



Kentucky Department of Agriculture

Industrial Hemp Research Pilot Program Procedures for Sampling, THC Testing, and Post-Testing Actions

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Commissioner Ryan Quarles is a strong supporter of Kentucky's expanding community of industrial hemp growers and processors. Federal and state law charge the Kentucky Department of Agriculture (KDA) with responsibility for managing Kentucky's Industrial Hemp Research Pilot Program. In 2014, Congress enacted legislation permitting state departments of agriculture to conduct research pilot programs with industrial hemp despite the fact that cannabis remains a Schedule I substance, and is therefore off-limits for the general public, under the Controlled Substances Act of 1970 (21 U.S.C. § 801 *et seq.*). Congress specifically limited its authorization of state-level industrial hemp research pilot programs as defined in 7 U.S.C. § 5940 (2014 Farm Bill). KDA takes seriously its responsibility to enforce the limit established by Congress.

To that end, KDA shall conduct a sampling and testing program to confirm compliance with 7 U.S.C. § 5940 that defines industrial hemp as "the plant *Cannabis sativa L.* and any part of such plant, whether growing or not, with a delta-9 tetrahydrocannabinol [THC] concentration of not more than 0.3 percent on a dry weight basis."

In 2017, the Kentucky General Assembly enacted Senate Bill 218, codified as KRS 260.850 to 260.869, which revised the legal framework enacted in 2013 to improve its alignment with the federal authorization under 7 U.S.C. § 5940. In addition, KRS 250.355 requires KDA to collaborate with the University of Kentucky's Division of Regulatory Services to establish a testing program that will ensure that THC levels in industrial hemp produced by KDA's license holders do not exceed the 0.3% delta-9-THC threshold set by Congress.

KDA is committed to ensuring that crops grown under the auspices of KDA's Industrial Hemp Research Pilot Program are compliant with federal law and are, in fact, industrial hemp. Accordingly, KDA intends to inspect and sample 100% of hemp plots to be harvested. All varieties will be tested for compliance with the 0.3% delta-9-THC threshold set by Congress.

KDA has determined that these procedures are warranted by the growing body of industrial hemp research, ongoing policy improvements, strengthened partnerships with law enforcement, and evolving industry standards. KDA is continuously working to establish a sampling and testing standard for Kentucky that may serve as a model for other states. Due to the experimental nature of this research pilot program, KDA reserves the right to revise these procedures at any time.

I. Definitions

- (1) “ 9-THC” means delta-9-tetrahydrocannabinol concentration (the primary intoxicating component of cannabis).
- (2) “Certified seed” means seed for which a certificate or any other instrument has been issued by an agency authorized under the laws of a state, territory, or possession to certify seed and which has standards and procedures approved by the United States Secretary of Agriculture to ensure the genetic purity and identity of the seed certified. (see KRS 250.021)
- (3) “plot” means a contiguous area of hemp in a field, greenhouse, or indoor growing structure containing the same variety of hemp throughout the area.
- (4) “ppm” means parts per million.
- (5) “processing” means converting an agricultural commodity into a marketable form.
- (6) “Prohibited Variety” means a variety excluded from the KDA Industrial Hemp Research Pilot Program.
- (7) “Pre-harvest Sample” means a composite, representative portion from plants in a hemp plot collected in accordance with the procedures as defined in Section III of this document.
- (8) “Post-harvest sample” means a sample taken from the harvested hemp material from a particular plot’s harvest in accordance with the procedures as defined in Section V of this document; the entire plot’s harvest must be in the same form (intact-plant, flowers, ground materials, etc.), homogenous, and not mixed with non-hemp materials or hemp materials from another plot.
- (9) “seed source” means the origin of the seed or propagules as determined by the Hemp Program Staff, which may be from a business or individual supplying the seed or propagules to Kentucky License Holders.
- (10) “Variety of Concern” means any variety of industrial hemp in the KDA program that tests above 3000 parts per million (ppm) or 0.3000% 9-THC in one (1) or more pre-harvest samples. An industrial hemp variety designated as a “Variety of Concern” may be subject to restrictions and additional testing. Materials testing above 0.3% 9-THC may be subject to law enforcement action.

II. Sampling Timeline and Grower Responsibilities

- (1) A completed *Harvest/Destruction Report* Form from a grower shall be provided to KDA at least 15 days prior to the expected harvest date.
- (2) KDA’s receipt of a harvest notification triggers a site inspection and sample collection by a KDA inspector.
- (3) KDA inspectors shall contact the grower to confirm the field’s location and schedule a time for inspection and sample collection prior to harvest.
- (4) During the inspection, the grower or an authorized representative shall be present at the growing site.
- (5) Inspectors shall be provided with complete and unrestricted access to all industrial hemp and other cannabis plants, whether growing or harvested, and all land, buildings, and other

- structures used for the cultivation and storage of all industrial hemp and other cannabis plants.
- (6) The grower shall harvest the crop not more than 15 days following the date of sample collection by KDA, unless specifically authorized in writing by KDA.
 - (7) Harvested materials from Varieties of Concern shall not be comingled with other harvests without express permission from KDA.
 - (8) Floral materials harvested for phytocannabinoid extraction shall not be moved beyond the processor, nor comingled, nor extracted, until KDA releases the material.
 - (9) The License Holder shall be notified within 30 days of sampling the status of their testing and eligibility of their harvested materials to move into market research.

III. Pre-Harvest Sampling Procedure

- (1) All samples become the property of KDA and are non-returnable.
- (2) Equipment Used:
 - a) Inspection Form,
 - b) Pruning shears,
 - c) Alcohol wipes to clean shears before each sample,
 - d) Paper Sample Bags,
 - e) Stapler,
 - f) Sharpie marker to write sample ID on bag,
 - g) Bucket to transport bagged samples,
 - h) *Harvest/Destruction Report* forms, and
 - i) Maps.
- (3) The material selected for pre-harvest sampling will be determined by KDA, not the grower. Cuttings will be collected to make one representative sample.
 - a) Clip the top 20 cm of hemp plant's primary stem, including female floral material.
 - b) Take cuttings from at least five (5) non-adjacent hemp plants within the plot, from different areas representative of the entire plot at the discretion of the inspector.
 - c) Place the complete sample in a paper bag.
 - d) Seal the bag by folding over the top once and stapling the bag shut.
 - e) A separate sample must be taken from each non-contiguous plot of a given variety.
 - f) A separate sample must be taken for each variety.
 - g) Samples shall be secured in a paper bag (to allow for air-drying during transport).
 - h) Label the sample container with a sample ID. The sample ID shall include the last four numerical digits of the License number, Date (MMDDYY), and a two-digit sequential sample number assigned by the inspector.
 - i) Example: License# 17-80-11G, Sample Date March 30, 2017, Sample 03
 - ii) Translates to Sample ID: 8011-033017-03
 - i) The sample shall be transported to KDA for drying and storage.

IV. Handling Procedures of Pre-Harvest Samples

- (1) Samples will be taken to KDA for drying and storage.
- (2) Samples should be arranged in a single layer for drying.
- (3) Drying oven will be used when possible, at a temperature not to exceed 100°F.
- (4) Samples in the oven will be left in the labeled sample bag.
- (5) If selected for testing, the entire sample will be sent to KDA's testing lab for analysis.

V. Post-Harvest Sampling Procedures

- (1) All samples become the property of KDA and are non-returnable.
- (2) Equipment Used:
 - a) Inspection Form,
 - b) Pruning shears (if necessary),
 - c) Alcohol wipes to clean shears and/or sampling probe before each sample,
 - d) Sampling Probe (for ground material),
 - e) Paper Sample Bags for solid material,
 - f) Plastic Sample Containers for ground material,
 - g) Stapler,
 - h) Sharpie marker to note sample ID on sample container,
 - i) Bucket to transport samples,
 - j) *Harvest/Destruction Report* forms,
 - k) Maps, and
 - l) Results notification letter.
- (3) The plot selected for sampling shall be designated by the pre-harvest sample results. The material selected for post-harvest sampling from this plot will be determined by the KDA, not the grower. All post-harvest samples shall be taken from the designated harvested plot materials in the form (intact-plant, flowers, ground materials, etc.) in which the material will be sent to the processor. An inspector must inventory the entire harvest to determine the form in which it exists, and follow the protocol as appropriate in part a), b), or c) below.

If, upon inventory, the inspector determines that the entire harvest is not in a homogenous form (intact-plant, flowers, ground materials, etc.), the inspector shall notify the Hemp Program Manager. A License Holder who refuses to complete post-harvest processing preparations waives the right to a post-harvest test and the pre-harvest test results shall stand, and the plot materials shall be ordered destroyed .

License Holders are responsible for all post-harvest testing fees.

- a) For intact-plant post-harvest samples:
 - i) Ensure that the entire harvest is accounted for and in the same form (i.e., intact-plants).
 - ii) Clip the top 20 cm of hemp plant, primary stem, including female floral material.

- iii) Take cuttings from at least five (5) non-adjacent hemp plants within the harvest's storage/drying area at the discretion of the inspector.
 - iv) Place the complete sample in a paper bag.
 - v) Seal the paper bag by folding over top once and stapling to keep closed.
 - vi) Complete sampling procedures in part (d) – (f).
- b) For ground plant or ground floral material post-harvest samples:
- i) Ensure that the entire harvest is accounted for and in the same form (i.e., all harvested material whether whole plant or floral material only must be ground with no intact plants or whole flowers remaining from that harvest).
 - ii) Insert the sampling probe to remove material from bag or container.
 - iii) Sample from a minimum of four locations within the containers from a given harvest.
 - iv) Place the complete sample in a plastic sample container.
 - v) Seal the plastic sample container.
 - vi) Complete sampling procedures in part (d) – (f).
- c) For post-harvest samples in other forms (e.g., trimmed floral material, or floral material and stems, etc.):
- i) Ensure that the entire harvest is accounted for and in the same form (i.e., all harvested material must be uniform).
 - ii) Randomly collect at least one volumetric cup of material.
 - iii) Place the complete sample in a paper bag or plastic container and seal the container, as appropriate.
 - iv) Complete sampling procedures in part (d) – (f).
- d) A separate sample must be taken for each plot designated for post-harvest sampling.
- e) Samples shall be labeled, and prepared for transport to the lab.
- f) Label the sample container with a sample ID. The sample ID shall include the last four numerical digits of the License number, Date (MMDDYY), and a two-digit sequential sample number assigned by the inspector.
- i) Example: License#17-80-11G, March 30, 2017, Sample 03
 - ii) Translates to Sample ID: 8011-033017-03
- g) The sample shall be transported to KDA for storage.

VI. Handling Procedures of Post-Harvest Samples

- (1) Samples will be taken to KDA for storage.
- (2) The entire sample will be sent to KDA's testing lab for analysis.

VII. Selecting Samples for Testing

KDA reserves the right to test all industrial hemp and other cannabis plants crop produced by any License Holder for THC compliance. KDA intends to inspect and sample 100% of all

industrial hemp and other cannabis plots to be harvested, but not every sample will be tested. KDA will prioritize testing by using the following criteria.

- (1) Industrial hemp crops generated from Certified seed will incur pre-harvest testing of at least five percent (5%) of growing plots per variety, per seed source.
- (2) Industrial hemp crops from planting materials other than Certified seed will incur pre-harvest testing of at least fifty percent (50%) of growing plots per variety, per seed source.
- (3) 100% of post-harvest samples will be tested.

VIII. Testing Procedures

- (1) Testing shall be completed by KDA’s testing lab; the primary testing lab is the University of Kentucky Division of Regulatory Services, as mandated in KRS 250.355.
- (2) Quantitative determination of 9-THC levels will be measured using gas chromatography with flame ionization detector (GC-FID).
- (3) Test results shall be reported to License Holders by KDA.

IX. Post-Testing Actions

The 9-THC content for hemp produced in the KDA Industrial Hemp Research Pilot Program should not exceed the 0.3% 9-THC threshold sent by Congress. Because federal law provides a single digit, and KDA’s policy recognizes a margin of error in testing, the percent 9-THC is reported using only one digit. Additionally, in the interest of furthering research efforts and in recognition of variances due to growing conditions, weather, and varieties, KDA shall report the details of the test results including an exact measurement in parts per million (ppm). Testing results for all varieties shall be made public annually. Table 1 (below) provides a summary of the post-testing actions detailed in the following numbered points.

Table 1: Post-Testing Action Summary			
	Material allowed to market	Material not allowed to move – triggers post-harvest sampling and testing	Destroy industrial hemp
Pre-Harvest Test Results	≤ 3,999 ppm (1, below)	≥ 4,000 ppm – 9,999 ppm (2, below)	≥ 10,000 ppm (3, below)
	Material Allowed to Market	Destroy industrial hemp	
Post-Harvest Test Results	≤ 3,000 ppm, compliant (4, below)	≤ 3,999 ppm (5, below)	≥ 4,000 ppm (6, below)

(1) Pre-Harvest Test Results of less than or equal to 3,999 ppm (or 0.3999%) 9-THC:

- a) KDA will report results to grower.
- b) Material allowed to market.
- c) Any variety testing above 3,000 ppm shall become designated as a Variety of Concern.
- d) Any marketing of materials testing between 3,001 ppm and 3,999 ppm is at the License Holder's risk.

(2) Pre-Harvest Test Results of greater than 3,999 ppm, but less than 10,000 ppm 9-THC:

- a) KDA will report results to grower.
- b) The License Holder is not allowed to transfer an Individual plot's harvest. The harvest must remain segregated from other harvested plots until released in writing by KDA.
- c) License Holder is allowed to complete harvest activities, which may include drying, chopping, and/or grinding, in preparation for transfer to a processor.
- d) Triggers post-harvest sample and retest. License Holders must complete harvest activities, which may include drying, chopping, and/or grinding, on the entire harvest before the material is eligible for post-harvest sample collection.
- e) This hemp variety becomes designated as a Variety of Concern and KDA shall run additional tests on the samples collected from other plots of this variety.
- f) If more than 50% of Pre-Harvest Samples' test results for a given Variety of Concern are above 3,000 ppm, then this variety may be designated as a Prohibited Variety and excluded from the KDA Industrial Hemp Research Pilot Program.
- g) If a variety is designated as a Prohibited Variety in the KDA program, the KDA may require the License Holder to surrender without compensation the entire harvest and any unharvested crop, any live plants, and all germplasm of this variety to KDA for destruction. See Section 6(f).

(3) Pre-Harvest Test Results equal to or greater than 10,000 ppm 9-THC:

- a) KDA will report results to grower.
- b) KDA may report to the Kentucky State Police (KSP) and other law enforcement agencies.
- c) KDA may collect samples of and test post-harvest material in the interest of furthering research efforts. However, a post-harvest retest is not required.
- d) The variety may be labeled a Prohibited Variety and excluded from the KDA Industrial Hemp Research Pilot Program.
- e) KDA may terminate the License and exclude License Holder from future involvement in the KDA program.
- f) The License Holder must surrender without compensation the entire harvest and any unharvested crop of this variety from this plot, to KDA for destruction.

(4) Post-Harvest Test Results of less than or equal to 3,000 ppm (or 0.3000%) 9-THC:

- a) KDA will report results to grower.
- b) Compliant material; no action required.
- c) Material allowed to market.

(5) Post-Harvest Test Results of greater than 3,000 ppm, but less than 3,999 ppm 9-THC:

- a) KDA will report results to grower.
- b) Material allowed to market.
- c) Any marketing of materials testing between 3,001 ppm and 3,999 ppm is at the License Holder's risk.

(6) Post-Harvest Test Results equal to or greater than 4,000 ppm 9-THC:

- a) KDA will report results to grower.
- b) KDA may report to KSP and other law enforcement agencies.
- c) KDA reserves the right to run additional tests on post-harvest samples of that variety from that plot in the interest of furthering research efforts.
- d) Variety may be labeled a Prohibited Variety and excluded from the KDA Industrial Hemp Research Pilot Program.
- e) KDA may terminate the License and exclude License Holder from future involvement in the KDA program.
- f) License Holders must surrender without compensation the entire harvest and any unharvested crop, any live plants, and all germplasm of this variety, to KDA for destruction.

(7) Varieties determined to be a Prohibited Variety:

- a) KDA may report to KSP and other law enforcement agencies.
- b) License Holder must surrender without compensation any viable seeds, live plants, stock plants, and all germplasm of this variety, to KDA for destruction.