



Washington  
State Department of  
Agriculture

# Hemp Production Pre-harvest Sampling Protocol

*This document is based on language from USDA's interim final rule establishing a U.S. Domestic Hemp Production Program, with adjustments to align to Washington State's RCW 34.05.353.*

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## Purpose

1. Standard sampling guidelines are specified for field and greenhouse sampling of hemp.
2. Samples are taken to obtain specimens for the measurement of tetrahydrocannabinol (THC) content, which determine whether the specimens are hemp or marijuana. The measurements are intended to be representative of the THC content in a “lot” of hemp crop acreage as identified by the producer. Hemp producers may not harvest hemp prior to the hemp being sampled and tested for THC concentration. Testing procedures are provided in a separate document.

## Scope

1. Samples collected under this procedure are acceptable for submission to a qualified, DEA-registered laboratory for determination of THC in hemp.
2. Since the THC content of hemp generally peaks as the plant ripens, the timing of when sampling occurs is important to accurately measure THC concentration and monitor compliance with the WSDA hemp production program.
3. Samples must be collected by a WSDA inspector. It is the responsibility of the licensed producer to pay any fees associated with sampling.

## Summary of Practice

1. This practice provides procedures for entering a growing area and collecting the minimum number of plant specimens necessary to represent a homogeneous composition of the “lot” that is to be sampled. An authorized representative enters a growing area, strategically examines the growing area, establishes an approach for navigating the growing area, and collects individual specimens of plants in order to obtain a representative sample of hemp in the designated lot.
2. Cuttings from each “lot” of hemp crop acreage, as identified by the producer, shall be organized as composite samples. For the purposes of these procedures, a “lot” is a contiguous area in a field, greenhouse, or indoor growing structure containing the same variety or strain of cannabis throughout. In addition, “lot” refers to the batch of contiguous, homogeneous whole of a product being sold to a single buyer at a single time. “Lot” is to be defined by the producer in terms of farm location or field acreage.

## Equipment and Supplies

1. Garden pruners/shears (Cleaned prior to and following each composite sample. Some examples of appropriate cleaning agents and supplies to use on garden pruners/shears are bleach, rubbing alcohol, steel wool, and/or sandpaper.)

2. Sample bags, paper.
  - 2.1. The size of the bags will depend upon the number of clippings collected per lot.
  - 2.2. The bags should be made from material known to be free from THC.
3. Security tape
4. Permanent markers
5. Sample collection forms
6. GPS Unit
7. Disposable gloves – Nitrile

## Sampling Guidelines

1. The licensee or designated employee shall accompany the inspector throughout the sampling process.
2. Surveillance of the growing area
  - 2.1. The inspector shall verify the GPS coordinates of the growing area as compared with the GPS coordinates submitted by the licensee to WSDA.
  - 2.2. The inspector shall estimate the average height, appearance, approximate density, condition of the plants, and degree of maturity of the flowering material, meaning inflorescences (flowers/ buds).
  - 2.3. The inspector shall visually establish the homogeneity of the stand to establish that the growing area is of like variety.
3. Time of Sampling
  - 3.1. Within 15 days prior to the anticipated harvest of cannabis plants, a WSDA inspector shall collect representative samples from such cannabis plants for THC concentration level testing.
4. Field Sampling
  - 4.1. For purposes of determining the number of individual plants to select for sampling, the size of the growing area shall be considered. For sampling purposes, samples from separate “lots” must be kept separate and not be comingled.
  - 4.2. For lots of less than one acre, including greenhouses, select a minimum of 1 plant, then take a cutting from the plant to form a sample. For lots of 2 to 10 acres, including greenhouses, select a minimum of one plant per acre, then take cuttings of each plant, then combine to form a composite sample.
  - 4.3. For growing areas larger than ten (10) acres, including greenhouses, the number of plants that will be selected to form a composite sample is based upon the Codex Alimentarius Recommended Methods of Sampling for the Determination of Pesticide Residues for Compliance with MRLS CAC/ GL 33-1999.
    - 4.3.1. The sample size is estimated in a two-step process. The first step is to estimate the number of primary plants to be sampled. The second step is to adjust the estimate of primary plants by the acreage under cultivation.

4.3.2. The initial number of primary plants is estimated using

$$n_0 = \frac{\ln(1 - p)}{\ln(1 - i)}$$

where p is the confidence level to detect hemp plants having THC content greater than the acceptable hemp THC level and i is the proportion of hemp plants having THC content greater than the acceptable hemp THC level. The values for i are based on past experience in the same or similar growing areas.

4.3.3. The initial primary plants estimate is adjusted by the number of acres to calculate the minimum number of primary plants for composting as follows:

$$n = \frac{n_0}{1 + \frac{(n_0-1)}{N}}$$

where n is the minimum number of primary plants to be selected for forming a composite sample,  $n_0$  is the initial number of primary plants, and N is the number of acres under cultivation.

4.3.4. Example 1 : The initial primary plant sample size is 299 with a confidence level of 95% to detect hemp plants having THC content greater than the acceptable hemp THC level and a proportion of hemp plants having THC content of greater than the acceptable hemp THC level equal to 0.01 is considered appropriate. The adjusted primary plant sample sizes for fields from 11 to 173 acres in size are shown in the following table:

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	157-158	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

Example 2: The adjusted primary plant sample sizes for fields from less than 1 to 10 acres in size are shown in the table to the right:

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

5. Collecting Samples from each lot

- 5.1. Inspectors shall always walk at right angles to the rows of plants, beginning at one point of the lot and walking towards another point on the opposite side of the lot.
- 5.2. While walking through the growing area, the inspector shall cut at least "n" flowering material, meaning inflorescences (the flower or bud of a plant) at random but convenient distances. Avoid collecting too many specimens from the borders of the field/greenhouse.
- 5.3. The cut shall be made just underneath a flowering material, meaning inflorescence (the flower or bud of a plant), located at the top one-third {1/3} of the plant. (See figure below.) The sample size must be of adequate volume to accommodate laboratory tests.



- 5.4. Utilize a paper sample bag for collecting sample cuttings. Ensure that each bag has the minimum number of cuttings, n, as calculated by 4.3.3, or in the Example Tables 1 and 2.
- 5.5. Seal each bag and record the sample number.

6. Sample identification

- 6.1. The inspector shall seal each bag and record the sample identification number. The sample shall also be identified with the following information:
  - (1) The sample ID shall include: Inspector contact information; name and contact information of the producer; producer hemp license or authorization number; date of sample; and "lot" ID as provided by the USDA Farm Service Agency; any other information that may be required by States, Tribes, Law Enforcement Authorities, mail delivery services, customers or groups of customers.