standard sampling and performance-based sampling procedures must be sufficient at a confidence level of 95 percent that no more than one percent of the plants in each lot would exceed the acceptable hemp THC level and ensure that a representative sample is collected that represents a homogeneous composition of the lot.*

**Department Response:** The Department has adopted a procedure for sampling and collecting floral hemp material prior to harvest, established by an annually published guidelines document entitled "*Sampling, Testing, Remediation and Disposal Guidelines*," as prompted by Program Rules Section 11 and A.C.A. § 2-15-509(e). The sample collection will be conducted by an authorized Department representative and will be administered in accordance with the sampling procedures detailed within the Program guidelines document. The Department intends to sample and inspect 100% of all lots produced under the Program. To ensure standard sampling at a confidence level of 95 percent that no more than one percent of the plants in each lot would exceed the acceptable hemp THC level, the Department has adopted the USDA-AMS's sampling matrix from the USDA-AMS's guidelines document entitled "*Sampling Guidelines for Hemp*." The sampling matrix, **Table 3A & 3B of "Sampling, Testing, Remediation and Disposal Guidelines,"** determines the number of cuttings needed for sampling from a lot size in acres of a growing area

requested for harvest. **See Section 11 of Program Rules, A.C.A. § 2-15-509(e), & “Sampling, Testing, Remediation and Disposal Guidelines”**

- *All samples must be collected from the flowering tops of the plant by cutting the top five to eight inches from the “main stem” (that includes the leaves and flowers), “terminal bud” (that occurs at the end of a stem), or “central cola” (cut stem that could develop into a bud) of the flowering top of the plant.*

**Department Response:** The Department has adopted a procedure for sampling and collecting floral hemp material prior to harvest, established by an annually published guidelines document entitled “*Sampling, Testing, Remediation and Disposal Guidelines*,” as prompted by the Program Rules Section 11 and A.C.A. § 2-15-509(e). The top 8 inches (or just below the floral/inflorescence material) of the cannabis plant’s main/apical stem will be sampled for THC concentration compliance testing. It is the Department’s intention to sample 100% of all lots produced under the Department Program. Licensed Growers are only permitted to begin harvesting after a Department representative has first collected Pre-Harvest compliance samples from the requested lot(s) for harvest. **See Section 11 of Program Rules, A.C.A. § 2-15-509(e), & “Sampling, Testing, Remediation and Disposal Guidelines”**

***A. Procedures to either sample all lots or do performance based sampling:***

*1. Sampling all lots [990.3 (a) (2) i-iii]:*

- *The standard sampling method must be used by all producers, except for producers operating under a State or Tribal plan that includes a performance-based sampling requirement.*

**Department Response:** The Department will utilize standard sampling protocols. It is the Department’s intention to sample and test 100% of all lots produced under the Department’s Hemp Program. **See “Sampling, Testing, Remediation and Disposal Guidelines”**

- *Every lot and every single growing location must be sampled and tested.*

**Department Response:** The Department will utilize standard sampling protocols. It is the Department’s intention to sample and test 100% of all lots produced under the Department’s Hemp Program. **See “Sampling, Testing, Remediation and Disposal Guidelines”**

***B. Procedures on sampling agents:***

- *Procedures to conduct sampling and testing within 30 days prior to the anticipated harvest date; samples must be collected by a sampling agent. Producers may not collect samples from their own growing facilities. [990.3 (a) (2) (i)]*

**Department Response:** The Department has adopted a procedure for collecting floral hemp material compliance samples prior to harvest, established by an annual guidelines document entitled “*Sampling, Testing, Remediation and Disposal Guidelines*,” as prompted by Program Rules Section 11(A) and A.C.A. § 2-15-509(e). Licensed Growers shall submit a Program document entitled “*Harvest Request Form*” to the Department no more than fifteen (15) days prior to the intended harvest date of the requested lot(s), per Section 10(B) of Program Rules. Receipt of a complete and correct *Harvest Request Form* allows the Department time to dispatch a Department representative to the licensed location for compliance sample collection prior to harvest, per Section 10(C) of Program Rules. Licensed Growers are only permitted to begin harvesting procedures after a Department representative has first conducted a site inspection and collected Pre-Harvest compliance samples from the requested lot(s) for harvest. **See Section 11(A)&(B) of Program Rules, A.C.A. § 2-15-509(e) and “Sampling, Testing, Remediation and Disposal Guidelines”**

- *Procedures for collecting samples from the flowering tops of plants which shall be approximately five to eight inches in length from the “main stem” (that includes the leaves and flowers), “terminal bud” (that occurs at the end of a stem), or “central cola” (cut stem that could develop into bud). [990.3 (a) (2) (ii)]*

**Department Response:** The Department has adopted a procedure for collecting the flowering tops of plants prior to harvest, established by an annually published guidelines document entitled “*Sampling, Testing, Remediation and Disposal Guidelines*” as prompted by Section 11(A) of Program Rules and A.C.A. § 2-15-509(e). The sample collection will be conducted by an authorized Department representative and will be done in accordance with the sampling procedures detailed within the Program guidance document “*Sampling, Testing, Remediation and Disposal Guidelines*.” The top eight (8) inches (or just below the floral/inflorescence material) of the cannabis plant’s main/apical stem will be sampled for the acceptable hemp THC level. It is the Department’s intention to sample 100% of all lots produced under the Department Program. **See Section 11(A) of Program Rules, A.C.A. § 2-15-509(e), and “Sampling, Testing, Remediation and Disposal Guidelines”**

- *Procedures to ensure the sampling method used represents a homogenous composition of the lot. [990.3 (a) (2) (iii)]*

**Department Response:** The Department has adopted a procedure for ensuring sampling methods represent a homogenous composition of the lot, established by an annually published guidelines document entitled “*Sampling, Testing, Remediation and Disposal Guidelines*” as prompted by Section 11(A) of Program Rules and A.C.A. § 2-15-509(e). **See Section 11(A) of Program Rules, A.C.A. § 2-15-509(e), and “Sampling, Testing, Remediation and Disposal Guidelines”**

- *Procedure/statement/allowance to require the producer or an authorized representative of the producer to be present at the growing site during sample collection. [990.3 (a) (2) (iv)]*

**Department Response:** The Department has adopted a procedure for collecting floral hemp material compliance samples prior to harvest, established by an annual guidelines document entitled “*Sampling, Testing, Remediation and Disposal Guidelines*,” as prompted by Program Rules Section 11(A) and A.C.A. § 2-15-509(e). Pursuant to Program Rules Section 10(D), the licensee or its authorized agent must be present during the Department’s site inspection and sample collection. **See Section 10(D) of Program Rules and “Sampling, Testing, Remediation and Disposal Guidelines”**

- *Procedures to allow for representatives of the sampling agency to have complete and unrestricted access during business hours to all hemp and other cannabis plants and all land, buildings, etc. used for cultivation, handling, and storage. [990.3 (a) (2) (v)]*

**Department Response:** Pursuant to Program Rules Section 10(E), the Arkansas Industrial Hemp Act, and the licensee’s approved and signed *Licensing Agreement*, the Department, or its agent, and any law enforcement entity are authorized to enter any licensed premises at any time, with or without cause and without advanced notice. **See Section 10(E) of Program Rules and A.C.A. § 2-15-507**

- *Procedures to ensure that a producer does not harvest any cannabis prior to samples being taken. [990.3 (a) (2) (vi)]*

**Department Response:** The Department has adopted a procedure for collecting floral hemp material compliance samples prior to harvest, established by an annual guidelines document entitled “*Sampling, Testing, Remediation and Disposal Guidelines*,” as prompted by Program Rules Section 11(A) and A.C.A. § 2-15-509(e). The Department has also adopted rules pertaining to the Licensee’s responsibilities prior to harvest in Section 10 of the Program Rules. Licensees are not permitted to harvest any hemp material prior to the Department’s collection of compliance samples per Section 10(F), (G), (J). **See Section 10 of Program Rules and “Sampling, Testing, Remediation and Disposal Guidelines”**

- *Procedures to ensure sampling agents are trained using USDA, state, or tribal training and the information is maintained by the state or tribal government. [990.3 (a) (2) (vii)]*

**Department Response:** The Department has adopted a procedure for sample collection using authorized Department representatives within the annually published guidelines document entitled “*Sampling, Testing, Remediation and Disposal Guidelines*” as prompted by Program Rules Section 11(A) and A.C.A. § 2-15-509(e). All Department Plant Industries inspectors attend an annual mandatory inspector training orientation where AR Hemp Program Rules and inspection/sampling procedures are explained in-detail to Department inspectors by the Department’s Hemp Program Staff. The Program educates and informs the Department

inspectors on proper sampling techniques and any changes or deviations to the Program's annually published "*Sampling, Testing, Remediation and Disposal Guidelines*" document. The Department monitors and documents the attendance of the inspector orientation training sessions, permitting an inspector to conduct sampling of hemp lots grown under the Department's Hemp Program. **See Section 11(A), A.C.A. § 2-15-509(e), and "*Sampling, Testing, Remediation and Disposal Guidelines*"**

**C. Procedures on testing:**

- *Provides a definition for "acceptable hemp THC level." [990.1]*

**Department Response:** Pursuant to Section 11(C) of Program Rules and A.C.A. § 2-15-509(e), the Department is permitted to establish a sampling, testing, and remediation program, published annually on the Program's website as a "*Sampling, Testing, Remediation and Disposal Guidelines*" document. This policy guidance document defines "acceptable hemp THC level" to mean, "the application of the Measurement of Uncertainty to the reported (decarboxylated) delta-9-THC concentration level on a dry weight basis to the 0.30% limit set forth in federal and state law." **See Section 11(C) of Program Rules, A.C.A. § 2-15-509(e), and "*Sampling, Testing, Remediation and Disposal Guidelines*"**

- *Procedures to require testing for delta-9 THC concentration. The procedures must require accurate identification of the acceptable hemp THC level. Testing methods must include but are not limited to: 1) Post decarboxylation or other similarly reliable method, 2) Consideration of potential conversion of delta-9 THCA into THC and test result measure total available THC (THC + THCA); 3) Use of gas or liquid chromatography with detection; 4) Procedures to determine total THC concentration on a dry weight basis. [900.3 (a) (3)]*

**Department Response:** The Department has adopted a procedure for testing hemp material for the accurate identification of the acceptable hemp THC level as established by an annual guidelines document entitled "*Sampling, Testing, Remediation and Disposal Guidelines,*" as permitted by Program Rules Section 11(C) and A.C.A. § 2-15-509(e). All official Program compliance samples are sampled directly by authorized Department inspector staff and hand-delivered by Department staff to the Department's Plant Industries Chemistry Lab for compliance testing for the acceptable hemp THC level. The Department must first inspect licensed sites and collect samples of hemp material prior to any harvesting, processing or marketing of the hemp material, as indicated in Section 11(C)(1) and Section 11(C)(5) of Program Rules. The Department's Plant Industries Chemistry Lab shall test official compliance samples for Total Delta-9-THC concentration, or decarboxylated Delta-9-THC, in accordance with the Department's annual testing guidelines document entitled "*Sampling, Testing, Remediation and Disposal Guidelines*" and Program Rules Section 11(C). The THC quantitation method utilized by the



Department's Plant Industries Chemistry Lab accounts for the potential conversion of delta-9-THC acid into delta-9-THC, using either gas chromatography or high-performance liquid chromatography, in order to effectively calculate the acceptable hemp THC level on a dry weight basis. **See Section 11(C)(1)-(6) of Program Rules, A.C.A. § 2-15-509(e), and "Sampling, Testing, Remediation and Disposal Guidelines"**

- *Procedures to ensure the hemp plant material from one lot not be commingled with hemp plant material from other lots. [990.3 (a) (3) (iii)]*

**Department Response:** The Department has adopted a procedure to ensure hemp material produced by a licensee from one lot will not be commingled with hemp material from other lots, established by an annual guidelines document entitled "*Sampling, Testing, Remediation and Disposal Guidelines*." The Program Rules also addresses the prohibition of commingling harvested hemp material in Section 10(H) and Section 11(C). Furthermore, A.C.A. § 2-15-510(c) prohibits the commingling of one hemp lot from being mixed with other hemp lots. **See Section 10(H) and Section 11(C) of Program Rules, A.C.A. § 2-15-510(c), and "Sampling, Testing, Remediation and Disposal Guidelines"**

- *Procedures to require hemp testing laboratories to adhere to standards of performance for detecting THC concentration, including Measurement of Uncertainty (MU). [990.3 (a) (3) (iii) (A through G)]*

**Department Response:** Pursuant to Section 11(C) of Program Rules and A.C.A. § 2-15-509(e), the Department is permitted to establish a sampling, testing, and remediation program, published annually on the Program's website as a "*Sampling, Testing, Remediation, and Disposal Guidelines*" document. The Department's Plant Industries Chemistry Lab participates in a nationwide hemp proficiency testing program sponsored by the University of Kentucky Regulatory Services Laboratory to ensure standards of performance for detecting THC concentration in cannabis samples. The Department Plant Industries Chemistry Lab has calculated the expression of uncertainty in measurement (MU), using the GUM calculation, derived from previous seasons' THC concentration data collected during the Department's Pilot Hemp Research Licensing Program. The Department Plant Industries Chemistry Lab's use of the MU value is only intended for the Department's official testing laboratory conducting THC analysis on official compliance samples grown under the Program and is not the official MU value for all third-party cannabis testing facilities in Arkansas. **See Section 11(C) of Program Rules, A.C.A. § 2-15-509(e), and "Sampling, Testing, Remediation and Disposal Guidelines"**

- *Requirement to only use DEA registered labs after December 31, 2022. [990.3 (a) (3) (iii) (H)]*

**Department Response:** The Department's Plant Industries Chemistry Laboratory is the only official entity authorized to conduct official compliance testing for the AR Hemp Licensing Program and is actively applying for DEA lab-registration with the DEA. The Department

anticipates no issues with obtaining this registration from the DEA and will alert the USDA of any changes or deviations from current plans in meeting this requirement prior to December 31, 2022.

- *Procedures for requiring testing laboratories to report test results to USDA for determining compliance with this part. [990.3 (a) (3) (iii) (H) (4)]*

**Department Response:** The Department's Plant Industries Chemistry Laboratory is the only official entity authorized to conduct official THC compliance testing for the AR Hemp Licensing Program, which determines whether a crop is permitted to be marketed, processed or sold. The Department has the ability to generate custom reports and will provide the information mentioned above ([990.3 (a) (3) (iii) (H) (4)]) to USDA on a reoccurring monthly schedule, or upon request, in the information sharing format deemed acceptable by USDA. The Department will report test results to the USDA as needed or prompted by the USDA.

### **3) Plan for disposal procedures.**

- *Procedures for the disposal or remediation of cannabis plants if the sample representing that plant tests above the acceptable hemp THC level. [990.3 (a) (6)]*

**Department Response:** Pursuant to Section 11(C) of Program Rules and A.C.A. § 2-15-509(e), the Department is permitted to establish a sampling, testing, and remediation program, published annually on the Program's website as a "*Sampling, Testing, Remediation and Disposal Guidelines*" document. If the Department Plant Industries Chemistry Lab issues a laboratory report from a compliance sample that indicates the acceptable THC level has been exceeded, the Department will notify the licensee that the licensee has produced cannabis that exceeds the acceptable hemp THC level concentration. As indicated in the Program's guidelines document "*Sampling, Testing, Remediation, and Disposal Guidelines*," the licensee must make the necessary arrangements within fifteen (15) days of receiving noncompliant lab results to implement a mandatory destruction of the noncompliant material, which includes the submission of a completed "*Destruction Request Form*" to the Department at least fifteen (15) days prior to disposing of any noncompliant material. Department staff will be present at all mandatory destructions of noncompliant material to witness, document, and ensure a Department-approved disposal method was implemented rendering the material non-retrievable. Department approved disposal methods mirror USDA-AMS's approved methods for disposal and are included within the Program's annually published "*Sampling, Testing, Remediation, and Disposal Guidelines*" document. Additionally, the local county Sheriff's office may be notified and invited to witness the mandatory destruction of any noncompliant cannabis materials produced in the Program. The disposal of any hemp or cannabis material is prohibited unless approval is granted in writing to the licensee by the Department, or the Department or other authorized agent is present to witness the destruction of noncompliant cannabis material. The Department

reserves the right to sample and test any destruction lots for THC concentration testing as permitted by Program Rules. **See Section 10(C) of Program Rules, A.C.A. § 2-15-509(e), and “Sampling, Testing, Remediation and Disposal Guidelines”**

- *Procedures to notify USDA of non-compliant plants and disposal of those plants from the lot where representative samples were taken. Test results must be included. [990.3 (a) (6)]*

**Department Response:** Licensees must notify the Department fifteen (15) days prior to any disposal of hemp or cannabis material using the Department form entitled, “*Destruction Request Form*,” as prompted by Program Rules Section 10(B). The Department has the software capabilities to generate custom reports that include this information and will provide those reports to USDA on recurring schedules or upon request in a manner prescribed by USDA. All lab test results from the Department Plant Industries Chemistry Lab will be included with destruction/disposal reports of noncompliant plants produced under the Program to USDA. **See Section 10(B) of Program Rules**

#### **4) Plan for remediation procedures.**

- *Procedures to ensure effective disposal or remediation of plants produced in violation of part 990; only those successfully remediated crops will be allowed to enter the stream of commerce, and all other remaining non-compliant crops must then be disposed. [990 (a) (6) (i-iii); 990 E. Disposal and Remediation of Non-Compliant Plants]*

**Department Response:** Pursuant to Section 11(C) of Program Rules and A.C.A. § 2-15-509(e), the Department is permitted to establish a sampling, testing, and remediation program, published annually on the Program’s website as a “*Sampling, Testing, Remediation and Disposal Guidelines*” document. This annually published guidelines document details permissible methods of noncompliant hemp disposal and acceptable forms of post-harvest crop remediation for the Program’s licensees to utilize. The Program’s guidelines document was drafted in consultation with the USDA-AMS’s “*Remediation and Disposal Guidelines for Hemp Growing Facilities*” published on the U.S. Domestic Hemp Production’s website. If a lot is tested above the acceptable hemp THC level under pre-harvest sampling procedures but remains below 1.00% Total THC, the Department will allow the resampling and retesting of the harvested lot only if the lot has been properly remediated by the licensee in an appropriately remediated form (i.e. the harvested lot is no longer in intact-plant form; the lot has been chopped, ground, trimmed, etc. into a homogenized lot). **See Section 11(C) of Program Rules and A.C.A. § 2-15-509(e).**

#### **5) Plan for inspection procedures.**

- *Procedure for conducting annual inspections of random sample of licensed producers to verify that hemp is not produced in violation of this part. [990.3 (a) (7)]*

**Department Response:** Pursuant to Section 8(B) & (C) of the Program Rules and A.C.A. § 2-15-507(c)(2)(i), the Department has the authority to conduct random inspections of licensees at any time, with or without cause and without advanced notice. The Department shall conduct random inspections at least annually of a random sample of licensees to ensure that hemp is being cultivated in compliance with the Program Rules and the Arkansas Hemp Production Act. All hemp lots grown in Arkansas's Hemp Licensing Program are sampled and inspected by the Department at least 15-days prior to the licensee's anticipated harvest date. The Department also conducts geospatial verification inspections at the time of the Department's sample collection and randomly throughout the calendar year. **See Section 8(B)&(C) of Program Rules and A.C.A. § 2-15-507(c)(2)(i)**

#### **6) Plan for collection information.**

- *Procedure for submitting the information described in 990.70 to the Secretary not more than 30 days after the date on which the information is received. [990.3 (a) (8)]*

**Department Response:** The Department has software capabilities to generate custom reports that include this information and will provide those reports to USDA on recurring schedules or upon request. The Department intends to comply with all reporting requirements described in 7 CFR 990.70 (revised January 19, 2021) to USDA.

- *Procedure for producers licensed under state and tribal government plans to share information with USDA, Agricultural Marketing Service (AMS), and Farm Service Agency (FSA) including: 1) hemp crop acreage; 2) reporting total acreage of hemp planted, harvested, and disposed; 3) license or authorization number; 4) street address; 5) geospatial location(s) of each lot or greenhouse where hemp will be produced; 6) acreage of greenhouse or indoor square footage dedicated to the production of hemp. [990.3 (a) (10) and 990.7]*

**Department Response:** The Department has adopted Program reporting requirements in Section 7 and Section 13 of the Program Rules. Licensees shall report the hemp crop acreage and other applicable information or data to the USDA, Agricultural Marketing Service, or Farm Service Agency in accordance with 7 CFR 990.23 (revised January 19, 2021). The information referenced above is tracked by the Department and will be reported to USDA on recurring schedules or upon request. To ensure a licensed producer shares the above information with USDA, AMS, or FSA, the Department will verify on required Program reporting documentation whether the producer has shared or reported the applicable information with the USDA, AMS, or FSA. Those producers who have not submitted the relevant information to the USDA, AMS, or FSA will be considered

to have failed to submit required Program reporting documentation, which is a violation of Program Rules. **See Section 7 and Section 13 of Program Rules**

**7) Plan to comply with enforcement procedures.**

- *Procedures to contain provisions relating to negligent producer violations as defined under this part; producers shall not receive more than one negligent violation per growing season. [990.6 (b)]*

**Department Response:** The Department has the authority to issue Corrective Action Plans as needed for any violation of the Program Rules or associated USDA hemp production program rules. The Program Rules summarize prohibited acts in Section 17. The Department will not issue more than one negligent violation per growing season to a licensed producer in accordance with this requirement. **See Section 17 of Program Rules**

- *Provides for corrective action plan for negligent violations: 1) failure to provide legal description of land; 2) failure to obtain a license; 3) produces cannabis with THC exceeding 1.0 percent. [990.6 (b)]*

**Department Response:** The Department has the authority to issue Corrective Action Plans as needed for any violation of the Program Rules. An applicant will not be approved for licensure with the Department without a legal land description provided within a submitted application. Hemp producers that fail to obtain a license in Arkansas will be reported to state law enforcement, which may result in seizure of contraband cannabis materials. The Department has adopted a procedure for disposal of noncompliant hemp material, established by an annual guidelines document entitled “*Sampling, Testing, Remediation and Disposal Guidelines*” as permitted by Section 10(C). All issued Corrective Action Plans will comply with Program Rules and the annually published sampling and testing guidelines documents. **See Section 10(C) of Program Rules and Program Guidelines Document entitled “Sampling, Testing, Remediation and Disposal Guidelines”**

- *Procedures to provide for the correction of negligent violations: 1) a reasonable date to correct the violation; 2) reporting requirements for 2 years from date of the negligent violation; 3) violations are not subject to federal, state, tribal, or local government criminal enforcement action; 4) provides that a negligent violation 3 times within a 5-year period is ineligible to produce hemp for a period of 5 years from the date of the 3rd violation; 5) state or tribal government shall conduct inspections to determine if corrective action plan has been implemented. [990.6 (c)]*

**Department Response:** The Department has the authority to issue Corrective Action Plans as needed for any violation of the Program Rules. As established by annual Program Policy guidelines, Corrective Action Plans will include: 1) a reasonable date to correct the violation, 2) reporting requirements for two (2) years from date of the negligent violations, 3) will not

subject the licensee to criminal enforcement action, 4) prevent licensure for up to five (5) years if a negligent violation occurs three (3) times within a five (5) year period, and 5) include inspections to determine if the corrective action plan has been properly implemented. Corrective Action Plans issued by the Department conform to Program Rules and the AR Hemp Production Act and will be appropriate to the specific violation.

- *Procedures for producer violations made with a culpable mental state greater than negligence: Producer shall be reported to the U.S. Attorney General and the chief law enforcement officer of the state or tribal government. [990.6 (d)]*

**Department Response:** The Department will report to the U.S. Attorney General and the Arkansas Chief Law Enforcement Officer if a licensed producer that commits violations made with a culpable mental state greater than negligence. This procedure will be implemented as soon as information is received and confirmed by the Department.

- *Procedures for addressing felonies: 1) provides for a 10-year ineligibility restriction for persons with a State or Felony conviction relating to a controlled substance; 2) provides for controlled substance felony conviction exception for participants in state hemp pilot program authorized under the 2014 Agricultural Act after December 2018; 3) procedures for business entities to determine which participants are considered to be “key” or have executive managerial control. [990.6 (e)]*

**Department Response:** The Department Program Rules addresses felony conviction ineligibility in Section 2(A)(9) and Section 2(C). A person who was lawfully producing hemp under the state plan authorized under the 2014 Farm Bill and who had been convicted of a felony relating to a controlled substance will not be prohibited from participating in a state plan pursuant to the 2018 Farm Bill. Procedures for business entities to determine which participants are considered “key” will be determined within the Department’s application for licensure and will be verified with the Arkansas Secretary of State’s Office. All key participants will be required to submit annual state and federal criminal history background checks to the Department prior to licensure or licensure renewal. **See Section 2(A)(9) and Section 2(C) of Program Rules**

- *Procedures stating that any persons who materially falsify any information in their application shall be deemed ineligible to participate in the program. [990.6 (f)]*

**Department Response:** The Department has established language within the Program Rules that accounts for any person providing false, misleading, or incorrect information to the Department, which includes information provided within an application and any subsequent Program report or request form. **See Section 17(M) of Program Rules**

***8) Certification that the state or tribal government (whichever applicable) has resources and personnel to carry out required Farm Bill practices and procedures. [990.3 (a) (9)]***

**Department Response:** The Department has provided a certifying statement from the Secretary of Agriculture included within this hemp production plan submission document.

***9) Plan may include other practices or procedures as long as consistent with this part and the Act. Plan may include requirements more stringent than this part or the Act. [990.3 (a) (10) (b) (1) and (2)]***

**Department Response:** The Department will administer the Program as established by the Arkansas Hemp Production Act as amended to the extent that the Act and related Program Rules are consistent with and not less stringent than the 2018 Farm Bill. **See A.C.A. § 2-15-501 et seq.**

**License Numbering Schemes for State and Tribal Hemp Production Plans:**

***States must use the following format when assigning license or authorization numbers:  
[ANSI/FIPS State Code\_State License #]***

**Department Response:** Arkansas will issue licenses using the following format:  
**05\_H1, 05\_H2, 05\_H3, 05\_H4, etc.**



Asa Hutchinson  
Governor

# ARKANSAS DEPARTMENT OF AGRICULTURE

1 Natural Resources Drive, Little Rock, AR 72205  
agriculture.arkansas.gov  
(501) 225-1598



Wes Ward  
Secretary of Agriculture

November 2, 2021

The Honorable Thomas J. Vilsack  
Secretary of Agriculture  
U.S. Department of Agriculture  
1400 Independence Ave., S.W.  
Washington, DC 20250

Dear Secretary Vilsack:

I am writing in regard to the proposed state implementation plan for the enforcement of federal hemp laws by the Arkansas Department of Agriculture. Pursuant to Section 297B(a)(2)(A)(vii) of the Agricultural Improvement Act of 2018, I certify that the state of Arkansas has the resources and personnel necessary to carry out each of the practices and procedures identified in Section 297B(a)(2) of the Act. The Arkansas Department of Agriculture has approved program fees to support and implement the program, as permitted by A.C.A. § 19-6-301, A.C.A. § 2-15-505(d) and A.C.A. § 2-15-507(h).

Respectfully,

Wesley W. Ward  
Secretary of Agriculture  
State of Arkansas





# ARKANSAS DEPARTMENT OF AGRICULTURE

## PLANT INDUSTRIES DIVISION

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### Sampling, Testing, Remediation & Disposal Guidelines

#### Arkansas Hemp Program– 2022 Season

Publication Date: **11/2/2021**

#### **I. Introduction & Purpose**

Federal and state law charge the Arkansas Department of Agriculture (“Department”) with responsibility for managing Arkansas’s Hemp Program (“Program”). In 2014, Congress enacted legislation permitting state departments of agriculture to conduct research pilot programs with industrial hemp. Congress specifically limited its authorization of state-level industrial hemp research pilot programs as defined in 7 U.S.C. § 5940 (2014 Farm Bill). The 2018 Farm Bill (P.L. § 115-334) removes hemp from the list of controlled substances and delegates the regulatory authority to the state departments of agriculture through a USDA-approved state plan. As required by the Arkansas Hemp Production Act (A.C.A. § 2-15-501 *et seq.*), the Department intends to receive federal approval from the USDA-AMS U.S. Domestic Hemp Production Program to continue regulating hemp production in Arkansas under the 2018 Farm Bill authority for the 2022 season.

To that end, the Arkansas Hemp Program conducts a sampling, testing, remediation and disposal program to confirm and ensure compliance with state and federal law, as permitted by A.C.A. § 2-15-509(e). A.C.A. § 2-15-503(5) defines industrial hemp as “the plant *Cannabis sativa* and any part of the plant, including the seeds of the plant and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, whether growing or not, that contains a tetrahydrocannabinol concentration of no more than that adopted by federal law under the Agricultural Marketing Act, 7 U.S.C. § 1639o, as it existed on January 1, 2021.”

A.C.A. § 2-15-509(e) directs the Department to establish a sampling, testing, remediation and disposal program that will ensure that THC levels in industrial hemp produced by the Department’s license holders do not exceed the 0.3% delta-9-THC threshold set by Congress. The Department intends to inspect and sample 100% of hemp plots grown under the Arkansas Hemp Program. All varieties will be tested for compliance with the acceptable hemp THC level threshold set by Congress.

#### **II. Definitions**

- 1) “**Acceptable Hemp THC Level**” means the application of the Measurement of Uncertainty to the reported (decarboxylated) delta-9-THC concentration level on a dry weight basis to the 0.30% limit set forth in federal and state law.
- 2) “**Cannabis**” means the plant that, depending on its THC concentration level, is defined as either “hemp” or “marijuana.” Cannabis is a genus of flowering plants in the family Cannabaceae of which *Cannabis sativa* is a species, and *Cannabis indica* and *Cannabis ruderalis* are subspecies thereof. Cannabis includes all parts of the plant, whether growing or not, including its seeds, resin, compounds, salts, derivatives, and extracts; and does not include a “publicly marketable hemp product,” as defined by Program Rules.
- 3) “**Decarboxylated**” means the completion of the chemical reaction that converts THC-acid into delta-9-THC, the intoxicating component of cannabis. The decarboxylated value is also calculated using a conversion formula that sums delta-9-THC and eighty-seven and seven tenths (87.7) percent of THC-acid.
- 4) “**delta-9-THC**” means delta-9-tetrahydrocannabinol concentration (the primary intoxicating component of cannabis). For compliance purposes, all delta-9-THC concentrations must be measured post-



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decarboxylation or by another method which shall include both delta-9-THC and delta-9-THCA (also known as Total THC).

- 5) **“Department”** means the Arkansas Department of Agriculture.
- 6) **“Disposal”** or **“destruction”** means an activity that transitions the noncompliant material or product into a non-retrievable or non-ingestible form. Such activities include plowing, tilling, or disking plant material into the soil; mulching, composting, chopping, or bush mowing plant material into green manure; burning plant material; burying plant material into the earth and covering with soil.
- 7) **“Handle”** means to harvest or store hemp plants or hemp plant parts prior to the delivery of such plants or plant parts for further processing. **“Handle”** also includes the disposal of such plants.
- 8) **“Harvest”** means the process of collecting plants or any part of plants, including but not limited to viable seeds, flowers, cuttings for propagation, etc.
- 9) **“Industrial Hemp”** shall be used interchangeably with **“Hemp”** and have the same meaning. Hemp means *Cannabis sativa L.* and any part of that plant, including the seeds thereof and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salt of isomers, whether growing or not, with a delta-9-tetrahydrocannabinol concentration of not more than 0.3 percent on a dry weight basis, as defined in the Agricultural Improvement Act of 2018, 21 U.S.C. & 801 et seq. as it currently exists or as it may be subsequently amended.
- 10) **“Inspector”** means an employee or other representative of the Department sent to collect samples and perform inspections.
- 11) **“Location ID”** means the unique identifier name established by the applicant or licensee for each unique set of GPS coordinates where industrial hemp will be grown, handled, stored, or processed, which may include a field name or building name.
- 12) **“Lot”** means a contiguous area in a field, greenhouse, or indoor growing structure containing the same variety or strain of hemp throughout the area.
- 13) **“Measurement of Uncertainty”** means the parameter, associated with the result of a measurement that characterizes the dispersion of the values that could reasonably be attributed to the particular quantity subject to the measurement.
- 14) **“Post-Harvest Sample”** means a sample taken from the harvested industrial hemp material from a particular lot’s harvest in accordance with these procedures developed under the program rules; the entire lot’s harvest must be in the same form (for example: flowers, chopped materials, ground materials, trimmed materials, removed floral and leaf materials, etc.), homogenous, and not mixed with non-hemp materials or hemp from another lot.
- 15) **“Pre-Harvest Sample”** means a composite, representative portion from plants in a hemp lot collected prior to harvest in accordance with these procedures developed under the program rules.
- 16) **“Program”** means the Arkansas Industrial Hemp Research Pilot Program as established by the Arkansas Hemp Production Act, A.C.A. 2-15-501 et seq. and associated program rules.
- 17) **“Prohibited Variety”** means a variety or strain of cannabis excluded from the Department’s Industrial Hemp Research Program.
- 18) **“Remediation”** refers to the process of rendering noncompliant cannabis, compliant. Remediation can occur by removing and destroying flower material, while retaining stalk, stems, leaf material, and seeds. Remediation can also occur by shredding the entire plant into a biomass like material, then re-testing the shredded biomass material for compliance via the Post-Harvest Sampling Procedures detailed within these procedures developed in accordance with program rules.



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- 19) “**Variety of Concern**” means any variety of hemp in the program that tests above 0.3% total delta-9-THC in one (1) or more pre-harvest samples from diverse locations and production conditions. A hemp variety designated as a “Variety of Concern” may be subject to restrictions and additional testing.

### III. Scope

Pre-Harvest Samples and properly remediated Post-Harvest Samples collected by Department inspectors are acceptable for submission to the Department’s Laboratory Services Division for testing for the acceptable hemp THC level. All sampled hemp lots are hand-delivered to the Department’s Laboratory Services Division from an authorized Department inspector or representative. All representative compliance samples for the acceptable hemp THC level testing become property of the Department and are non-returnable. The Department reserves the right to test all hemp and other cannabis crops produced by any License Holder for THC compliance. The Department intends to inspect, sample, and test 100% of all hemp and other cannabis plots to be produced under the Program. **The Department is the only entity authorized to collect official compliance samples and conduct official compliance THC testing for all hemp lots produced under the Department’s Hemp Licensing Program. Third-party laboratories are NOT permitted at this time to conduct official THC testing to determine whether or not a lot is permitted to be marketed or sold. Licensed producers, however, are encouraged to monitor THC levels once their crop begins to mature or flower by utilizing a licensed third-party laboratory.**

**This guidance document is for informational purposes only and does not have the force and effect of law. Nothing in this guidance document should be construed as rulemaking, nor should it be construed as seeking to supersede existing law.**

### IV. Equipment & Supplies for Department Inspector

The Department inspector shall use the following equipment and supplies, provided to the inspector by the Program:

- 1) Garden pruners/shears
- 2) Rubbing alcohol disposable wipes
- 3) Paper sample bags
  - a. The standard paper bags for sample collection are ‘heavy duty’ evidence bags and can withstand up to 12 pounds of plant material.
  - b. If a lot to be sampled cannot fit inside the standard paper bag, a larger paper bag provided by the Department’s Plant Industries Chemistry Lab will be utilized, as determined on a case-by-case basis.
- 4) Heavy-duty stapler with extra staples
- 5) Security tape
- 6) Permanent markers and Ink pens
- 7) Inspection Paperwork
  - a. Licensee and Location Information
  - b. Sampling lot(s) information
  - c. Sample Forms with Chain of Custody



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- d. Location IDs aerial map
  - e. GPS verification form
  - f. Planting Report(s)
  - g. Any other relevant documentation associated with inspection
- 8) Department issued cell phone or handheld GPS unit to verify GPS coordinates/Location IDs
  - 9) Nitrile disposable gloves or sterilized scoop
  - 10) 5-Gallon Bucket(s) with lid for transport
  - 11) Metric rulers with 8 inches/20 centimeters marked for plant cuttings

### V. Harvest Sampling Procedures

#### a) **Grower Responsibilities prior to Harvesting any Lot**

- 1) No hemp plant or hemp plant parts shall be harvested from any lot before a Department inspector completes an inspection and sample-collection visit.
- 2) The Grower shall submit a completed "**Harvest Request Form**" via e-mail communication to [industrialhemp@agriculture.arkansas.gov](mailto:industrialhemp@agriculture.arkansas.gov) at least fifteen (15) days in advance of the expected harvest date. If no harvest will take place from a planted lot, a "**Destruction Request Form**" must be submitted to the Department at least fifteen (15) days in advance of the expected disposal date. Every lot planted by a license holder must have either a **Harvest Request Form** or **Destruction Request Form** submitted to the Department.
- 3) Receipt of a **Harvest Request Form** triggers a site inspection and sample collection by a Department Inspector.
- 4) Department inspectors shall contact the grower to confirm the harvest lot location and to schedule a specific time on a date that is not later than the grower's expected harvest date.
- 5) The licensee or the grower's designated responsible party shall accompany the Department inspector throughout the inspection and sampling process.
- 6) The inspector shall be provided with complete and unrestricted access to all industrial hemp plants, whether harvested or not, all land, buildings or other structures used for the cultivation, handling and storage of industrial hemp plants or plant parts, and all locations listed in the Hemp Grower License.
- 7) The grower shall complete the harvest of the crop from a lot not more than fifteen (15) days following the date of the inspection and sample-collection visit, unless specifically authorized in writing by the Department; provided, however, that such authorization shall not exceed an additional five (5) days and shall not be granted by the Department without its determination that the cause of delay was inclement weather or another circumstance beyond the licensed grower's control.
- 8) If a licensed grower fails to complete the harvest of the crop from a lot within fifteen (15) days following the date of sample collection, then the licensed grower shall submit a new **Harvest Request Form** and may be required to pay additional sampling fees established by Program Rules.
- 9) Harvested materials shall not be comingled with other harvest lots without express permission from the Department.
- 10) Harvested material shall not be removed from the Licensed Grower or Processor/Handler's property, nor comingled, nor extracted, until the Department releases the material based on a satisfactory laboratory report indicating acceptable hemp THC levels from the Department's Laboratory Services



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Division. The Department's Laboratory Services Division is currently the only lab authorized to conduct official program THC compliance testing.

- 11) Once samples are received by the Department's Laboratory Services Division, the Program will issue a "Sample Invoice" **via e-mail communication** to the license holder within 30-days of sample collection. The number of pre-harvest and post-harvest samples requested by the licensed grower and collected by the Department determines the sampling fees due to the Program.
- 12) The licensed grower shall pay the "Sample Invoice" within thirty (30) days of the Program issuing an invoice via e-mail. If a licensed grower fails to pay the Sampling Invoice in full within thirty (30) days of e-mail receipt, the Department may refer the license holder to the Department's debt collection agency after given notice in-writing.
- 13) The Department shall notify the grower of lab test results from the Department's Laboratory Services Division as soon as reasonably practical. Lab results shall be reported to the license holder **via e-mail communication**.
  - a) **NOTE:** The Department shall make every effort to return an analysis within thirty (30) days of sample receipt, however, turnaround times will be affected by Program and laboratory staff workload. Lab results shall be sent to the Grower's business email on-file. It is the Grower's responsibility to make sure this e-mail is monitored, valid and current, as originally agreed upon within the signed *Terms & Conditions* of the Program's Application. **Waiting for the Department's lab analysis report is NOT a valid reason to delay harvest beyond fifteen (15) days following the Department's date of inspection and sample-collection visit.**

### b) Verification of Licensed GPS Coordinates by Department Inspector

- 1) The Department inspector shall verify the GPS Coordinates and Location IDs of the production area(s) as compared with the GPS coordinates and Location ID information provided by the licensee within an approved application or Site Modification Request Form.
- 2) The Department inspector shall verify that proper field plot signage is posted on all Field Location IDs, as prompted by Section 3(F) of the Program Rules.
- 3) The Department inspector shall look for evidence that hemp plants or other cannabis plants were harvested without authorization prior to the inspector's inspection and sample-collection visit.
- 4) During the inspection, the Department inspector shall notify Hemp Program Staff of any discrepancies associated with Location IDs where hemp is produced, handled, and/or stored. The Department inspector will record updated GPS Coordinates for a specific Location ID on the *GPS Verification Form*.

### c) Pre-Harvest Sampling Procedure to be conducted by Department Inspector

- 1) The Program will e-mail the Department inspector the harvest inspection paperwork associated with the **Harvest Request Form** submitted by the licensed grower.
- 2) No earlier than fifteen (15) days prior to the grower's expected harvest date, a Department inspector will collect a representative sample from the lot to be harvested.
- 3) The Department inspector shall assemble all necessary forms, Personal Protective Equipment (PPE), supplies and sampling equipment. Make sure sampling equipment is clean, dry, and in good working condition.



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- 4) The Department inspector shall identify the lot to be harvested and estimate average plant height, appearance, approximate density, condition of the plants, and degree of maturity of the flowering material, and document these observations within the Department's harvest inspection paperwork.
- 5) The inspector shall visually establish the homogeneity of the lot to be harvested in order to establish that the growing area is of like variety. The inspector shall note any oddities or anomalies.
- 6) The material selected for Pre-Harvest Sampling will be determined by the Department inspector, not the grower. Cuttings will be collected to make one representative sample of the harvest lot.
- 7) The Department inspector will identify the lot of hemp to be sampled and label a paper bag with the following information:
  - a) **Licensee Name & License Number**
  - b) **The statement: "Pre-Harvest Sample"**
  - c) **Sample ID number**
    - i. The Sample ID number shall include the licensee's license number, Date (YYYYMMDD), and a two-digit sequential sample number assigned by the Department inspector.  
**Example:** License# H00, Sample Date October 1, 2020, Sample 02  
**Translates to:** Sample ID#: H00-20201001-02
  - d) **Lot Information**
    - i. Location ID name
    - ii. Variety name
    - iii. Representative Lot Size in Acres (outdoors) or Square Feet (indoors)
- 8) First divide the lot into four (4) equal quadrants. Refer to **Figure 2 (Page 15 of these procedures)**.
- 9) Refer to **Tables 3A & 3B (Page 17 of these procedures)** for the total number of clippings required from each lot, dependent on lot acreage size of the growing area. The total number of clippings from each harvest lot must be taken evenly among the four quadrants.
- 10) If the total number of clippings cannot be evenly divided by four, the remainder may be taken from anywhere in the lot.
- 11) The Department inspector may use appropriate discretion in determining whether more or less than the specified number of cuttings determined by **Tables 3A & 3B (Page 17 of these procedures)** should be taken from a lot.
- 12) Each plant clipping must be eight (8) inches (or 20 centimeters) long and must be taken from the plant's primary/apical stem, including floral material. This is usually the tallest, most prominent part of the plant. Do not remove any stalks, stems, flowers, seeds, or leaves from the clipping. Refer to **Figure 1 (Page 15 of these procedures)**.
- 13) Place the plant clippings collected from the lot into the properly labeled paper bag. This is the representative sample.
- 14) Seal the paper bag shut by folding over the top twice and by using the heavy-duty stapler or security tape.
- 15) Use single use/disposable equipment or thoroughly clean sampling equipment and change disposable gloves after taking each representative sample collection from each lot.
- 16) A separate representative sample must be taken from each non-contiguous lot of a given variety.
- 17) A separate representative sample must be taken from each variety.
- 18) Representative sample(s) may be placed within provided 5-gallon bucket with locking lid during transport back to the Department.



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- 19) Representative sample(s) shall be delivered to the Department's Laboratory Services Division the same day as sample collection or within one (1) business day. Keep the sample dry and warm to avoid degradation of the plant material. The Department's Laboratory Services Division will not accept damaged, torn, or unlabeled paper bags. Representative samples that do not have a completed Sample Form with Chain of Custody will not be accepted.

### **d) Post-Harvest Sampling Procedure of Remediated Material by Department Inspector**

- 1) The Program will e-mail the Department inspector the harvest inspection paperwork associated with the **Harvest Request Form** received from the licensed grower.
- 2) The Department inspector shall assemble all necessary forms, Personal Protective Equipment (PPE), supplies and sampling equipment. Make sure sampling equipment is clean, dry, and in good working condition.
- 3) The lot selected for Post-Harvest resampling shall be designated by the Pre-Harvest Sample lab results. The material selected for Post-Harvest Sampling from this lot will be determined by the Department, not the grower. All Post-Harvest Samples of floral material shall be taken from the designated harvested lot materials in the remediated form in which the material will be sent to the processor.

**Proper remediation includes either: 1) shredding the entire lot into a homogenized "biomass," or 2) separation and removal of all flowers, buds, trichomes, "trim" and "kief" from the stalks, leaves, and seeds of the lot.**

A Department inspector must inventory the entire harvest lot to determine the remediated form in which it exists and follow the protocol as appropriate in parts 6) and 7) below.

If, upon inventory, the Department inspector determines that the entire harvest lot is not in an homogenized, shredded, or otherwise properly remediated form, the Department inspector shall notify the Department's Hemp Program Manager. A license holder who refuses to complete post-harvest remediation preparations waives the right to a post-harvest retest and the pre-harvest test results shall stand, and the lot materials shall be ordered destroyed by the Department.

- 4) Identify lot of hemp to be sampled within the storage or drying area and label paper bag with the following information:
  - a) **Licensee Name & License Number**
  - b) **The statement: "Post-harvest Sample"**
  - c) **Sample ID number**
  - d) **Lot Information**
    - i. Location ID
    - ii. Variety Name
    - iii. Representative Lot Size in Acres (outdoors) or Square Feet (indoors)
- 5) For chopped, ground, shredded or otherwise homogenized biomass post-harvest samples, go to **part 6)** of these procedures. For post-harvested hemp material in other remediated forms (floral material separated and removed from stalks, leaves, and seeds, etc.), go to **part 7)** of these procedures.

**(Continued on Next Page)**



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- 6) **Post-Harvest Sampling for Chopped, Ground, Shredded or Homogenized Biomass:**
- a) Ensure the entire harvest is accounted for and in the same homogenized form (i.e., all harvested material, whether whole plant or floral material only, must be shredded with no intact plants or whole flowers remaining from that harvest).
  - b) Divide the harvested lot evenly into four (4) quadrants. A representative sample would consist of a specified number of draws from non-adjacent areas. The total number of draws is determined by **Tables 3A & 3B (Page 17 of these procedures)**, dependent on the total lot size. Each draw should consist of a handful or sterile scoop of biomass (approximately one cup by volume). The draws should be taken evenly from each equal quadrant. Refer to **Figure 2 (Page 15 of these procedures)**.
    - i. **Note:** Draws should not just be from the top of bulk containers, depths should vary. Utilize Tyvek or similar disposable sleeves if reaching deep into container.
    - ii. **Note:** Take care not to spill or drop portions of the sample. If spillage does occur return all spillage to the container being sampled – do not include spillage into the sample itself.
    - iii. **Note:** The Department inspector may use appropriate discretion in determining whether more or less than the specified number of draws should be taken from a lot.
  - c) Place draws into properly labeled paper bag. This is the representative sample.
  - d) Seal the paper bag shut using the heavy-duty stapler or security tape.
  - e) Use single use/disposable equipment or thoroughly clean sampling equipment and change disposable gloves after taking each representative sample collection.
  - f) Representative sample(s) may be placed within provided 5-gallon bucket with locking lid during transport back to the Department.
  - g) Representative sample(s) shall be delivered to the Department's Laboratory Services Division the same day as sample collection or within one business day. Keep the sample dry and warm to avoid degradation of the plant material. The Department's Laboratory Services Division will not accept damaged, torn, or unlabeled paper bags. Representative samples that do not have a completed Sample Form with Chain of Custody will not be accepted.
- 7) **For Post-Harvest Sampling for Remediated Lots that have had floral material separated and removed (e.g., stalks and seeds only, leaves and seeds only, etc.):**
- a) Ensure that the entire remediated lot is accounted for and in the same homogenized form (i.e., all harvested material must be uniform; no intact-plants or whole flowers remaining from that harvest).
  - b) Separated noncompliant floral material must be quarantined and labeled from the rest of the lot. Licensee must file an associated ***Destruction Request Form*** to dispose of the noncompliant flowers from the lot if this Post-Harvest Resampling remediation method is selected by the grower. If remediated seed is retained from the noncompliant lot, the seed is unable to be used for propagative purposes.
  - c) Divide the harvested lot evenly into four (4) quadrants. A representative sample would consist of a specified number of draws from non-adjacent areas. The total number of draws is determined by **Tables 3A & 3B (Page 17 of these procedures)**, dependent on the total lot size. Each draw should consist of a handful or sterile scoop of biomass (approximately one cup by volume). The





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draws should be taken evenly from each quadrant. Refer to **Figure 2 (Page 15 of these procedures)**.

- i. **Note:** Draws should not just be from the top of bulk containers, depths should vary. Utilize Tyvek or similar disposable sleeves if reaching deep into container.
- ii. **Note:** Take care not to spill or drop portions of the sample. If spillage does occur return all spillage to the container being sampled – do not include spillage into the sample itself.
- iii. **Note:** The Department inspector may use appropriate discretion in determining whether more or less than the specified number of draws should be taken from a lot.
- d) Place draws into properly labeled paper bag. This is the representative sample.
- e) Seal the paper bag shut using the heavy-duty stapler or security tape.
- f) Use single use/disposable equipment or thoroughly clean sampling equipment and change disposable gloves after taking each representative sample collection.
- g) Representative sample(s) may be placed within provided 5-gallon bucket with locking lid during transport back to the Department.
- h) Representative sample(s) shall be delivered to the Department’s Laboratory Services Division the same day as sample collection or within one business day. Keep the sample dry and warm to avoid degradation of the plant material. The Department’s Laboratory Services Division will not accept damaged, torn, or unlabeled paper bags. Representative samples that do not have a completed Sample Form with Chain of Custody will not be accepted.

### VI. **THC Testing Procedure**

- 1) Testing for the acceptable Hemp THC level shall be completed by the Department’s Laboratory Services Division. **The Department is currently the only entity authorized to conduct the official THC compliance testing for the acceptable Hemp THC level for all lots produced in the Arkansas Hemp Program.**
- 2) Quantitative determination of Total delta-9-THC levels will be measured using High-Performance Liquid Chromatography with ultraviolet detection (HPLC-UV) as the primary regulatory lab method. The Department reserves the right to conduct Total THC level testing using similar quantitative laboratory instruments and methods, including but not limited to the use of gas chromatography with mass spectrometry detection (GC-MS), gas chromatography with flame ionization detection (GC-FID), or both.
- 3) The Program shall issue the licensee a “Sample Invoice” **via e-mail communications** detailing the applicable program sampling fee(s) associated with the total number of pre-harvest or post-harvest samples collected by the Department at the time of inspection and sample-collection.
- 4) The issued Sampling Invoice shall be paid in full by the licensee and post-mailed to the Department within thirty (30) days of issuance. Total payment **MUST** accompany the Sampling Invoice within the mailing envelope. Post-mail total payment **and** Sampling Invoice to 1 Natural Resources Drive, Little Rock, AR 72205 ATTN: Hemp Program.
- 5) If a licensed grower fails to pay the Sampling Invoice in full within thirty (30) days, the Department may refer the license holder to the Department’s debt collection agency after given notice in-writing.
- 6) Test results shall be reported by the Program to license holders as soon as reasonably practical **via e-mail communications**. Program Staff shall make every effort to report test results within thirty (30) days of sample receipt, however, turnaround times will be affected by Program workload and laboratory sample load. Lab results shall be sent to the Licensed Grower’s business email on-file. It is the Licensed Grower’s



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responsibility to make sure this e-mail is monitored, valid and current, as originally agreed upon with then the Program's *Terms & Conditions*.

- 7) Test results and disposal of noncompliant plant lots may be reported to the USDA or state/federal law enforcement entities.

### VII. Post-Testing Actions

The total delta-9-THC content for hemp produced in Arkansas shall not exceed the acceptable Hemp THC level established within these procedures in accordance with state and federal law. In the interest of furthering research efforts and in recognition of variances due to growing conditions, weather, and varieties, the Department shall report the details of the test results to at least two decimal places where reasonably practical.

**Table 1 (Page 10 of these procedures)** provides a summary of the post-testing actions detailed in the following numbered points in this Section. **Table 1 (Page 10 of these procedures)** accounts for the Department's Laboratory Services Division's calculated "Measurement of Uncertainty" (MU) value.

Once lab results are received from the Department, please refer to **Table 1 (Page 10 of these procedures)** to determine whether the tested lot material is considered compliant or noncompliant by the Department.

**Please note that the calculated MU value is intended only for the Department's Laboratory Services Division and is not the MU value for ALL laboratories in Arkansas conducting THC analysis on cannabis material. Private third-party laboratories will be required to calculate their own individual lab's MU value. Calculated MU values must be represented on certificates of analysis next to the Total THC% value.**

The Department Laboratory Services Division's calculated MU for the 2022 season is a fixed value of:

$$\pm 0.06\% \text{ THC}$$

All issued Certificates of Analysis from the Department will have the fixed MU value reflected next to the reported Total THC percentage. The Program's application of the fixed MU value to the reported Total THC% value is known as the "acceptable hemp THC level."

<b>Pre-Harvest Test Results</b>	<b>Material allowed to market; acceptable Hemp THC level</b>	<b>Material not allowed to move -- triggers remediated Post-Harvest Sampling and testing or verification of leaf and floral destruction</b>	<b>Material Ordered Destroyed</b>
	≤ 0.36% Total THC	≥ 0.37% — 0.99% Total THC	≥ 1.00% Total THC
<b>Post-Harvest Test Results (Remediated)</b>	<b>Material allowed to market; acceptable Hemp THC level</b>		<b>Material Ordered Destroyed</b>
	≤ 0.36% Total THC		≥ 0.37% Total THC

NOTE: Calculated measurement of uncertainty value is derived from the "Guide to Expression of Uncertainty in Measurement (GUM)" (JCGM 100:2008, *Evaluation of Measurement Data*.)

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- 1) **Pre-Harvest Test Results of less than or equal to 0.3% (Total) delta-9-THC:**
  - a. The Program will report results to the licensed grower via e-mail as soon as reasonably practicable.
  - b. The Department designates the material as compliant; the lot is at the acceptable Hemp THC level and material is authorized for use or distribution in a manner consistent with the Program Rules. To that end, the Program Rules and the Arkansas Hemp Production Act do not allow the sale of leaf and/or floral material in any form to unlicensed entities, including the public consumer, wholesale distributors, retail shops, etc.
  - c. Material allowed to market to licensed Hemp Growers or licensed Hemp Processor/Handlers that are licensed with either 1) a state's department of agriculture, 2) USDA-AMS's Hemp Production Program, or 3) a USDA-approved Hemp Production Program.
  
- 2) **Pre-Harvest Test Results of greater than or equal to 0.37%, but less than 0.99% (Total) delta-9-THC:**
  - a. The Program will report results to the licensed grower via e-mail as soon as reasonably practicable.
  - b. The Department designates the material as noncompliant.
  - c. The Department may report noncompliant results to the USDA and applicable state or federal law enforcement agencies.
  - d. The License Holder shall not transfer the harvested lot from the registered growing, storage/drying, or processing site. The noncompliant lot in question must remain labeled and segregated from other harvested hemp lots until released in writing by the Department.
  - e. License Holder is permitted to complete harvest activities, which may include drying, chopping, or grinding, or other remediating processes to homogenize biomass, in preparation for transfer to a processor or storage location.
  - f. Within fifteen (15) days of e-mail receipt notice of a measured THC concentration exceeding the acceptable hemp THC level, a licensed grower shall decide between either: **(1) a post-harvest resample/retest of remediated material OR (2) complete destruction of all leaf and floral material.** License Holder must complete all harvest activities, which may include drying, chopping, grinding, or other remediating processes of the entire harvest before the material is eligible for post-harvest sample collection by the Department.
  - g. If the License Holder wishes to dispose of the entire lot with no Post-Harvest retest, a **"Destruction Request Form"** shall be submitted to the Department via e-mail communication to [industrialhemp@agriculture.arkansas.gov](mailto:industrialhemp@agriculture.arkansas.gov). If the License Holder wishes to opt for a Post-Harvest retest of remediated hemp material, an additional **"Harvest Request Form"** shall be submitted to the Department via e-mail communication to [industrialhemp@agriculture.arkansas.gov](mailto:industrialhemp@agriculture.arkansas.gov), indicating "Post-Harvest Resample" in question 1. The street address in Question 2 of the **Harvest Request Form** shall match the actual street address location where the noncompliant lot is presently stored, pending resampling and retesting by the Department.
  - h. If harvesting only grain, seed or fiber from the lot, the Department shall verify the complete destruction of all leaf and floral material from the lot in accordance with remediation procedures detailed in this document. The grain or seed must be processed and cannot remain as a viable seed for planting. Bare stalk for fiber that is free of leaf, seed, or floral material is eligible for processing.



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- i. The hemp variety in question may become designated as a Variety of Concern and the Department may run additional tests on the samples collected from other lots of this variety.
- j. If more than 50% of Pre-Harvest Samples' test results for a given Variety of Concern are above 0.30%, then the variety may be designated as a Prohibited Variety and excluded from the program.
- k. If a variety is designated as a Prohibited Variety in the program, all material, including viable seed, live plants, stock plants, and all germplasm, shall be destroyed in the presence of a Department representative, law enforcement, or both.

### 3) **Pre-Harvest Test Results equal to or greater than 1.00% (Total) delta-9-THC:**

- a. The Program will report results to the licensed grower via e-mail as soon as reasonably practicable.
- b. The Department designates the material as noncompliant and ordered mandatorily destroyed.
- c. The Department may report noncompliant results to the USDA and applicable state or federal law enforcement agencies.
- d. The License Holder shall not transfer the harvested lot from the registered growing, storage/drying, or processing site. The noncompliant lot in question must remain segregated and labeled from other harvested hemp lots.
- e. The License Holder shall mandatorily dispose of the entire harvested lot without compensation and any unharvested crop of this variety from the lot. Within fifteen (15) days of receiving notice of a measured THC concentration exceeding the acceptable hemp THC level, a License Holder shall file a "***Destruction Request Form***" to be submitted to the Department **via e-mail communication to [industrialhemp@agriculture.arkansas.gov](mailto:industrialhemp@agriculture.arkansas.gov)** to request the disposal of the noncompliant material.
- f. Materials testing equal to or greater than 1.00% total delta-9-THC from a Pre-Harvest test result shall be destroyed in the presence of a Department representative, law enforcement, or both.
- g. The Department may collect samples of and test harvest material, but a Post-Harvest retest is not required.
- h. The variety may be labeled a Prohibited Variety and excluded from the Program.
- i. The Department shall issue a negligent violation for exceeding 1.0% Total THC.
- j. The Department may initiate proceedings to suspend or revoke the License and exclude the License Holder from future participation with the Department's Program.

### 4) **Remediated Post-Harvest Test Results of less than or equal to 0.3% (Total) delta-9-THC:**

- a. The Program will report results to the licensed grower via e-mail as soon as reasonably practicable.
- b. The Department designates the material as compliant; the lot is at the acceptable Hemp THC level and material is authorized for use or distribution in a manner consistent with the Program Rules. To that end, The Program Rules and the Arkansas Hemp Production Act do not allow the sale of leaf and/or floral material in any form to unlicensed entities, including the public consumer, wholesale distributors, retail shops, etc.
- c. Material allowed to market to licensed Hemp Growers or Hemp Processors that are licensed with either 1) a state's department of agriculture, 2) USDA's Hemp Production Program, or 3) a USDA-approved Hemp Program.



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### 5) Remediated Post-Harvest Test Results of greater than 0.3%, but less than or equal to 0.36% (Total) delta-9-THC:

- a. The Program will report results to the licensed grower via e-mail as soon as reasonably practicable.
- b. Accounting for the applied MU value of +/- 0.06%, the Department designates the material as compliant; the lot is at the acceptable Hemp THC level and material is authorized for use or distribution in a manner consistent with the Program Rules. To that end, The Program Rules and the Arkansas Hemp Production Act do not allow the sale of leaf and/or floral material in any form to unlicensed entities, including the public consumer, wholesale distributors, retail shops, etc.
- c. Any marketing of materials testing between 0.3% and 0.36% is at the License Holder's risk.
- d. Material allowed to market to licensed Hemp Growers or Hemp Processors that are licensed with either 1) a state's department of agriculture, 2) USDA's Hemp Production Program, or 3) a USDA-approved Hemp Program.

### 6) Remediated Post-Harvest Test Results greater than or equal to 0.37% (Total) delta-9-THC:

- a. The Program will report results to the licensed grower via e-mail as soon as reasonably practicable.
- b. The Department designates the material as noncompliant and ordered mandatorily destroyed.
- c. The Department may report noncompliant results to the USDA an applicable state or federal law enforcement agencies.
- d. The License Holder shall not transfer the harvested lot from the registered growing, storage/drying, or processing site. The noncompliant lot in question must remain segregated and labeled from other harvested hemp lots.
- e. The License Holder shall mandatorily dispose of the entire harvested lot without compensation and any unharvested crop of this variety from the lot. Within fifteen (15) days of receiving notice of a measured THC concentration exceeding the acceptable hemp THC level, a License Holder shall file a "***Destruction Request Form***" to be submitted to the Department **via e-mail communication to [industrialhemp@agriculture.arkansas.gov](mailto:industrialhemp@agriculture.arkansas.gov)** to request the disposal of the noncompliant material.
- f. Materials testing greater than or equal to 0.37% total delta-9-THC from a Post-Harvest test result shall be destroyed in the presence of a Department representative, law enforcement, or both.
- g. The Department reserves the right to run additional tests on post-harvest samples of that variety from the lot in the interest of furthering research efforts.
- h. Variety may be labeled a Prohibited Variety and excluded from the Program.
- i. The Department may issue a negligent violation to the licensed grower for producing a crop above 1.0% Total THC.
- j. The Department may initiate proceedings to suspend or revoke the License and exclude the License Holder from future participation with the Department's Program.

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### 7) **Varieties determined to be a Prohibited Variety:**

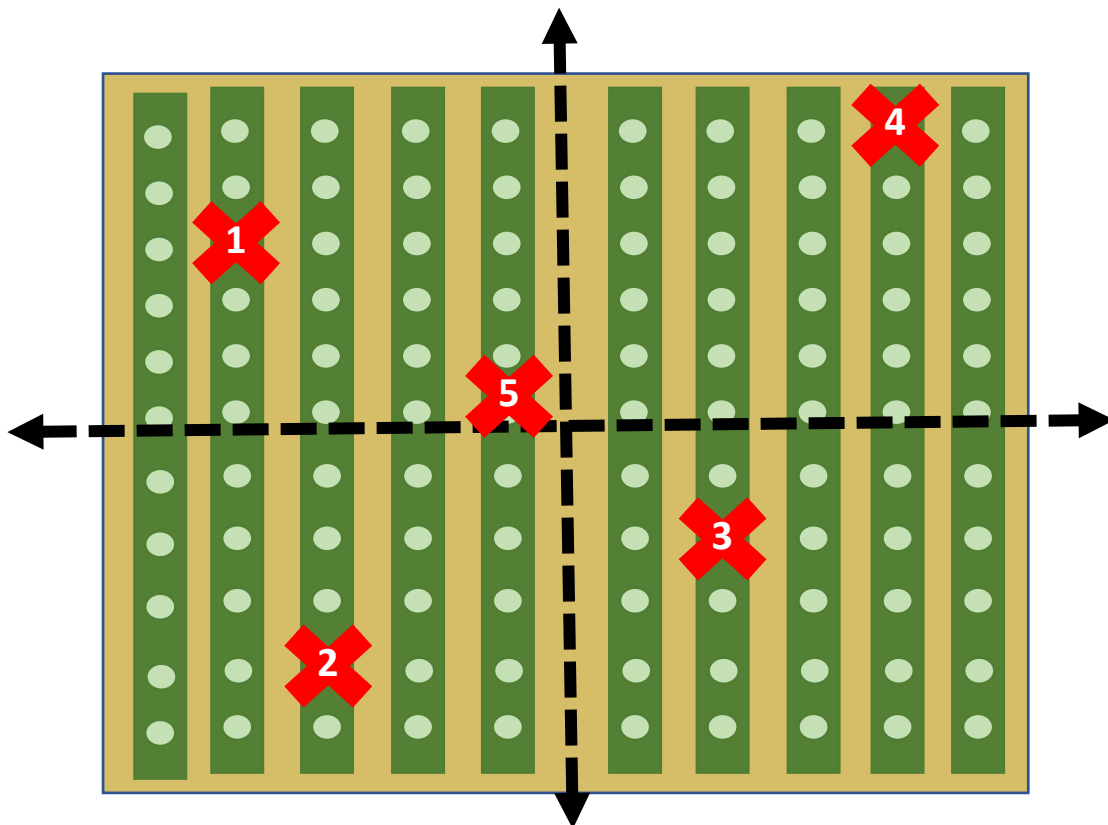
- a. Determined from lab data from previous growing seasons, the Department may develop a list of hemp varieties prohibited to plant, grow, harvest or market under the Program. This list is known as a “*Summary of Varieties List*,” located on the Department’s Hemp Program website.
- b. The Department may report the existence of a Prohibited Variety to relevant state and federal law enforcement agencies.
- c. If a variety is designated as a Prohibited Variety in the program, all material, including viable seed, live plants, stock plants, and all germplasm, shall be destroyed in the presence of a Department representative, law enforcement, or both.

### VIII. **Disposal of Noncompliant Harvested Material with Department Witness Present**

- 1) If a lot is designated for mandatory disposal, a license holder shall submit to the Department within fifteen (15) days of receiving a mandatory destruction order a “***Destruction Request Form***” via e-mail communication to [industrialhemp@agriculture.arkansas.gov](mailto:industrialhemp@agriculture.arkansas.gov).
- 2) The Department or law enforcement shall ensure that all leaf material and floral material from the noncompliant lot is disposed of using one of the approved destruction methods listed in **Table 2 (Page 16 of these procedures)**. The costs of disposal, if any are incurred by the Department, shall be charged to the license holder.
- 3) Disposals shall occur on-site at the licensed storage or growing location where the noncompliant harvest lot is presently stored. A Department inspector or representative shall personally observe the harvested material’s destruction without removing the harvested material from the license holder’s premises and document the destruction occurring with pictures before, during, and after destruction implementation. Destruction shall occur using one of the approved disposal methods listed in **Table 2 (Page 16 of these procedures.)**
- 4) If special circumstances arise and do not allow for a disposal on-site at the licensed storage or growing location by the license holder, the Department may approve a license holder’s request to dispose of the material by vehicle transport to a Department-approved location for destruction.
- 5) If the Department approves a license holder’s request to dispose of the material by vehicle transport to a Department-approved location:
  - a. Prior to transport, a Department inspector shall load, or observe the loading, of the harvested material until the material is completely secured on or in the vehicle.
  - b. During transport, a Department inspector shall accompany the harvested material as it moves in a vehicle directly to a Department-approved location. The vehicle shall constantly move towards its final destination without unnecessary stops, stops for reasons unrelated to transport task, or stops of an extended duration.
  - c. After transport and upon arrival at the Department-approved location, a Department inspector shall unload, or observe the unloading, of the harvested material until the material is completely removed from the vehicle.
  - d. After the material’s removal from the vehicle, a Department inspector shall personally observe the harvested material’s destruction using one of the approved disposal methods listed in **Table 2 (Page 16 of these procedures)**.



**FIGURE 1. Illustration of apical stem cutting for representative samples.** Illustration showing where cut should be made below flowering material from the cannabis plant's main apical stem. Cuttings should be eight (8) inches or 20 centimeters, including the mature plant's inflorescence.







**FIGURE 2. Illustration of four (4) quadrant representative lot sampling.** Example illustration representing a Field Plot with planted rows and individual plants. Dotted lines indicate the four-quadrant grid used for Pre-Harvest and Post-Harvest lot sampling. In this example, red X's represent where five (5) cuttings were collected for the Pre-Harvest compliance sample from five (5) plants. The fifth cutting may be collected from anywhere in the lot.



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Table 2: Approved Methods of Disposal/Destruction Activities from USDA-AMS, rendering materials non-retrievable or non-ingestible			
Photo Example	Ag Production Activity	Compliant Outcome	Photo Example
	<b>Plowing Under:</b> Curved plow blades rotate subsoil to surface and bury crop below	<b>Plowing Under:</b> - "Green Manure" - Amends soil directly from crop	
	<b>Mulching / Composting:</b> Fields crops cut and blended with manure or other biomass material	<b>Mulching / Composting:</b> - "Green Manure" - Mulch mixed with manure or other biomass	
	<b>Disking:</b> Leveling of field using tow-behind disk implement	<b>Disking:</b> - "Green Manure" - Amends soil directly from crop while leveling field	
	<b>Bush Mower / Chopper:</b> Commercial lawn mower used to shred and mix thick vegetation	<b>Bush Mower / Chopper:</b> - "Green Manure" - Shredded biomass decomposes into soil	
	<b>Deep Burial:</b> Fields are trenched, surface soil is buried at depth of at least 12"	<b>Deep Burial:</b> - Field biomass buried in trenches and covered with soil	
	<b>Burning:</b> Setting fire to specific production fields or biomatter piled on the field	<b>Burning:</b> - Fields are cleared of all plant material	





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**Table 3A:**

Number of acres	Sample Size
Less than 1	1
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

**Table 3A & 3B: Minimum number of cuttings for sampling hemp lots, dependent on lot size in acres of growing area.**

Tables 3A & 3B represented on this page describe the minimum number of cuttings that must be collected by the Department in order to meet the 95% confidence level requirements from the USDA-AMS's Final Rule. Tables are derived from the USDA-AMS's "Sampling Guidelines for Hemp" published on January 15, 2021.

**Table 3B:**

Number of acres	Sample Size	Number of acres	Sample Size	Number of acres	Sample Size	Number of acres	Sample Size
11	11	40	36	75-76	61	119-120	86
12	12	41-42	37	77	62	121-122	87
13	13	43	38	78-79	63	123-124	88
14	14	44	39	80-81	64	125-126	89
15	15	45-46	40	82	65	127-128	90
16	16	47	41	83-84	66	129-130	91
17	17	48	42	85-86	67	131-132	92
18-19	18	49-50	43	87	68	133-134	93
20	19	51	44	88-89	69	135-136	94
21	20	52	45	90-91	70	137-138	95
22	21	53-54	46	92	71	139-140	96
23	22	55	47	93-94	72	141-143	97
24	23	56	48	95-96	73	144-145	98
25-26	24	57-58	49	97-98	74	146-147	99
27	25	59	50	99	75	148-149	100
28	26	60-61	51	100-101	76	150-152	101
29	27	62	52	102-103	77	153-154	102
30	28	63-64	53	104-105	78	155-156	103
31-32	29	65	54	106-107	79	157-157	104
33	30	66-67	55	108	80	159-161	105
34	31	68	56	109-110	81	162-163	106
35	32	69-70	57	111-112	82	164-166	107
36	33	71	58	113-114	83	167-168	108
37-38	34	72-73	59	115-116	84	169-170	109
39	35	74	60	117-118	85	171-173	110