VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
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Frequently Asked Questions

Understanding a Certificate of Analysis Under the Pilot Program[1]

This FAQ is to help explain the results of a certificate of analysis (CoA) or laboratory report that documents cannabinoid content. It discusses the difference between delta-9-tetrahydrocannabinol concentration, tetrahydrocannabinolic-acid, and total theoretical tetrahydrocannabinol content, and what is the acceptable potency level under the pilot program authorized by the 2014 Farm Bill. As a supplement to the required delta-9- tetrahydrocannabinol potency level, Vermont's Hemp Program utilizes an additional limitation of one percent total theoretical THC.

- **What is the acceptable potency level for a hemp harvest lot?**
  - The acceptable potency level as shown on a CoA or report is a delta-9-THC concentration of 0.3 percent or less on a dry weight basis; **and** as an additional limitation, total theoretical tetrahydrocannabinol concentration (content) of one percent or less on a dry weight basis.
- **How do I know if the contents of my CoA are reported on a "dry weight" basis?**
  - The report should include the statement reported on a "dry basis" or "dry weight basis."
  - If the laboratory results are not reported on a dry basis, the laboratory must report "moisture content" or "percent moisture." Cannabinoid content can then be calculated to represent a dry basis percentage.
- **How do I determine if my harvest lot meets the THC standards from the CoA?**
  - A CoA must provide the information necessary to determine if a harvest lot meets the acceptable potency level.
  - A cannabinoid summary should include percent weight data for delta-9-THC (sometimes represented as THC, d9-THC or Δ9-THC) and THCA, CBD and CBD-A, and total theoretical CBD and THC.

Definitions

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.

Cannabidiol or **CBD** is one of the naturally occurring cannabinoids found in the Cannabis sativa L. plant.

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

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

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

Tetrahydrocannabinolic acid (THCA) is the precursor of delta-9 THC.

Total theoretical tetrahydrocannabinol content (or total theoretical THC) is the maximum amount of possible delta-9 tetrahydrocannabinol in a hemp crop if total conversion were to occur.

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[1] Each registrant is individually responsible for complying with federal and state law. This FAQ is not a legal analysis; it exclusively explains how Vermont plans to interpret hemp program results for the 2020 season.

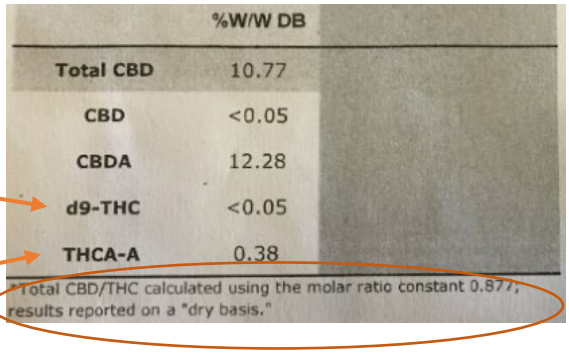
- If your laboratory results do not provide total theoretical values for THC, a calculation may be used to determine the total theoretical results for a harvest lot.
- As a policy to protect public safety, the Agency requires that the total theoretical tetrahydrocannabinol concentration not exceed one percent on a dry weight basis.

Illustration 1

(<0.05% or 0%) + (0.38% x 0.877) = 0.33% Total theoretical THC

delta-9-THC = <0.05% or 0%

THCA = 0.38%



	%W/W DB
Total CBD	10.77
CBD	<0.05
CBDA	12.28
d9-THC	<0.05
THCA-A	0.38

*Total CBD/THC calculated using the molar ratio constant 0.877; results reported on a "dry basis."

The acceptable potency level is met with a delta-9 -THC concentration of < 0.05% or 0%, and is acceptable, and the total theoretical THC concentration is 0.33 % and less than 1.0% limitation.

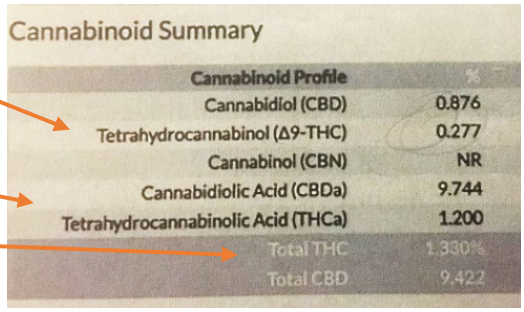
Illustration 2

(0.277%) + (1.2% x 0.877) = 1.3% Total theoretical THC

delta-9-THC is below 0.3%

THCA is 1.2%

Total THC is 1.329%.



Cannabinoid Summary

Cannabinoid Profile	%
Cannabidiol (CBD)	0.876
Tetrahydrocannabinol (Δ9-THC)	0.277
Cannabinol (CBN)	NR
Cannabidiolic Acid (CBDa)	9.744
Tetrahydrocannabinolic Acid (THCa)	1.200
Total THC	1.330%
Total CBD	9.422

The delta-9-THC concentration of 0.27% is acceptable, but not the total theoretical THC, which is 1.3 %, and exceeds the 1.0% limitation.

- **When should I test my crop?**
  - Harvest lots must be designated and sampled 28 days before harvest as outlined in Vermont's Pre-Harvest Sampling Protocol.

The calculated amount is determined as follows:

the sum of the concentration of delta-9 tetrahydrocannabinol added to the amount of tetrahydrocannabinolic acid after it is multiplied by 0.877 on a dry weight basis and reported to two significant figures. The mathematical equation follows:

$Total\ theoretical\ THC$ = ([$delta$ 9 THC] + ([$THCA$] $*$ 0.877)

Calculations

Total theoretical tetrahydrocannabinol content calculation:

Total theoretical THC % = (delta-9-THC%) + (THCA% x 0.877).

Dry weight basis calculation:

Total theoretical cannabinoid % / (1.0 – wet weight %/100) = adjusted cannabinoid content or dry weight

Resources

https://agriculture.vermont.gov/public-health-agricultural-resource-management-division/hemp-program/hemp-resources-and-guidance

Pre-Harvest Sampling Protocol

Onsite Sampling Form

Chain of Custody Form