VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
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Hemp Pre-Harvest Sampling Protocol

Publication Date: August 25, 2020

Hemp or hemp is the *Cannabis sativa L.* and any part of that plant, including the seeds thereof and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, whether growing or not, with a delta-9 tetrahydrocannabinol (THC) concentration of no more than 0.3 percent on a dry weight basis. In Vermont, hemp is considered an "agricultural product" when grown by an individual that is registered with Vermont Agency of Agriculture, Food & Markets (VAAFM) as part of its Hemp Program.

VAAFM through its Hemp Program, authorized under 6 VSA, Chapter 34, registers hemp growers and processors. The VAAFM requires registrants to maintain sampling and testing records to indicate proof of compliance for potency and contaminants. A grower registrant must maintain records for a period of three years for all harvest lots grown in Vermont, and a processor registrant must also maintain records of pre-harvest sampling and potency and contaminants testing for harvest lots that come into their possession.

To be sufficient to meet the requirements for potency and contaminant sampling and testing under the Vermont Hemp Program Rules (VHPR) sampling and testing must be conducted as described in this protocol.

Section 1 Definitions:

1.1. Acceptable potency level means a hemp crop that has a delta-9 tetrahydrocannabinol concentration of 0.3 percent or less on a dry weight basis. This initial requirement accords with the federal 2014 Farm Bill. As an additional policy limitation implemented to protect public safety, the Agency also requires that the total theoretical tetrahydrocannabinol concentration not exceed one percent on a dry weight basis. The acceptable potency level may change as the law develops following the 2020 growing season.

1.2. Biomass means harvested hemp including the stalks and leaves and may include flowers/buds and/or seeds.

1.3. Cannabinoid means any of a group of closely related chemical compounds which include THC (tetrahydrocannabinol),THCA (tetrahydrocannabinolic acid),CBD (cannabidiol),CBDA (cannabidiolic acid),CBN (cannabinol),CBG (cannabigerol),CBC (cannabichromene),CBL (cannabicyclol),CBV (cannabivarin),THCV (tetrahydrocannabivarin),CBDV (cannabidivarin),CBCV (cannabichromevarin),CBGV (cannabigerovarin),CBGM (cannabigerol monomethyl ether),CBE (cannabielsoin),CBT (cannabicitran), and other active constituents that are naturally occurring in the Cannabis sativa L. plant.

1.4. Certificate of analysis means a certified laboratory's report describing its analytical testing and results.

1.5. Certified laboratory means a laboratory that is certified by the Agency under 6 V.S.A. § 567.

1.6. Contaminant means pesticide, solvent, heavy metal, mycotoxin, foreign material, or bacterial and fungal impurity introduced through cultivation or processing.

1.7. Cultivar means a plant variety with known characteristics that has been grown and produced by humans.

1.8. Cultivation area means one (1) contiguous tract of land, indoor facility or greenhouse used to produce or intended to be used to produce hemp.

1.8. Delta-9 tetrahydrocannabinol, also referred to as "THC," is the principal psychoactive cannabinoid found in the Cannabis sativa L. plant.

1.9. Dry weight means the weight of plant material with no greater than 13% moisture content.

1.10. Harvest lot means a grower's harvested hemp produced during a single growing season in a contiguous area containing the same cultivar or variety.

1.11 Harvest lot number means a unique numerical identifier that begins with the last four digits of a Grower's registration number, followed by the year of harvest, and a unique number to identify the harvest lot.

1.12. Hemp means the plant Cannabis sativa L. and any part of the plant, including the seeds and all derivatives, extracts, cannabinoids, acids, salts, isomers, and salts of isomers, whether growing or not, with a delta-9 tetrahydrocannabinol concentration of not more than 0.3 percent on a dry weight basis. The cultivation of hemp shall be subject to and comply with the required agricultural practices adopted pursuant to 6 V.S.A. § 4810.

1.13. Hemp crop means a standing or harvested crop or biomass. Use of "hemp crop" or "hemp crops" includes both the singular and plural usages whenever appropriate and shall be read to be inclusive of both forms whenever possible.

1.14. Registrant means a person registered with the Hemp Program.

Section 2 Inspections:

2.1. The VAAFM will conduct routine inspections of registered hemp fields, greenhouses, indoor grow facilities, and other growing locations to verify that hemp is not produced in violation of state and federal law.

2.2. Any samples or information collected as part of an inspection may be used in research by the Agency.

2.3. The VAAFM may inspect a registrant's premises, machinery, equipment and facilities, any crop during any growth phase or any hemp product or hemp-infused product during processing or storage. This inspection may include the taking of samples, inspection of records, and inspection of equipment or vehicles used in the growing, processing or transport of hemp crops, hemp products or hemp-infused products.

2.4. The VAAFM may take composite samples of any crops after harvest.

Section 3 Sampling Requirements for Compliance:

3.1. Sampling for harvest lots must be taken prior to harvesting, completed separately for each harvest lot, and must not be comingled with other harvest lots. Sampling must represent a homogenous composition of each separate harvest lot.

3.2. Samples must be managed in such a way as to avoid contamination from non-sampled material.

3.3. A Hemp Pre-harvest Sampling Form must be completed at the time sampling is performed and be signed and dated by the sampler and the grower.

3.4. Samples for a determination of compliance with the acceptable potency level shall be taken when the harvest lot is in flower and not more than 28 days before harvest [the 28 day timeframe for sampling is required by the Hemp Program in operation of its pilot program authorized under the 2014 Farm Bill].

3.5. A copy of the completed Pre-Harvest Sampling Form, for each harvest lot, must accompany the sample(s) to the laboratory. (The grower should retain the original form with their records.) A laboratory testing request form and chain of custody must be started for the samples and accompany the sample set to the laboratory.

3.6. Sampling may be performed by a sampling agent that reviewed the sampling protocol and understands the procedures outlined therein; VAAFM; or a laboratory certified by the VAAFM to conduct testing, pursuant to 6 V.S.A. §567.

3.7. The grower or their representative must be present during the sampling process.

Section 4 Sampling Equipment:

The sampler should bring the following equipment and supplies when sampling:

- Forms
- Aerial View Map(s)
- Garden shears -cleaned with alcohol wipes following each sample collection of a harvest lot
- Alcohol wipes
- Disposable gloves
- Sample bags (paper/plastic check with the lab)
- Packing or evidence tape
- Stapler if needed
- Marker and a Cooler

Section 5 Routine Survey and Sample Collection:

5.1. The sample pattern must ensure that all areas within the harvest lot are adequately and proportionately sampled and represents a composite of the harvest lot. See Table 1 for the number of plants to sample.

5.2. The sampler should enter a designated harvest lot, strategically examine the area, establish an approach for navigating the area, and collect individual cuttings as outlined by the procedure. This collection of cuttings represents the "sample" of the designated harvest lot. The final sample volume is as required by the procedure; if additional material is required for testing (as determined by the laboratory) then additional cuttings may be required.

5.3. The sampler must follow an "X" pattern when inspecting and sampling the harvest lot to the extent possible but may deviate from the pattern as necessary to account for the field conditions and to ensure that all areas are adequately and proportionately sampled to produce a representative composite sample of the harvest lot.

5.4. Each sample shall be taken only when plants are in flower and not greater than 28 days before harvest.

(a) Cuttings shall be taken at random from plant to plant and be from of a side arm flower.
(b) The sampler shall remove flowering material or inflorescences approximately 2 inches in length.
(c) The cutting from the plant shall not contain dead, diseased, pest infested, or injured plant material.
(d) The sampler shall select plants for sampling by the prescribed sampling pattern.
(e) Place each cutting in the sample bag.
(f) Place the sample bag in the cooler when you have completed sampling each harvest lot.

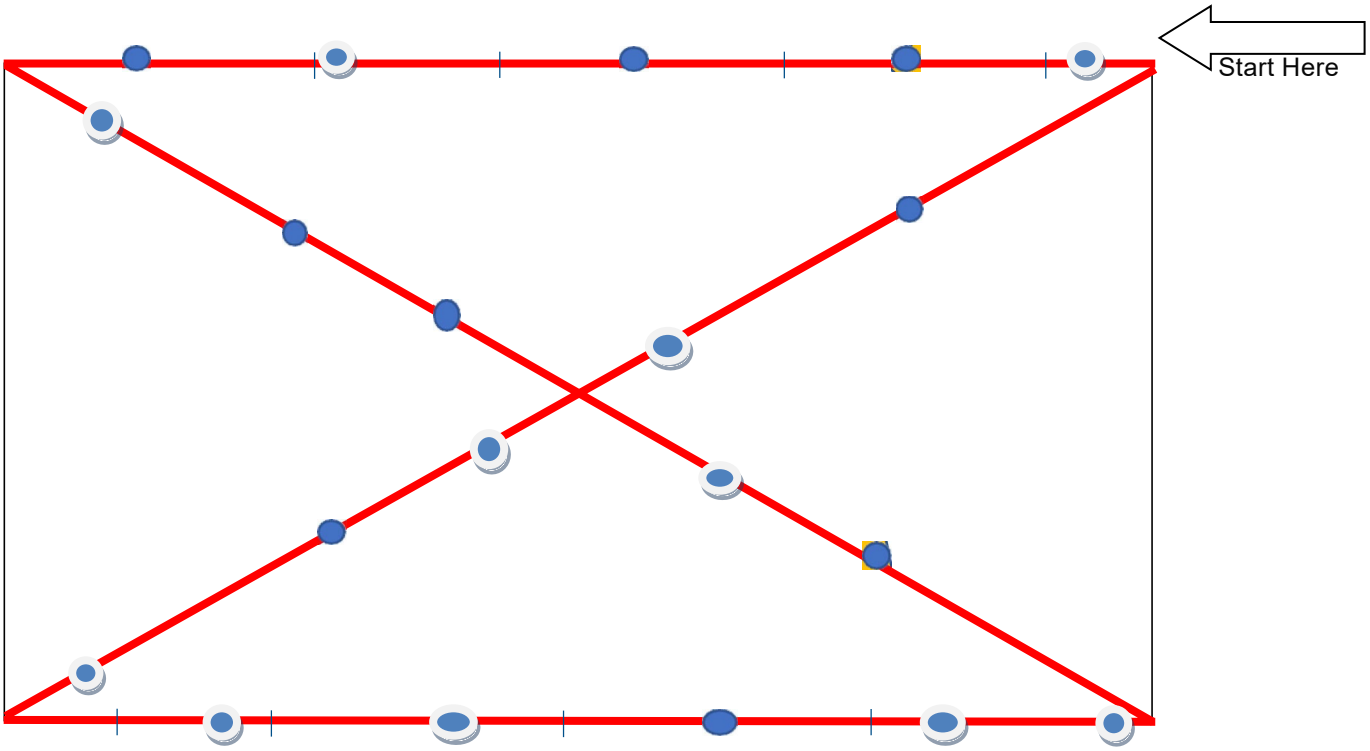
5.5. Deviations from the "X" pattern based on field conditions or sampling procedures shall be documented in the Hemp Pre-harvest Sampling Form, on the aerial view map included with registration, and with photographs.

5.6. Use the following procedure:

(a) Starting in one corner, walk along one edge of the field, collecting cuttings at approximately equidistant points along the transect of the harvest lot. The number of samples taken at each transect should be about ¼ of the total sample composite required.
(b) At the corner, continue the "X" pattern by walking diagonally through the field to the far corner. Again, at designated points along this transect, collect the required number of side arm flowers.
(c) Continue the"X" pattern by walking across the far side of the field to the opposite corner. At designated points along this transect, collect the required number of side arm flowers.
(d) Finish the "X" pattern by walking diagonally back to your original starting point. At designated points along this transect, collect the remaining number of side arm flowers to complete the final sample composite.

5.7. At the conclusion of sampling and inspecting, the sampler should have the total number of cuttings required in the representative sample of the harvest lot, or as outlined in Table 1. No more than 29

cuttings are required per sample when the harvest lot exceeds one acre.



5.8. For small fields or greenhouses, or when sampling from a known number of plants, the attached Table 1 may be used.

Table 1

Total Number of Plants	Number of Plants to Randomly Sample
1-13	All
14-15	13
16-17	14
18-19	15
20-22	16
23-25	17
26-28	18
29-32	19
33-38	**20**
39-44	**21**
45-53	**22**
54-65	23
66-82	24
83-108	25
109-157	26
158-271	27
272-885	28
886-1,500 or over one acre	29

5.9. The sample shall be securely contained in the sample bag and sealed (e.g. stapled or taped or evidence taped) in a manner that would show or exhibit evidence of tampering. The bags shall be uniquely marked with the harvest lot number, registration number, and other information as required by the laboratory. On the Forms (Hemp Pre-Harvest Sampling and The Laboratory Testing

Request/Chain of Custody), record the harvest lot number, date of sampling, sampler's signature, cultivar, and registered grower's registration number.

5.10. Place sample bags in the cooler for transport to the lab or to a secure location; samples should be kept cold or frozen.

Section 6 Transport of Samples:

6.1. All samples must be provided to the laboratory in the sealed bag using an appropriate tamper-evident method (e.g. stapled or taped or evidence taped). Consult with your testing laboratory for acceptable bags, seals, and shipping techniques.

6.2. Use of a certified laboratory will be required to establish compliance with the Hemp Program. The Cannabis Quality Control Program will provide a list of certified laboratories once they become available.

6.3. Copies of the following forms, containing appropriate signatures, shall accompany any sample submitted for testing:

(a) Hemp Pre-Harvest Sampling Form for each harvest lot- completed by the sampling agent and registered grower;

(b) A laboratory testing request form including a chain of custody, with all information required from the submitter.