1st Quarterly Report – 2017

Cannabis Flower Sampling Recommendations Derived From Analysis Of Cannabinoid Variance in a 4 Cultivar Cultivation Test Plot

This report is generated for the General and Sponsoring Members of The Clinical Endocannabinoid System Consortium (The CESC)

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Executive Summary

We continue our ongoing Cannabis Chemotyping analyses with a detailed description of Cannabinoid content from a 2016 season Humboldt County test plot. The Tetrahydrocannabinolic acid (THCA) % potency results from a Design of Experiment (DOE) screening model of various cultivation main effects is presented. A sampling scheme utilizing a Sentinel Plant is proposed. Power analysis is applied to the dataset to derive optimal sampling number and guidelines for potency analysis, potentially applicable to much larger cultivation plots. Our intent is to provide some empirical background and guidance to support best practices for sampling and testing the Cannabis agricultural commodity.

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Background & Rationale

The Cannabis industry needs robust sampling guidance

How many of us have gone into a medical Cannabis dispensary and been told by the staff that a particular strain has, for example, 24.34% THC? What does that mean? There are typically no ranges reported for these values, no error factor, or no ± values for guidance. Does that mean that every flower in the jar has the same potency? It stretches credibility that this is the case. We intuitively expect there is likely some range, but we really are not given any guidance.. In other industries sampling, reporting, and testing guidelines are a routine part of best practices. Because the medical Cannabis industry is just now coming out of the shadows of prohibition we lack such clear guidance. The CESC believes that the creation of these best practices should be an integral part of the medical Cannabis industry. As part of our mission, we recently undertook a study of potency variance in controlled Cannabis cultivation test plots in order to come up with recommendations for sampling for potency testing. The results we obtained and the conclusions we have reached are described in this report. It is our intention and belief that adaption of these recommendations may lead to a safer and more reliable medical Cannabis product.

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> -Dr. John Abrams

The basis of our sampling study derives from a larger effort mounted by SICPA. This organization is a leading global provider of secured identification, traceability and authentication solutions and services. It produces the authenticity stamps on cigarette packages and is currently being evaluated for a similar role in the State of California's Medical Cannabis Track and Trace program. During the 2016 growing season, qualified cultivators took part in test plot program in conjunction with the Humboldt County Agricultural Department for MCRSA compliance. The program was designed to provide yield data from defined canopy sizes. This pilot study offered us a perfect opportunity to merge in our own sampling study. Our approach was to incorporate an *ad-hoc* Design of Experiments (DOE) Approach and analyze potency variance to derive sampling size guidelines. By using a statistical tool known as Power Analysis, we derived the number of (replicate) samples necessary for analysis. This method is based on the variance or experimental error of the data.

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