Hemp Pre-Harvest Sampling for Compliance with the Vermont Hemp Program

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Introduction to Pre-Harvest Sampling

- What is considered pre-harvest sampling?
- Why is pre-harvest sampling important?
- How do I take compliant pre-harvest samples?

- What are the required forms and records needed for pre-harvest sampling?
- What is the difference between Vermont and USDA sampling requirements?

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Vermont Hemp Program Industry Update

2020 Registrations

- 552 Registrants (growers and processors)
- 1530 Acres registered
- 97 personal use registrations

2019 Registrations

- 1300 Registrants
- 9,000 Acres Registered

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What is the Practice of Pre-Harvest Sampling?

- Required by VAAFM and USDA
- Taking representative hemp flower samples from harvest lots for compliance purposes
- Different than sampling for marketing purposes

- Documenting the procedure as part of our required records
- Submitting harvest lot samples to laboratories to be tested.
- Keeping records for 3 years

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Why (is pre-harvest sampling important)

- Determine compliance with acceptable potency level
- Determine compliance with contaminant testing, depending on certain factors

- Acceptable potency level:
  A.) .3 Delta 9 THC
  B.) 1% Total THC (additional limitation)
- Harvest lot tested for pesticides if not certified organic
- Harvest lot tested for heavy metals if previous land use was orchard

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When: Do I need to take my pre-harvest samples?

- Samples for a determination of compliance must be taken during flower and not more than 28 days before harvest
- 1 -28 days before harvest
- Make a harvest plan
- Samples can be taken again anytime after pre-harvest sampling for marketing. These will not be considered compliance samples.

Remember: Definitions and Terms

- Harvest Lot - A grower's harvested hemp produced during a single growing season, in a contiguous area containing the same cultivar or variety.
- Key Words: Contiguous, Variety.
- We consider variety a phenotypic expression of a cultivar purchased. E.G. Lifter, Suver Haze, Cherry wine.

Sample Vs. Cutting

- Sample: homogenous collection of cuts taken per harvest lot, depending on prescribed pattern.
- Prescribed amount of cuts needed per harvest lot, depending on how big it is.
- Individual cuts do not get tested individually – we occasionally use the word interchangeably.

How: List of Materials

- Paper Bag for Samples (check with laboratory)
- Pre-Harvest Sampling Form
- Aerial Image Harvest Lot Map

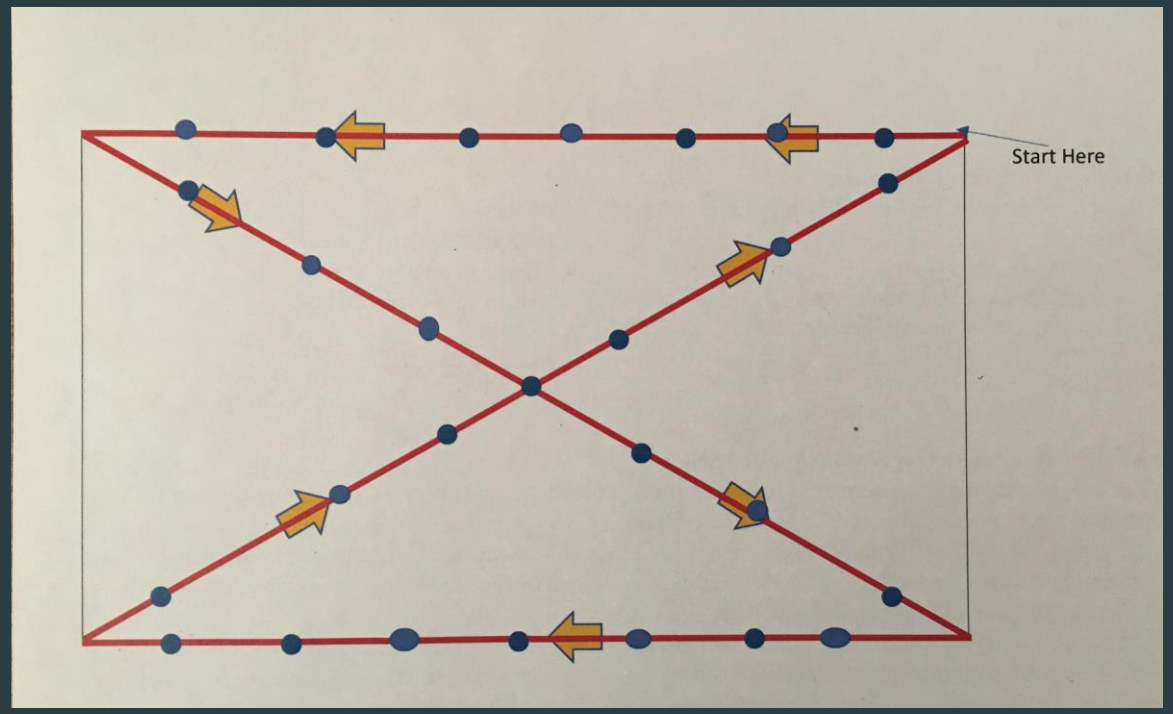
- Clean Snips / Garden Shears
- Disposable Gloves
- Tape / Evidence Tape to Seal Bag
- Cooler

How: Harvest Lot Planning

- Determine how many harvest lots you have
- Figure out how many samples are needed per harvest lot
- Map out your harvest lots using your aerial cultivation map
- Create a sampling pattern plan for each harvest lot
- Fill out pre-harvest sampling form information for each harvest lot

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 one acre	29

How: Prescribed Sampling Pattern



- When sampling a harvest lot, use this x pattern to the extent possible.
- Any deviations due to field conditions must be recorded in the pre-harvest form.
- Figure out how many cuts you will need to take per row, depending on harvest lot size.
- No more than 29 cuts are required when lot is ≥ 1 Acre.

How: Sample (and cutting) requirements

- Cuttings shall be taken from random plants, using sampling pattern
- The sampler shall take 2 inches of floral material from side arm flowers
- The sample shall not contain dead, diseased, or pest infested material
- Registrant must be present during sampling

- Samples should immediately be placed in a cooler to be kept cold until they reach the laboratory
- Samples must be managed in such a way as to avoid contamination from non-sampled material.
- Samples must not be comingled with other lots
- All samples must be submitted to a certified laboratory for testing in the future

How: Hemp Pre-Harvest Sampling Form

- The hemp pre-harvest sampling form must be completed after each harvest lot is sampled
- Sampler must record the date, time, cultivar sampled, GPS coordinates, etc.. for each lot
- Registrants must also assign each harvest lot a harvest lot #
- Sampler must also describe their harvest lot by growing location and type of cultivar
- Sampler must outline their sampling pattern using an aerial map of each harvest lot
- The pre-harvest sampling form and aerial map must accompany samples to the lab
- Check in with the lab you have chosen, they may have additional requirements for your sample

Pre-Harvest Sampling Form

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Hemp Pre-Harvest Sampling Form

INSTRUCTIONS FOR COMPLETING THIS FORM:

- Sampling may be performed by the registered Grower of the harvest lot; a registered Processor to whom the harvest lot will transfer for processing; a laboratory certified by the Vermont Agency of Agriculture, Food and Markets (VAAFM) to conduct testing, pursuant to 6 V.S.A. §567; or VAAFM.

- **IT IS NECESSARY TO COMPLETE EVERY SECTION OF THIS FORM LEGIBLY**. Incomplete or illegible forms shall not be proof of compliance with requirements in the Vermont Hemp Program Rules (VHPR), and the Registrant may be subject to enforcement by VAAFM.
- This form must maintained by the Grower registrant.
- The sampling entity must complete Hemp Pre-Harvest Sampling Procedure (page 2 of this Form) for *each* harvest lot. harvest lots may not be combined.
- For each harvest lot, the sampling entity must use a copy of the aerial view map of the cultivation area used in Hemp Program registration that depicts the location of the harvest lot.
- The **sampling pattern,** as outlined in the Pre-Harvest Sampling Protocol shall be illustrated legibly on the map, and the sampling entity may supplement this documentation with photographs containing a date and time stamp. The description and depiction must be sufficient such that the cultivation area of the harvest lot is apparent from a visual inspection of the premises and is easily discernable from other harvest lots and cultivation areas.

Sampling Entity Name:_____

Sampler(s) Name(s) (Printed): _____

_____

Date:_____Time Sampling Started:_____Time Sampling Completed: _____

Harvest Lot Number: _____ Grower's Registration Number:_____

Registered Grower Name: _____

Registered Grower Business Name, if applicable: _____
(if applicable)

Registered Grower Representative (present at the time of sampling) _____

AGREEMENT

The harvest lot described in the Hemp Pre-Harvest Sampling Procedure included with this form accurately reflect the harvest lot location and description and the sampling conducted by the sampling entity. The Registered Grower agrees to the sampling as described in the attached Descriptions.

_____ _____

Registered Grower/Representative Signature
Signature Name:

Sampler
Name:

HEMP PRE-HARVEST LOT SAMPLING PROCEDURE

Harvest Lot Type (check at least one):

Flower/Biomass	Seed	Fiber	Other

Cultivars: _____

Plant spacing: _____

Grow Area Type and Area (square foot or acres):

Field	Greenhouse

Declared Harvest Date: _____

Address associated with cultivation area:

_____

IMPORTANT: This must be the same as the cultivation area depicted on aerial view maps provided at registration with the VAAFM.

GPS Coordinates of Access to field: _____

Harvest Lot Number:

_____

NOTE: "Harvest lot number" is the unique numerical identifier designated by the Grower that begins with the last five digits of a Grower's registration number, followed by the year of harvest, and a unique number to identify the harvest lot. This clarifies when more than one "Harvest Lot" is located in the same "cultivation area". A new "Hemp Pre-Harvest Sampling Form" must be completed for each harvest lot.

Written Description: Describe the location of the harvest lot to be sampled such that the growing area is apparent from a visual inspection of the premises and is easily discernable from other harvest lots:

_____

_____

_____

_____

_____

Visual Depiction: Provide the aerial view map depicting the registered cultivation area and the harvest lot showing at least one prominent feature (road, building, etc.), attach to this form.

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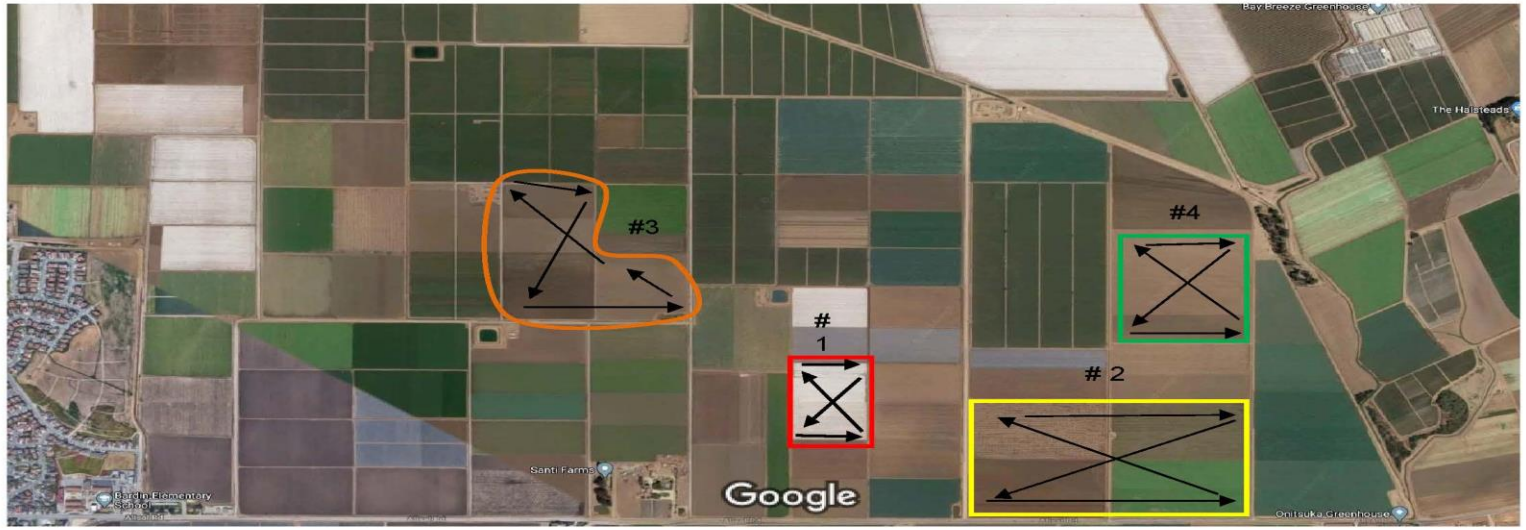
Salinas, CA 12345

Hemp Pre-Harvest Sampling Map 10/10/2020



Key:

#1 (Red Box): 29 cuts Lifter - #40242020001

#2 (Yellow Box): 29 cuts Hawaiian Haze - #40242020002

#3 (Orange Box): 29 Cuts Suver Haze - #40242020003

#4 (Green Box): 29 Cuts Lifter - #40242020004

USDA: Pre-Harvest Sampling Comparison

- Not required for fall harvest 2020
- Samples must be of top 1/3rd of plant (flowering colas)
- Samples must be taken not more than 15 days before harvest
- Must be taken by agency representative / certified sampler.
- Acceptable potency level is .3% across the board; total THC .3%
- All crops must be harvested by October 31 to be considered under Vermont pilot.

Trace update

- Trace is now live
- Registration portal - paper applications no longer required
- If you registered in 2020, your information was automatically uploaded for you.
- Emails have been sent to all registrants for login instructions

- All application requirements such as mapping and payments can be done using Trace
- In the future, all required pre-harvest sampling documentation can be uploaded into Trace by registrants
- CoA's and other required records can be uploaded as well

Required Testing for Fall Harvest 2020

Required Testing

- Required testing for hemp crops, hemp products, and hemp infused products is listed on Table 2 of the cannabis quality control program document.
- Table 3 through 8 list the testing parameters with the associated action limits. Any test result above an action limit indicates a failure for that product lot.

Certification of Laboratories

- The Hemp Group will begin certifying labs once the cannabis quality control program has been finalized.
- Testing compliance samples will require a certified laboratory, once the cannabis quality control program is fully operational

Required Testing for Fall harvest 2020

(Vermont Cannabis Quality Control Program)

Table 2, testing requirements:

	potency	Moisture or water activity	Microbiological (mycotoxins, aerobic microbial, combined yeast & mold)	heavy metals	pesticides	Residual solvents
Harvest lot						
	Each lot	Each lot	N/A	Note 5	Each Lot Note 6	N/A
Plant material						
Trim flower	Note 1	Each process lot	Each process lot	Note 1	Note 1	N/A
Concentrates						
Liquids	Each process lot	N/A	Each process lot	Each process lot	Each process lot	Note 3
Solids	Each process lot	N/A	Each process lot	Each process lot	Each process lot	Note 3
Infused products						
Liquids, including infused products (tinctures, water based)	Note 4	N/A	Note 2	Note 1 or Note 2	Note 2	Note 2 or Note 3
Solids, including infused edibles, tablets	Note 4	N/A	Note 2	Note 1 or Note 2	Note 2	Note 2 or Note 3

Table 2 Notes

- Note 1 Harvest lot testing is sufficient to show compliance.
- Note 2: Trim flower or hemp concentrate testing is sufficient to show compliance.
- Note 3: Residual solvents are tested whenever solvent based extraction techniques are used.
- Note 4: Please apply Vermont Hemp Program Rule Section 8.3 (a) for potency. (Summarized, a hemp product or hemp-infused product process lot complies when a CoA demonstrates that the product meets the acceptable potency level or the processor's formulation demonstrates compliance with the acceptable potency level.) Please apply Vermont Hemp Program Rule Section 6 for processors. (Summarized: all claims of a specific quantity of any cannabinoid must be analyzed at least once to confirm formulation).
- Note 5: Testing for heavy metals is required whenever the hemp crop land was used for orchard crops or any land use other than farming as defined in the Required Agricultural Practices Rule, unless a recent soils test demonstrates that the heavy metals are within the authorized action limits for soils.
- Note 6: No pesticide testing required if crop is certified organic.
- Note 7: Testing for other contaminants is necessary when the Agency of Natural Resources has approved biosolids applications to the hemp crop land.

Testing Parameters and Action Levels

(Vermont Cannabis Quality Control Program)

Table 3. Potency parameters and limits

parameter	Action limits (%)	Product labeling
d9-THC	0.3	
Total THC	1.0	Within 10% of label value
CBD, and CBD-A	none	Within 10% of label value
Other cannabinoids	none	Within 10% of label value

Table 4. Moisture parameters and limits (either analysis)

Parameter	Action limits for trim flower
Moisture content	13 %
Water activity	0.65

Table 5. Microbiological parameters and limits

Parameter	Action limits dried cannabis bud/biomass	Action limits for concentrates	Action limits for random sampled capsules, tinctures, topicals, etc
Count			
Total Aerobic Microbial Count (CFU per gram or ml) *	100,000	10,000	1000
Total Combined Yeast and Mold count (CFU per gram or ml) *	10,000	1000	100
Mycotoxin: the total of Aflatoxin B1, B2, G1, and G2	20 ppb	20ppb	20ppb
Mycotoxin- Ochratoxin A	20 ppb	20ppb	20ppb

Table 6. Metal parameters and limits

parameter	Trim flower and dried biomass action limits (ppm, mg/kg)	Concentrate action limits (ppm)	Soil action limits (ppm, mg/kg) for agricultural use (additional levels for Cr, Cu, Ni, and Zn) Note 1.
Arsenic	0.200	1.500	---
Cadmium	0.200	0.500	0.43
Lead	0.500	1.000	200
Mercury	0.100	1.500	---

Testing Parameters and Action Levels

(Vermont Cannabis Quality Control Program)

Table 7. Pesticide parameters and limits

parameter	Action limits (ppm, mg/kg, mg/l)
Acephate	10
Acequinocyl	0.5
Avermectin	0.01
Azoxystrobin	0.2
Bifenazate	1
Bifenthrin	0.2
Carbaryl	0.2
Chlorothalonil	1.0
Chlorpyrifos	0.2
Cypermethrin (zeta) sum of isomers	1.0
Diazinon	0.2
Ethephon	2
Etoxazole	0.5
Imazalil	0.1
Imidaclobutanil	0.05
Myclobutanil	0.03
Pyrethrins (sum of 3 isomers)	0.5
Spinosyn (each for spinosad A & D)	0.01

Table 8. Residual solvent parameters and limits

parameter	Action limits (ppm, mg/kg, mg/l) concentrates
Acetone	5000
Acetonitrile	410
Benzene	2
Chloroform	60
Ethanol	5000
Heptanes (total)	5000
Hexanes (total)	290
Isopropyl alcohol	5000
Methanol	3000
Methylene Chloride	600
Toluene	890
Xylenes (total)	2170
Any solvent not permitted for extraction in the hemp rule (butane, propane, or other hydrocarbons) each	5000

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