



Whitney Economics WE can do it.

Test Changes and the Impact on the Oregon Cannabis Market
Results of a Survey by Whitney Economics
Beau R. Whitney
November 30, 2016

Highlights

- Supply constraints due to the changes in testing protocol in Oregon has significantly impacted the Oregon Cannabis industry
- On an annualized basis, black market activities have increased a projected \$187.5M due to the combination of higher prices and lower supply
- Oregon tax revenues are projected to decrease by a minimum of \$10.0M in Q4
- 22% of the 72 respondents indicated that they are going out of business and a large majority of survey participants plan to lay off employees for 1 – 3 months starting in Q4

Summary

A change in the testing certification, test limits and enhancement of a banned substances list for Oregon cannabis products by the Oregon Health Authority (OHA) has resulted in longer test throughput times, a lack of available supply of cannabis products in both the medical and adult use markets, job losses and economic hardship. In order to assess the impact on the market, Whitney Economics, in conjunction with the Oregon Cannabis Business Council (OCBC) conducted a survey of 683 cannabis businesses in Oregon during the period from 11/14/2016 to 11/30/2016 (Survey will close on 12/02/2016). There are 72 responses so far. This paper summarizes some preliminary survey results. This paper will also extrapolate from the data what the impact will be on the black market and Oregon state tax revenues.

Background

As part of the legislative session in 2016, Oregon cannabis regulators were legally mandated to make changes to the cannabis testing processes in Oregon. The legislative intent was to make testing of cannabis products standardized throughout the state by certifying laboratories, to define both medical adult use dosage limits for oils and edibles, and to also provide greater clarity on what substances can and cannot be used in the production of cannabis plants during cultivation. The regulatory responsibilities were divided up between essentially three state agencies. The Oregon Liquor Control Commission (OLCC) was to develop rules and regulations associated with licensing, deployment and management of the retail “Adult use” program, The Oregon Department of Agriculture (ODA) was mandated to manage the farms associated with the cultivation of cannabis, and the Oregon Health Authority (OHA) was mandated in part to deploy rules and regulations associated with dosage limits for medical and recreational users, manage the certification of the laboratories and establishing of test limits associated with pesticides, hydro carbons and other potentially harmful substances contained in the cannabis products.



Whitney Economics WE can do it.

October 1, 2016 was a defining moment in the Oregon Cannabis Industry. It was the target date for the deployment of the retail program and was a date mandated by the legislature to have more enhanced testing requirements, including, but not limited to laboratory standardization and certification as well as a more extensive list of banned substances and testing thresholds. Many businesses involved in the medical industry tried to time the market, in order to convert over into the more lucrative adult use system. The decision came down to two critical factors, how many laboratories would be certified by 10/01 and how many suppliers were converted into the adult use space. Laboratories play a key role in the industry, because they provide testing services for both the medical and adult use markets.

As October 1st, came near, the OHA published a series of notifications to the cannabis community outlining expectations. Unfortunately for some, the more enhanced testing limits came months after plants were put into the ground and nutrients and pesticides had been applied. Businesses in the retail, processing and other derivative spaces took a cautious approach to 10/01 given the uncertainty in the regulatory environment. Some businesses stock piled product to carry them through the end of the year, others pared down their inventories, unsure of what would be allowed to be sold through after the 10/01 changes took effect. A lot of businesses were waiting to see how many laboratories would be certified by 10/01 and how many suppliers would be converted over from the medical market and into the adult use market.

On 10/01, very few laboratories were fully certified by the state regulatory bodies, so as a result every medical and adult use business had to use the certified labs in order to bring post 10/01 product to the market. This created a bottleneck in the supply chain and as a result product availability was constrained. Test throughput, originally modeled by regulatory policy analysts to average 5 days, actually ended up being in the range of 14-21 days making products scarce. To make things worse, the expanded testing criteria resulted in more failed tests. Product that was compliant on 09/30/2016, was now failing in large numbers for pesticides and other banned substances, as the thresholds for failure were tightened significantly. Although official failure percentages are not available at this time, based on inputs from the laboratories themselves indicate that between 40% and 60% of all submissions failed the enhanced testing standards. (Although governmental officials claim it is closer to 20%-30%)

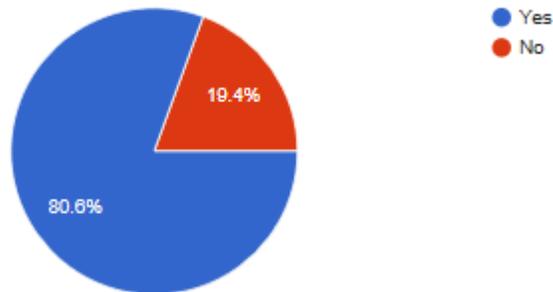
Given the perfect storm of a bottleneck at test, increased throughput times and a high percentage of test failures, the legal Oregon cannabis market is highly constrained for supply. This is impacting the entire Oregon cannabis industry. Whitney Economics, looked into this topic and conducted a survey of industry businesses sending over 680 cannabis businesses and a total of 72 responses were submitted. The summary below highlights some of the key inputs from the survey participants.



Whitney Economics WE can do it.

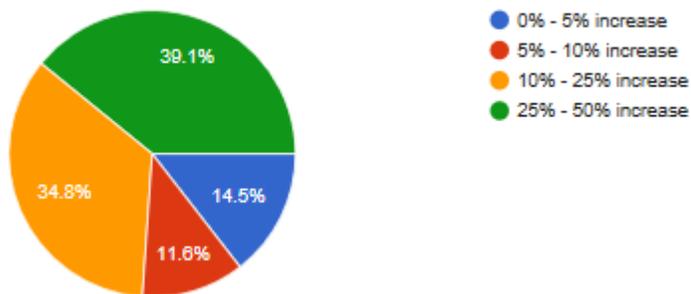
1) When asked if businesses are experiencing supply constraints, 80% of respondents answered yes

Are you experiencing any supply constraints? (72 responses)



2) When asked about whether the businesses are seeing price increases due to the lack of available supply, 39.1% responded that prices have increased 25% - 50%.

Are you seeing pricing increase due to this constraint? (69 responses)

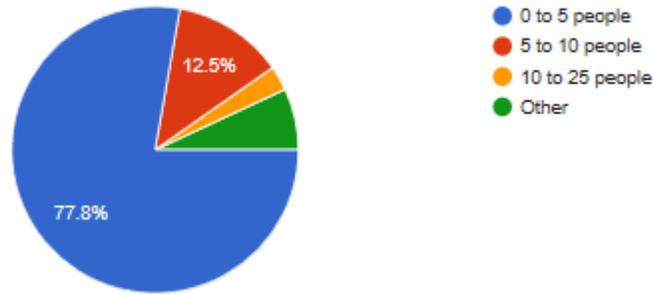


3) The supply constraints are resulting in some layoffs. Some businesses are closing up shop. 11 out of 72 respondents submitted that they plan to lay off between 5 and 25 employees.



Whitney Economics WE can do it.

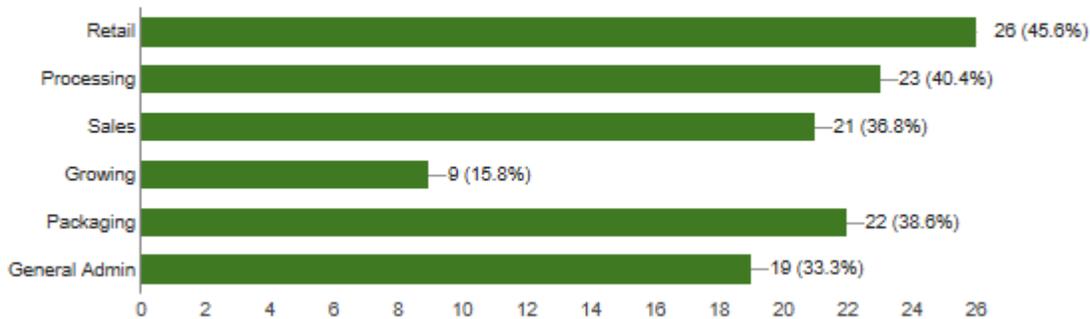
How many people do you plan to lay off? (72 responses)



4) The potential layoffs are widespread in terms of functional areas.

Which department(s) did you lay off employees (check all that apply)?

(57 responses)



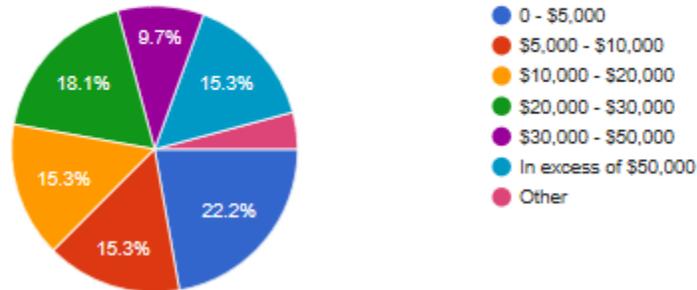
5) Many, but not all businesses have started to experience lost revenues as a result of this supply constraint. One business specifically stated that in October alone, revenues have decreased by over \$300,000 another indicated qualitatively that they are forecasting a \$400k decrease in Q4 revenue.



Whitney Economics WE can do it.

How much lost revenue (Average per MONTH) have you experienced as a result of the changes in testing?

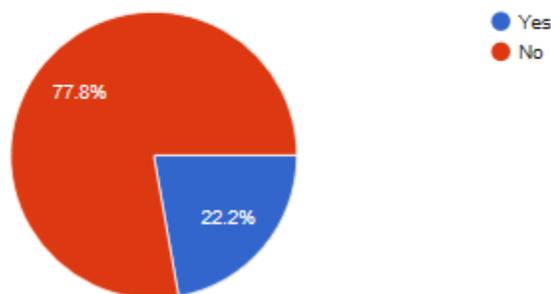
(72 responses)



6) For some the economic impact is too much to overcome. 16 out of 72 respondents said that they are going out of business.

Is your business shutting down because a regulatory agency applied new regulations to a crop you already grew in reliance on previous rules and guidelines?

(72 responses)



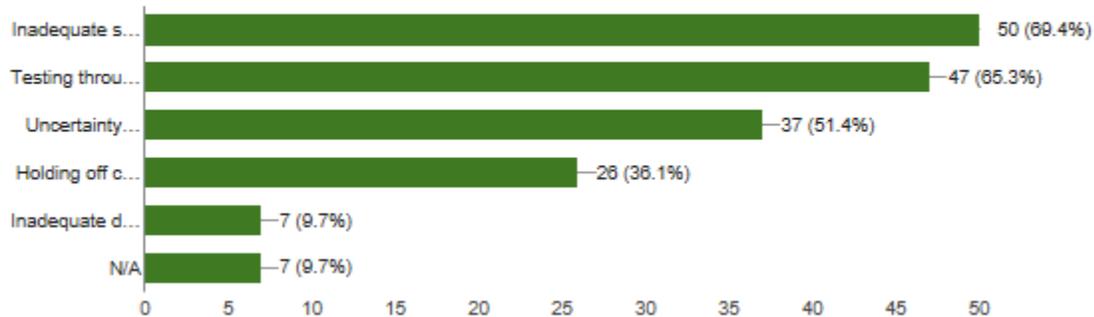
7) When asked about what main issues are impacting the cannabis businesses the most, Inadequate supply, testing throughput time and regulatory uncertainty topped the list.



Whitney Economics WE can do it.

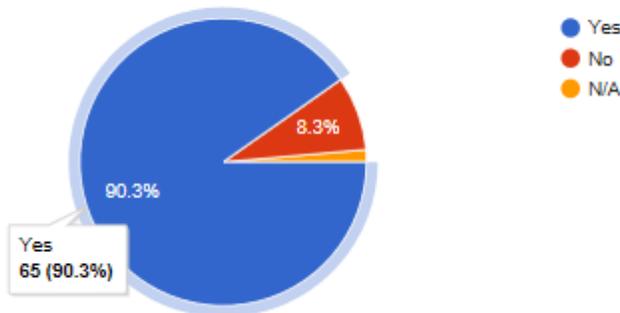
What specific aspect of this testing and supply issue is impacting your business?

(72 responses)



8) By an overwhelming number, this is the industry's top issue that they are facing.

Is this your MOST important issue for your business? (72 responses)

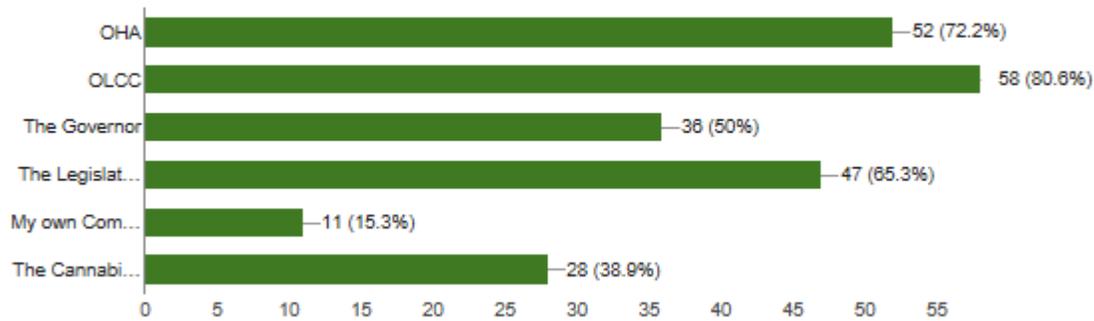


9) Based on inputs from the industry, although the OHA is in charge of this specific issue, the blame game is pretty wide spread and is often misplaced. For example, the OLCC does not control any aspect of setting testing standards or failure limits. By law, testing and limits are the responsibility of the Oregon Health Authority (OHA).



Whitney Economics WE can do it.

Who is responsible to resolve this issue? (72 responses)



What can we extrapolate from this data?

Black Market

Based on the survey results, prices are increasing significantly, in some cases 25% - 50% higher than in September. In previous economic white papers, Whitney Economics has calculated how sensitive consumers are to price increases. As the pricing differential expands between the black market and the retail price, more consumers will go back to the black market suppliers. Elasticity of demand is slightly above 2, with a price increase of 25%, one would expect to see a demand decrease of 50%. This is supported by the survey results. The decreased demand in the regulated market will transfer back to the black market.

How much of an increase will Oregon expect to see in the black market?

Whitney Economics has previously forecasted that 50% of the current \$750M/year Oregon Cannabis market is black market. The combination of increased prices and supply constraints in the current regulated market, black market activity in Oregon is expected to increase from 50% of the market to 75% of the market in the near term. This is supported both in theory, in the survey results and in the projected tax revenues for the state. Assuming the respondents are a representative sample of the industry, on an annualized basis, the testing constraint and pricing increases have increased black market activities by \$187.5M per year.

The Tax impact

Respondents to the survey indicated that cannabis revenue has been reduced by 50% due to lack of supply and increased pricing. Qualitative inputs indicate that the reductions in revenues are accelerating in November as inventories from the pre 10/01 testing stocks are depleted. Based on data provided by the Oregon Department of Revenue, the total cannabis tax revenues in Q3 were \$19.54M on sales of \$78.16M. Therefore, if Q4 sales would have mirrored Q3, a 50% reduction in sales will result in a



Whitney Economics WE can do it.

reduction in taxes for the state of Oregon by \$10.0M in Q4. This is a conservative estimate, as the sales are expected to decline further throughout Q4 due to lack of product availability.

Conclusion

The changes that were made effective on 10/01/16, have had a profound impact on the Oregon cannabis market. Although public safety is of paramount importance, the deployment of the test changes have resulted in higher prices, less supply, job losses and economic hardships. Higher prices and reduced supply will only stoke the ever present black market and generate results contrary to the legislative intent. Some would say that this policy deployment is actually creating greater public safety issues than what the OHA was trying to prevent. The industry is calling for reform and the data from this survey confirm that this is a major issue that is threatening the industry and is stifling the growth of the nascent emerging industry. The Oregon industry is in crisis.

About the Author

- Beau R. Whitney is an economist, a university professor and is the former COO of Golden Leaf Holdings, a vertically integrated, publically traded company.
- Prior to working in the cannabis industry, Beau spent 15 years in the high tech industry in business operations roles, most notably at Intel and TriQuint Semiconductor.
- Beau has published a series of white papers on the cannabis market in the USA and is considered an authority in cannabis economics
- Beau recently presented a paper at the 91st annual Western Economics Association International conference on Economics role in shaping public policy and was recognized by his peers as being a pioneer in this field of study

About The Oregon Cannabis Business Council

- The Oregon Cannabis Business Council (OCBC) is a member-driven trade association.
- The OCBC provides professional assistance to post-cultivation cannabis businesses and representation for in-state legislative and regulatory decision making.
- Their membership includes Producers, processors, wholesalers and retailers

<https://oregoncbc.com/>

Special thanks to the high tech web development firm Click Simply for their support of the on-line survey.

<https://clicksimply.com/>