

Comparison of Field Sampling Protocols for Industrial Hemp

A THC level below 0.3 wt% on a dry basis is the measurable component of the legal definition distinguishing industrial hemp from marihuana. Even though never meant to be a regulatory limit, the 0.3 wt% definition has been adopted throughout both federal and state legislation that is allowing the crop to be brought back into American production.

Over simplifying analytical methods, usually they are made up of three parts: the sample collection, the sample preparation, and the sample measurement. In the case of THC measurement, the sample measurement is very well understood. The gas chromatography or liquid chromatography methods are accurate and reproduceable. The sample preparation relies the skill of an analytical chemist or lab technician. The samples are solids and must be reduced from the field collected composite to the sample aliquot used in the measurement equipment. Although the handling and sample preparation of solid materials is much more variable than with liquid samples, the skill of the lab technician or chemist performing these protocols is very repeatable. The sample collection method in the field is usually where there could be the most variability in the three parts that make up the overall method.

The protocols for collecting the sample from a standing field of industrial hemp varies from state to state. The protocol seems simple enough but given the fact that different parts of the plant have differing levels of THC and other cannabinoids, the collection of a representative sample of the field is not so straightforward. Many protocols leave much to the discretion of the field sample technician. After time, this discretion could become statistically stable as the number of sampling events grow and the industry has more opportunity for swapping notes on the nuances that would drive different specific details in specific sampling cases. However, with the variability in the understood protocols currently, there is a potential for many problems. In addition, with the THC level set so arbitrarily low, there could be great economic risk due to the wide statistical variability that can occur with various sampling protocols.

Differences in the Major Components of Industrial Hemp Field Sampling Protocols

	Canada	Vermont	Colorado	Kentucky	Oregon	Washington	Hawaii	US Hemp Round Table	New Zealand	New York	United Nations
Cuttings in each composite	30	undefined	"sufficient"	5	30			at least 5	min 5, max 20	12	30
Field Sample Cutting Pattern	walk at right angles to rows				walk field perimeter and "X" with 7 samples on perimeter path and 8 on each cross of the "X"					randomly spaced	
Cutting Location on Plant	top 1/3	top 8 cm (3 inches)	top 2 inches	top 20 cm (8 inches)	top 8 inches		top 2 inches	top 12 inches		top 10 inches	top 20 cm (8 inches)
Field Sample Timing in Grow Season		10 days prior to harvest	30 days prior to harvest						2 to 3 weeks prior to harvest	2 weeks prior to harvest	
Field Sample Timing Based on Seed Maturity	50% of seeds resistant to compression	50% of seeds resistant to compression	50% of seeds resistant to compression								