



**Washington State
Liquor and Cannabis Board**

Canopy Report

June 2020



Executive Summary

In October of 2017, the Washington State Liquor and Cannabis Board (LCB) began conducting surveys of marijuana canopy at state licensed producers. Surveys were conducted over two years, with a goal of visiting all licensed marijuana producers and measuring every marijuana plant. It was not possible to accomplish either of these objectives for several reasons; however, enough visits were conducted and data collected that conclusions regarding the use of licensed canopy can be drawn. A report summarizing year one of data was published in March 2019, and the following report summarizes year two's data. Also included is a comparison between years one and two.

LCB conducted a total of 1,565 surveys between 2017- 2019; with 792 in year one and 773 in year two. Results from year one and year two are generally similar. Data continues to indicate that on average, less canopy is grown than licensed. In both years, surveys found some licensed locations with no canopy and others with canopy in excess of their licensed max.

The proportion of total observed canopy to licensed canopy (canopy utilization) decreased from year one to year two, while total observed canopy appeared relatively unchanged. Over the same period, there was a decrease in the total number of licensed marijuana producer locations (1,179 at the publishing of year one and 1,104 at this time). Both of these data points indicate a slight shrinkage of observed marijuana canopy.



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¹ All photographs included in this report were taken by staff during survey visits.

Introduction

Marijuana production at state licensed producers is governed by a limit on the size of the square footage dedicated to live plant production (plant canopy) at a location. LCB licenses producers in three canopy brackets: Tier 1 (1-2,000 sq ft), Tier 2 (2,001-10,000 sq ft) and Tier 3 (10,001-30,000 sq ft).

The LCB collects information on canopy through licensing operations. Any application establishing or changing an operating plan for a marijuana producer location requires the applicant to list the intended amount of plant canopy for that location. Before the canopy project began, this was the only data point that the agency collected on canopy.

The state traceability system collects information on all marijuana produced, processed and sold in Washington's regulated market place, but this system does not directly track canopy. Through traceability, important statistics can be derived on the number and harvested weight of marijuana plants in Washington, but these statistics are only associated with, rather than directly determined by, plant canopy.

The canopy project, started in 2017, provides supplemental information about the physical size of plants grown in Washington. This data is a helpful supplement to both the state traceability and licensing systems because it provides firsthand information about the size of marijuana plants, a data point not captured by either system.





Data collection for the survey consisted of taking average plant measurements, a simple inventory of cannabis plants and general notes about the cultivation space for each licensed producer location. Almost all measurements were taken by hand except for a small number of surveys in year one, which were conducted with a remote aerial imaging platform.

Following is a summary of survey results with data including the number of licenses surveyed, their observed total canopy area, and overall averages of canopy utilization. Comparison between the two years of data shows a slight decline in canopy utilization and similar amounts of observed total canopy year to year.

The survey also provided an excellent opportunity for candid interaction between LCB staff and marijuana producers. While not the primary purpose of the survey, the thousands of conversations facilitated by the survey provided important perspectives into the producer experience. Each individual conversation may be viewed as anecdotal, but a large collection of anecdotes forms a unit of usable qualitative data. Themes from these conversations were identified in the year one report, and updates to those themes are provided below based on year two.

Survey Results

Following is a charted summary on the number of producers surveyed, canopy observed and canopy utilization. 792 surveys were conducted in year one, and 773 in year two. Surveys were taken throughout the state.

We do not recommend general conclusions about canopy be drawn directly from all charts, because data collected by this project cannot be viewed as a population survey of canopy for two reasons. First, the canopy project was not able to survey every producer in either year, which means that by definition, it is not a population survey. Second, any single survey may not be the most representative set of observations for an individual producer because the physical size of the marijuana present at a location changes throughout production cycles. For more robust figures, this report provides averages on canopy utilization, which should be less sensitive to these issues.

The chart below provides a total count of surveys conducted during both years, as well as figures for subcategories for combinations of tier and indoor versus outdoor production.

Count of Producers Surveyed		
	2017 Survey	2018 Survey
Tier 1 (1-2000sqft)	135	115
Indoor	117	92
Outdoor	18	23
Tier 2 (2,001-10,000sqft)	353	327
Indoor	235	227
Outdoor	118	100
Tier 3 (10,001-30,000sqft)	304	331
Indoor	119	122
Outdoor	185	209
All	792	773

Fewer producers were surveyed in year two than in year one. The distribution of surveys between tiers and indoor to outdoor grows remained similar in both years, with some slight differences. In year two, more Tier 3 and fewer Tier 1 and Tier 2 were surveyed.



About 4 million square feet of canopy was observed in both years. The following chart provides total canopy observed, as well as the proportion of observed canopy to total canopy for each subcategory.

Area of Canopy Observed				
	2017 Survey		2018 Survey	
	% of Total	SQFT	% of Total	SQFT
Tier 1	2.85%	116,189	2.01%	80,883
Indoor	2.36%	96,155	1.52%	61,263
Outdoor	0.49%	20,034	0.49%	19,620
Tier 2	27.49%	1,121,089	21.25%	857,043
Indoor	15.72%	641,053	10.49%	422,890
Outdoor	11.77%	480,036	10.77%	434,153
Tier 3	69.66%	2,840,917	76.74%	3,094,748
Indoor	19.21%	783,245	19.59%	790,024
Outdoor	50.46%	2,057,672	57.15%	2,304,724
All		4,078,195		4,032,674

This data shows differences in the canopy observed year to year; however, a direct conclusion cannot be drawn from this table alone. Since each canopy survey is associated with an amount of licensed canopy, a difference in the number of surveys across the Tiers will affect the distribution of total observed canopy. Here, the increase in the percentage of total for Tier 3 partially reflects that slightly more Tier 3 producers were surveyed.



The next data series uses all of the previous figures combined with figures on the amount of licensed canopy to calculate the average canopy utilization for each of the subcategories. It also tests for a statistically significant difference between years one and two. The statistical test determines with 95% confidence if the averages for each year are different. If a subcategory fails this test, one cannot say with 95% confidence that a difference exists between the two years for that figure.

Average Canopy Utilization (Observed Canopy/Licensed Canopy) ²		
	2017 Survey	2018 Survey
Tier 1	41%*	44%*
Indoor	39%	43%
Outdoor	60%	47%
Tier 2	42%*	35%*
Indoor	39%*	29%*
Outdoor	46%	45%
Tier 3	37%	36%
Indoor	30%	28%
Outdoor	41%	40%
All	38%*	36%*

After applying the statistical test, there appear to be statistically significant differences between the two years overall and for a couple of subcategories. This means, that with 95% confidence, one can say that canopy utilization changed between year one and year two for the indicated categories. The raw difference overall is a decrease of 2%.

Due to differences between indoor and outdoor canopy spaces, the following chart uses an adjusted term for outdoor canopy to make a projection that attempts to account for the differences between indoor and outdoor canopy data.³

Canopy - Outdoor Adjusted				
	2017 Survey		2018 Survey	
	SQFT	Canopy Utilization	SQFT	Canopy Utilization
Indoor	1,520,452	34%	1,274,209	29%
Outdoor⁴	4,718,745	77%	5,624,510	83%
All	6,239,197	59%	5,810,743	52%

This projection increases canopy utilization because it assumes that all observed outdoor plants will reach average size. Even after this adjustment, canopy utilization does not exceed 60% of the licensed space.

² Statistically significant difference between years denoted with * (T-test 2-tailed equal variance not assumed, $H_0 \mu_{2017} = \mu_{2018}$, $\alpha = 0.05$, 95% Confidence, sample size for subcategories provided in chart on pg. 5).

³ Survey methods were the same for indoor and outdoor survey, but because outdoor canopy is often cropped only once a year, the physical size of outdoor canopy is much more sensitive to when it is observed.

⁴ Outdoor figures calculated using mean value of mature outdoor plants for each year (13.30, 10.97) multiplied by the number of outdoor plants observed. Values for greenhouse observations were not adjusted as these should not be as sensitive as outdoor values.

Licensee Conversation Themes

The initial report on the canopy project provided a summary of themes common to conversations between licensees and staff during the project. In preparation for this report, staff reviewed previous report's themes and compared to the year two field experiences.

Overall, staff reflected that these themes are still relevant:

Over-production – Staff continued to hear concerns about individuals exceeding their tier limit. The number of surveys in excess of their tier limit shrank from 48 to 21, but the perception that some licensees are not complying with canopy rules persisted.

Under Canopy – Some licensees expressed concern that the LCB may decrease their tier because they had failed to grow up to fifty percent of their production space designated as plant canopy on their operating plan.

Traceability System – Conversations about traceability were less common in year two of the survey. Common to most of these conversations were concerns about the stability of the platform, difficulty in use and expense of compliance with traceability rules.

Canopy Measurement – “How do you measure plant canopy?” was the most common question encountered by staff across both years of the survey. This is obviously a crucial question, because how plant canopy is described in rule has implications for determining if a premise complies with tier limits.

Market Access – Many producers expressed difficulty finding retail opportunities. Some producers indicated more optimism with respect to market prices in year two. This is also supported by traceability data. Average price per gram of a retail unit of usable marijuana sold post-excise tax appears to have remained stable from October, 2018 to November, 2019, which is an improvement from the general downward trajectory of prices since the market opened.

In addition to these themes, staff encountered new topics, such as hemp and vapor policies. These issues are complex and quickly changing. Conversations around these topics carried a common theme of a desire for regulatory stability.

All of these themes are familiar to the LCB as they have been raised previously in board meetings, through correspondence, and testimony. While familiar themes, it is still worthwhile to note them here since the canopy survey was a unique conduit for feedback.



Conclusion

The survey data indicates that from year one to year two, total observed canopy has remained flat while canopy utilization appears to have decreased. Licensing data shows a decrease of 75 marijuana producers during this period. These changes appear to indicate a modest shrinkage of observed marijuana canopy.

The experiences and observations of canopy project staff suggest that a uniform understanding of plant canopy measurement has yet to be achieved. This is not particularly uncommon in a landscape of regulation that continues to evolve. Other states also grapple with similar topics. Nevada and Massachusetts, as examples, have expanded their definition of plant canopy in an effort to address concerns and confusion they have experienced.

Further describing canopy measurement with a list of best practices designed to support compliance through LCB clarifying guidance or an interpretive statement could be considered as a means to assist agency and industry stakeholders in navigating the complexities and nuances of plant canopy.

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