

## Hemp Pre-Harvest Sampling Protocol

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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 (VAAFAM) as part of its Hemp Program.

VAAFAM through its Hemp Program, authorized under 6 VSA, Chapter 34, registers hemp growers and processors. The VAAFAM requires registrants to maintain sampling and testing records to indicate proof of compliance for potency and contaminant action levels. 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 contaminant results 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 Rules (VHR) 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 total delta-9 tetrahydrocannabinol concentration of 0.3 percent or less on a dry weight basis. All hemp analysis must report the total THC concentration levels, represented as the post-decarboxylation value of THC.
- 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 total 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. Sampling Agent means a person that is not a registrant and has a current certification from the United States Department of Agriculture to take pre-harvest samples of hemp crop, <https://www.ams.usda.gov/rules-regulations/hemp/information-sampling>.
- 1.15. 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 until compliant test results are returned to the registrant.
- 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 sampling agent and the registrant 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 30 days before harvest.
- 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 must be performed by a sampling agent that reviewed these sampling protocols and understands the procedures outlined therein.
- 3.7. The Agency will require that if a grower registrant fails to complete harvest within 30 days of sample collection, a second pre-harvest sample of the harvest lot must be collected and tested for total delta-9-THC concentration.
- 3.8. The Agency requires that no harvest may occur until samples are collected.
- 3.9. The registrant grower, employees of individuals or businesses registered to grow or process hemp,

individuals residing in the same household as a hemp grower registrant, or individuals related to Vermont Hemp Program registrant. may not be sampling agents and collect hemp samples.

3.10. 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:

- Sample Collection Forms
- Map(s), created at registration
- 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
- Permanent marker and a Cooler

#### **Section 5 Pre-harvest Sample Collection:**

- 5.1. A sampling agent shall collect a representative pre-harvest sample from a harvest lot to submit for testing for total delta-9-THC concentration. Samples must represent a homogenous composition of each separate harvest lot. The sampling agent shall not comingle harvest lot samples. See Table 1 for the number of plants to sample.
- 5.2. The sampling agent should verify the lot with the maps and GPS coordinates used with registration. Sampling agents shall 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 taken.
- 5.3. Sampling agents will walk in a "W" or zig zag pattern across the harvest lot, if possible, beginning on one side of the field and ending on the opposite side of the harvest lot. The sampling agent should take all reasonable steps to ensure that a sample is collected that represents a homogeneous composition.
- 5.4. Each sample shall be taken only when plants are in flower and not greater than 30 days before harvest.
  - (a) Cuttings shall be taken from the central flowering stem including incidental leaves, measuring 5-8 inches in length, and be selected from random plants.
  - (b) The cutting from the plant shall not contain dead, diseased, pest infested, or injured plant material.
  - (c) The sampler shall select plants for sampling by using the prescribed sampling pattern.
  - (d) Place each cutting in the sample container.
  - (e) Place the sample bag in the cooler when you have completed sampling each harvest lot.
- 5.5. Deviations from the "W" 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. For harvest lots of less than one acre, including greenhouses, select a minimum of 1 plant, then take a cutting from the plant to form the sample .
- 5.7. For harvest lots between 1-10 acres, including greenhouses, take at least one cutting per acre. For harvest lots above 10 acres, follow the chart provided in Table 1 of the Pre-Harvest sampling procedure.
- 5.8. The sampling agent must take the required number of cuttings based on harvest lot size. The cuttings should be at random and equidistant from each other. Avoid taking samples from the edges of the cultivation area.

Table 1

Number of acres	Sample Size "n"	Number of acres	Sample Size "n"	Number of acres	Sample Size "n"	Number of acres	Sample Size "n"
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

- 5.9. The sample shall be securely contained in the sample bag and sealed (e.g. stapled or taped) in a manner that would show or exhibit evidence of tampering. The bags shall be uniquely marked with the harvest lot number, grower name and registration number and contact information, sampling agent name and contact information, date of sample, 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. The sampling agent must deliver sealed samples to the certified laboratory, designated by the registrant grower. The sampling agent may also ship the sealed samples with an appropriate shipping agent.
- 6.2. 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 chain of custody form.