



2023

Recreational Marijuana Supply and Demand Legislative Report

Oregon Liquor and Cannabis Commission

February 1, 2023

Executive Summary

This is the fourth biennial Supply and Demand Report for Oregon's Recreational Marijuana market – a market that has exhibited a see-saw pattern of oversupply and market correction. Previous market cycles have been buoyed by large annual increases in consumer demand, and Oregon's recreational marijuana market has successfully transitioned most in-state consumers to the legal market. However, the Oregon recreational marijuana market is in arguably the weakest economic position it has been in since the inception of the program in 2016 due to a decrease in the growth of demand in Oregon, a production cycle that responds to market signals on a lag, and increasing stockpiles of inventory.

Following the banner sales year of 2020, OLCC Producers entered 2021 exuberant and optimistic about the future of the market – and made their planting decisions accordingly. However, the fading of demand as 2021 progressed, exacerbated by a record outdoor harvest in October 2021, set off a slide in prices that put the entirety of the supply chain under pressure in 2022.

The overabundance of supply throughout 2021 and 2022 resulted in historically low wholesale and retail prices for both usable marijuana and concentrate/extract products. The declining prices, in combination with a tempering in the growth of quantities purchased, resulted in the first-ever decrease in annual sales (from \$1.2 billion in 2021 to \$994 million in 2022).

The OLCC estimates that market demand was 52% of supply in 2021, and 63% in 2022. The fact that 2022 was closer to supply/demand equilibrium than 2021 stands in contrast to the deteriorating market conditions. On the one hand, the fact that supply was closer to demand is a reflection of the decrease in annual production by OLCC Producers in 2022, a self-correction in the market that offers a glimmer of hope for 2023. On the other hand, the declining wholesale and retail prices for usable marijuana are due to large stocks of usable marijuana inventory leftover from previous years, which is likely to continue to put downward pressure on prices.

Market dynamics on the demand side also point to a turbulent 2023. Overall, consumer demand since 2021 has been at lower rate than prior years, and there has been a notable shift down in the demand trend line. Moreover, the distribution of demand is shifting away from usable marijuana – both as an intermediate and final product. In previous years, OLCC Processors have proven to be a “safety net” for Producers by purchasing large amounts of usable marijuana and giving Producers an additional outlet for their product. However, just like usable marijuana inventory, stocks of concentrate and extract products are at all-time highs and Processors are less likely than in the past to turn to Producers for new inventory. This also comes at a time when consumers are shifting towards other product types (particularly edibles) and away from usable marijuana. These factors all point in the same direction: fewer outlets for usable marijuana, and lower prices for licensees.

Oregon's recreational marijuana market has proven resilient, but until the federal legal landscape changes, two fundamental facts remain unchanged: in-state supply is boundless, while in-state demand can only grow so much. Oregon's extremely competitive marketplace features low prices for consumers that have positioned the state's legal market to compete successfully with the illicit market. The corollary, however, is that these low consumer prices force businesses to operate under low margins and extreme pressure. The narrowness of those margins, and the ability for Oregon cannabis businesses to operate under them, remains to be seen as we enter 2023.

Introduction

Pursuant to ORS 475C.529, by February 1 of each odd-numbered year the Oregon Liquor and Cannabis Commission (OLCC), which licenses and regulates the production and sales of recreational marijuana in Oregon, must submit a report to the Legislative Assembly on the following:

the approximate amount of marijuana produced by marijuana producers that hold a license issued under ORS 475C.065 and the approximate amount of marijuana items sold by marijuana retailers that hold a license issued under ORS 475C.097, and whether the supply of marijuana in this state is commensurate with the demand for marijuana items in this state.

This is the fourth biennial Supply and Demand Report for Oregon's Recreational Marijuana market – a market that has exhibited a see-saw pattern of oversupply and market correction. Previous market cycles have been buoyed by large annual increases in consumer demand, and Oregon's recreational marijuana market has successfully transitioned most in-state consumers to the legal market. However, with a decrease in the growth of demand in Oregon, a production cycle that responds to market signals on a lag, and increasing stockpiles of inventory, the Oregon recreational marijuana market is in arguably the weakest economic position it has been in since the inception of the program in 2016.

What lies in store for 2023 remains to be seen. On the one hand, production declines in 2022 (namely the substantial drop-off in year-over-year harvests in October) temper the flow of new supply into next year's market. On the other hand, however, stocks of inventory have accumulated as annual supply has routinely exceeded annual demand, and there are simply fewer outlets for Recreational Marijuana Producers' crop.

Summary of Previous Reports

The previous Supply and Demand Reports have painted a picture of a growing and resilient market.

The [2017 report](#), although unable to make firm estimates of supply and demand equilibrium due to the market having just launched,¹ observed that in just the first three months of the market, sales had reached more than \$10 million. The recreational market had seen its first outdoor harvest in October 2016 and the full supply chain was in place.

Two years later, the [2019 report](#) found that during the study period (July 2017 to June 2018), market supply was double market demand and that there were considerable stockpiles of inventory accumulating in the system (much of it brought into the system when businesses transitioned from the Oregon Medical Marijuana Program to the OLCC recreational system). Despite this market reality, however, businesses continued to apply for marijuana licenses and existing businesses continued to attract investment capital. Prices had begun to decrease considerably (from \$10 per gram of usable marijuana in October 2016 to \$5 per gram in December 2018), but the increase in the *quantity* of marijuana purchased meant that total sales in dollar terms (and thereby tax revenues for the state) continued to grow. The findings of the 2019 report are a product of two primary factors that continue to characterize the Oregon recreational marijuana market: first, exuberance on the part of both consumers

¹ The first Recreational Marijuana Retailers were licensed in October 2016, with many businesses waiting until December 2016 (the end of the "Early Start" program) to transition from the medical market to the recreational market.

and businesses, and second, the difficult market environment created by federal marijuana prohibition in a state where marijuana grows exceedingly well.

The [2021 report](#) noted a significant improvement in the outlook for Oregon recreational marijuana businesses, primarily due to the spike in demand caused by the COVID pandemic in 2020 that resulted in annual demand in 2020 accounting for 65% of annual supply. However, despite this improvement in market conditions, the report also warned that the market continued to face potential headwinds, particularly if COVID-induced growth in demand slowed or receded. The report concluded with an open question:

With the prospect of increasing supply, flattening growth in demand, and a large pre-existing baseline of extract/concentrate inventory, it is unclear how long the market's healthy balance will continue to play out. If supply in late 2021 increases above what the usable marijuana market channel can sustain, will Processors continue to operate as a "safety net" for Producers? Or will Processors, with ample inventory of processed items and the prospect of flattening consumer demand, start turning Producers away? If this latter scenario were to happen, then a deterioration of Producers' wholesale prices across the board would risk sending the market back into the late-2017 price spiral.

In January 2023, it is clear that this latter scenario has indeed come to pass. Both average wholesale and retail prices for usable marijuana declined steeply between December 2020 and December 2022 (by 60% and 25%, respectively), and as of December 2022 are at their lowest-ever points. Declining retail prices are a positive for consumers, and can induce both a transition from the illicit to legal market as well as larger quantities of purchase. In fact, it was this dynamic (in which the quantity of products sold increased more than prices declined) that resulted in the continuing growth of the market in 2018 in spite of spiraling prices. However, heading into 2023, quantities of purchase have been insufficient to buoy the market in the face of decreasing prices, and the Oregon recreational marijuana market has now seen its first-ever decline in annual total sales.

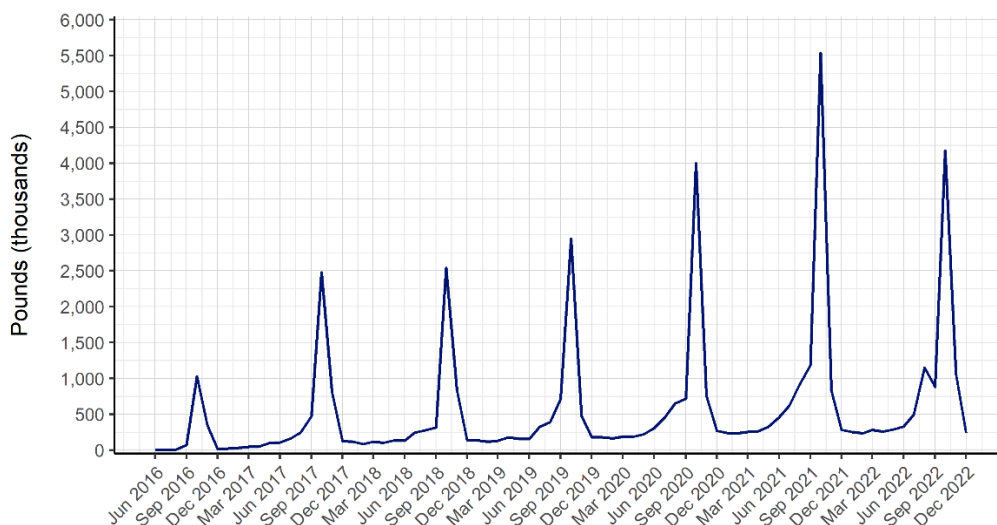
This report evaluates the health of the recreational marijuana market as of January 2023 and the factors that will determine the degree to which the market is able to rebound in the near-future.

Summary of 2023 Market Conditions

In many ways, the last two years of the Oregon recreational marijuana market have existed in the shadow of the COVID pandemic. Following the banner sales year of 2020, Recreational Producers entered 2021 exuberant and optimistic about the future of the market – and made their planting decisions accordingly. However, the fading of demand as 2021 progressed, exacerbated by a record-breaking outdoor harvest in October 2021, set off a slide in prices that put the entirety of the supply chain under pressure in 2022.

The 2022 harvest (particularly the fall outdoor harvest aka "Croptober") represented a self-correction to market conditions, declining year-over-year for the first time ever (by 13% for the year, and an astonishing 25% in October). As discussed in more detail below, this decline in supply does set the stage for an improved 2023, but significant warning signs remain.

Figure 1: Wet Weight Harvested (pounds) by Month



The overabundance of supply throughout 2021 and 2022 resulted in historically low wholesale and retail prices for both usable marijuana and concentrate/extract products. Wholesale prices for concentrates and extracts have been remarkably stable for the past several years (December 2022 wholesale prices are identical to what they were in December 2018), but usable marijuana exhibited a steep drop in 2022 after having bounced back in 2020 and early 2021. Retail prices per gram of both concentrates/extracts and usable marijuana have declined, but to a greater extent for usable marijuana (concentrates/extracts were lower by 20% in December 2022 compared to the peak in October 2020, and usable declined by 28% over the same period).

Figure 2: Median Wholesale Price per Pound for Concentrate and Extract Products, by Month

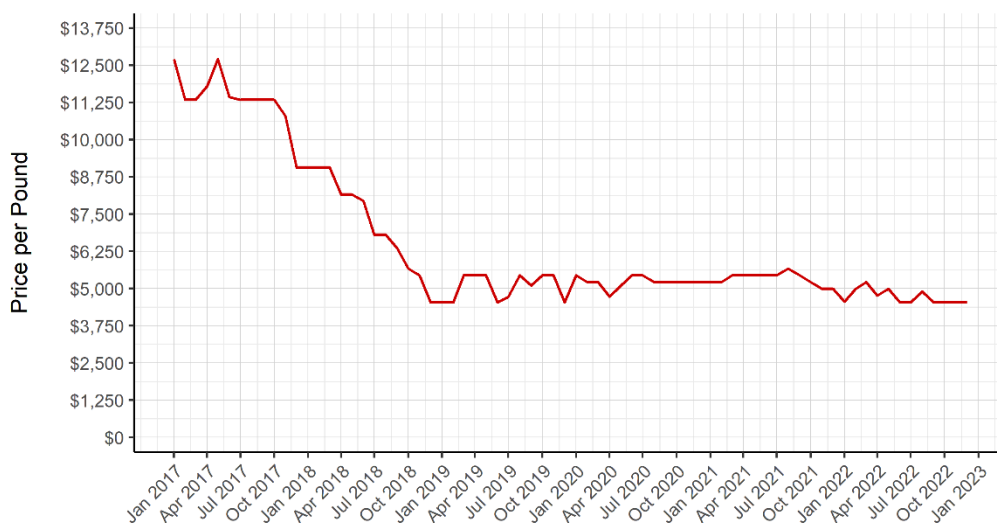


Figure 3: Median Retail Price per Gram for Concentrate and Extract Products, by Month

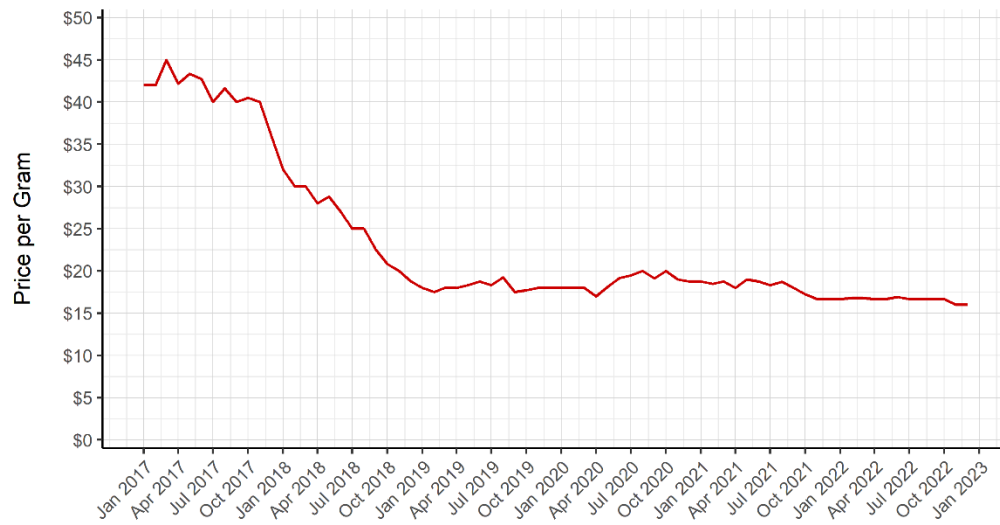


Figure 4: Median Wholesale Price per Pound for Usable Marijuana, by Month

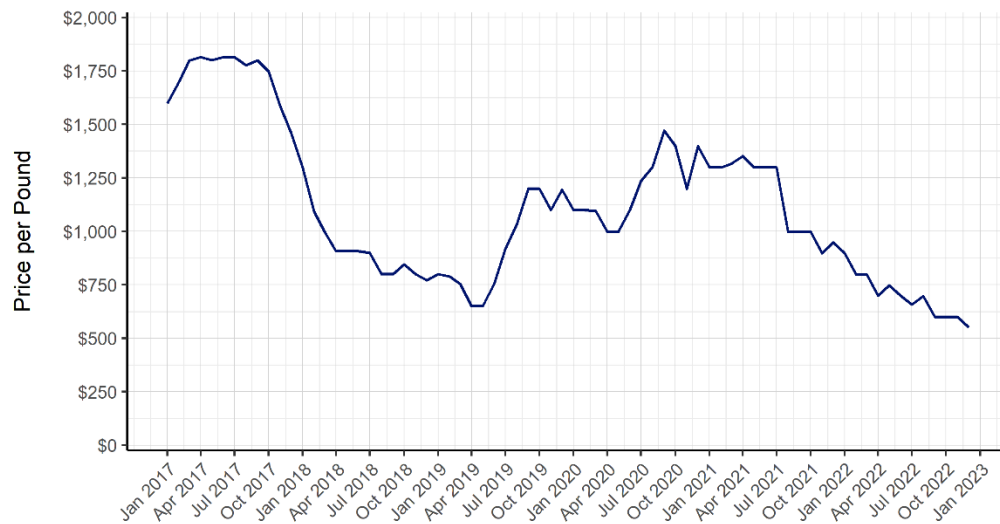
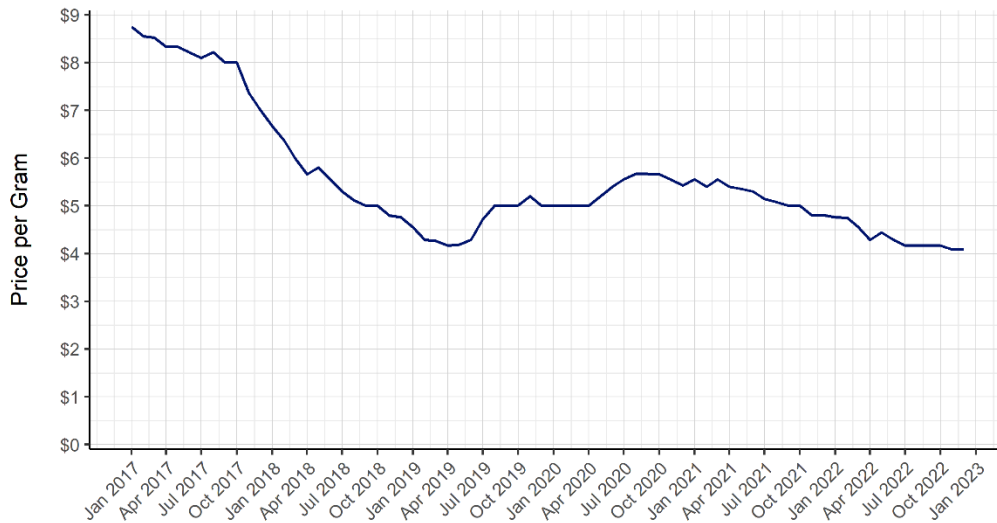
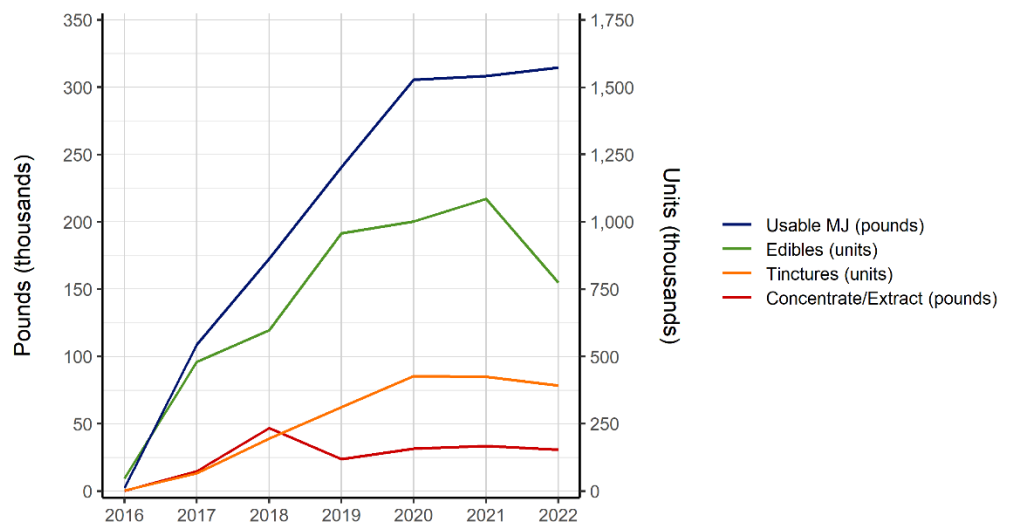


Figure 5: Median Retail Price per Gram for Usable Marijuana, by Month



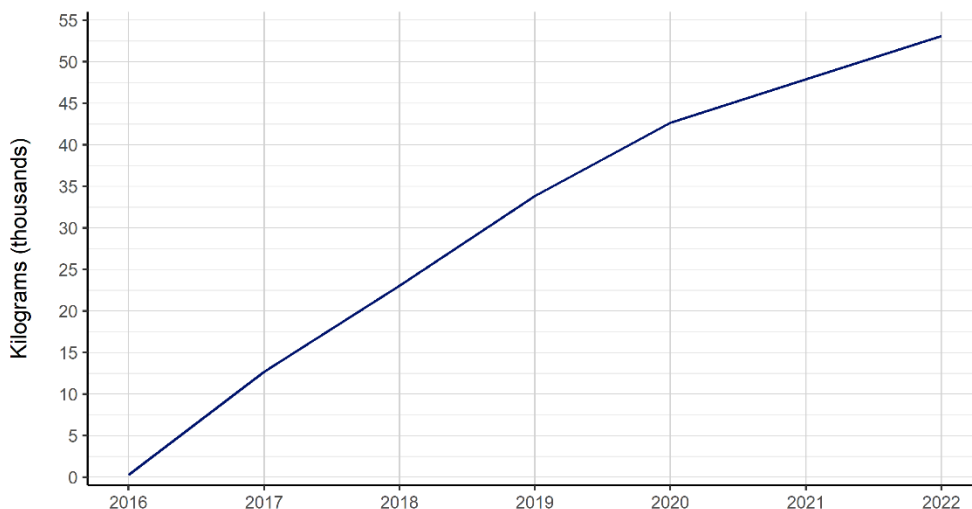
The trend in *quantities* sold is more of a mixed bag. The total quantity sold of usable marijuana increased in both 2021 and 2022, but at a fairly tepid rate – by 2% in 2022 (and 1% in 2021), compared to a growth rate of 27% in 2020. The quantity sold of concentrates/extracts, edibles, and tinctures, on the other hand, declined in 2022. Because of the diversity of products in the market, it is difficult to do an apples-to-apples comparison of quantities sold from one year to the next. For example, usable marijuana may have increased in sales and concentrates/extracts *decreased*, but what does that mean for quantity of marijuana as a whole? Moreover, policy changes can affect the interpretation of the data. Most specifically, concentration limits for edibles doubled in 2022 due to legislative change – thus, while the number of units sold declined between 2021 and 2022, each of these units was more potent on average and therefore would have required more marijuana to produce.

Figure 6: Quantity Purchased (Pounds and Units) by Product Type, by Year



To address this complexity and to better make apples-to-apples comparisons, Figure 7 graphs the quantity sold in term of the aggregate amount of THC sold, regardless of product type. Standardizing the quantity of sales to a single unit (THC) more clearly visualizes the flattening of demand growth referenced above. Whereas prior years saw a consistent linear increase in the total amount of THC sold in the recreational marijuana market, the trend line flattens noticeably in 2021 and 2022. In 2020, the year-over-year increase in THC sold was 26%, but declined in 2021 and 2022 to rates of growth of 12% and 11%, respectively.

Figure 7: Quantity of THC Purchased, by Year



Despite the increase in quantities purchased, the decrease in prices throughout 2022 led to the first-ever decline in annual sales in the Oregon recreational marijuana market. Sales in 2020 totaled \$1.1 billion, increasing modestly to \$1.2 billion in 2021, before decreasing to \$994 million. The downward trajectory of sales can be seen in both Figure 8 and Figure 9. Monthly sales last peaked in April 2021, and each consecutive month since August 2021 has seen a year-over-year decline.

Figure 8: Marijuana Sales by Month

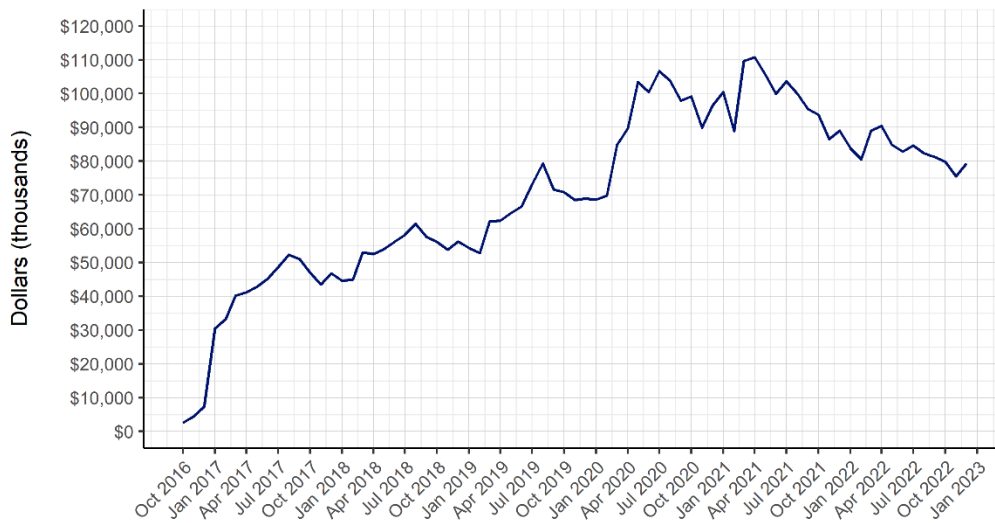
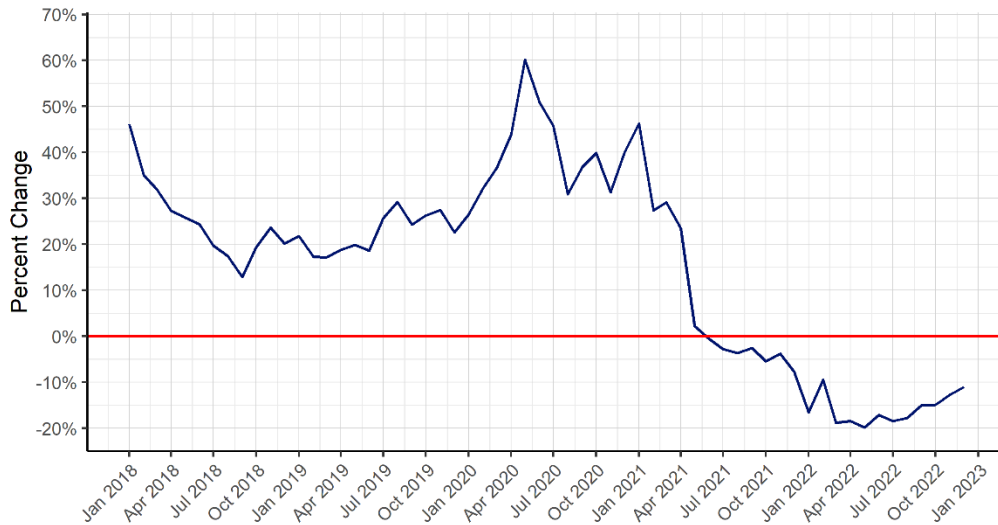
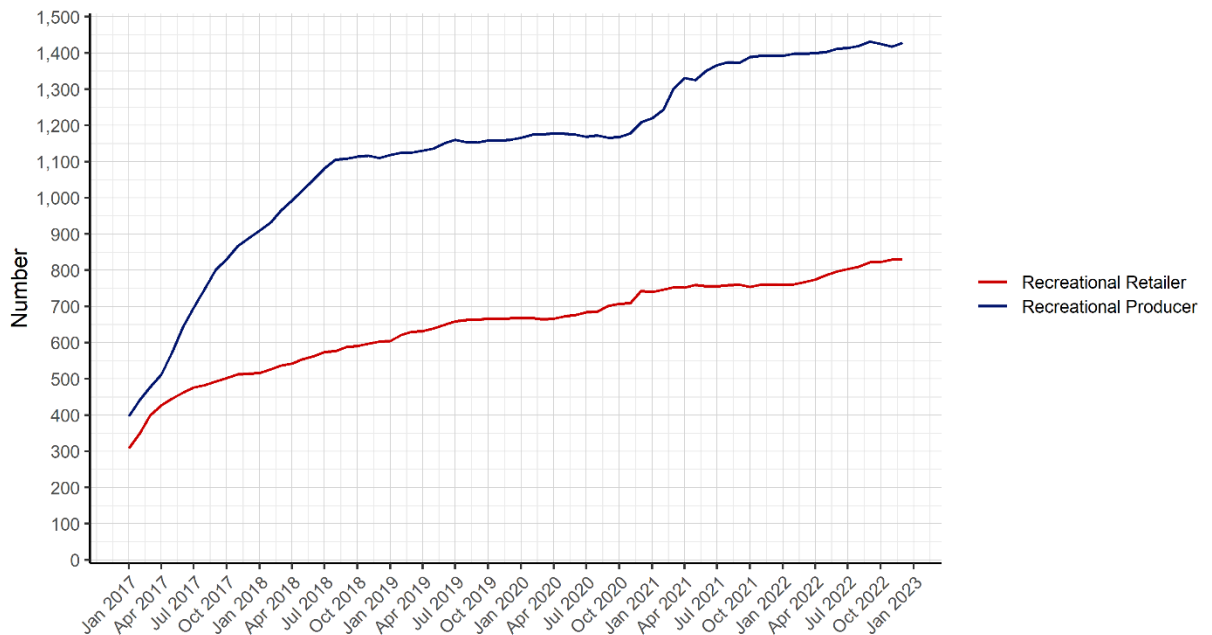


Figure 9: Year-Over-Year Percentage Change in Sales, by Month



The abundant supply in 2021 and the declining prices throughout 2022 placed marijuana businesses under severe strain. Despite the economic conditions, businesses continued to enter the marijuana market, with the number of active Producers and Retailers now at their highest-ever levels. Although the Legislature placed a moratorium on the issuance of new licenses (first on Producers, then extending it to Processors, Wholesalers, and Retailers), there were a considerable number of applications that were submitted prior to the moratoria deadlines and therefore eligible for approval in 2022 – many submitting their applications as far back as June 2018.

Figure 10: Number of Issued Licenses, by Type and Month



However, while the number of issued licenses continues to rise, the share of licensed businesses that are actually operating continues to decline. Figure 11 shows this trend by month, and measures the percentage of Retailers that did not record a sale in a given month and the percentage of Producers that did not record a harvest. Three notable trends emerge from this graph. First is the “Coptober” spike in outdoor Producers harvesting their annual crop, with most Producers being “dormant” (from a harvest perspective) for most of the year and then harvesting in October. Second, the reason for the significantly smaller October 2022 harvest yields is apparent – far fewer producers actually grew and harvested a crop, despite being an active license. Finally, as retail prices continued to decline and competition between Retailers increased, the percentage of Retailers open for business also declined.

Figure 11: Share of Producers with Harvests and Retailers with Sales, by Month

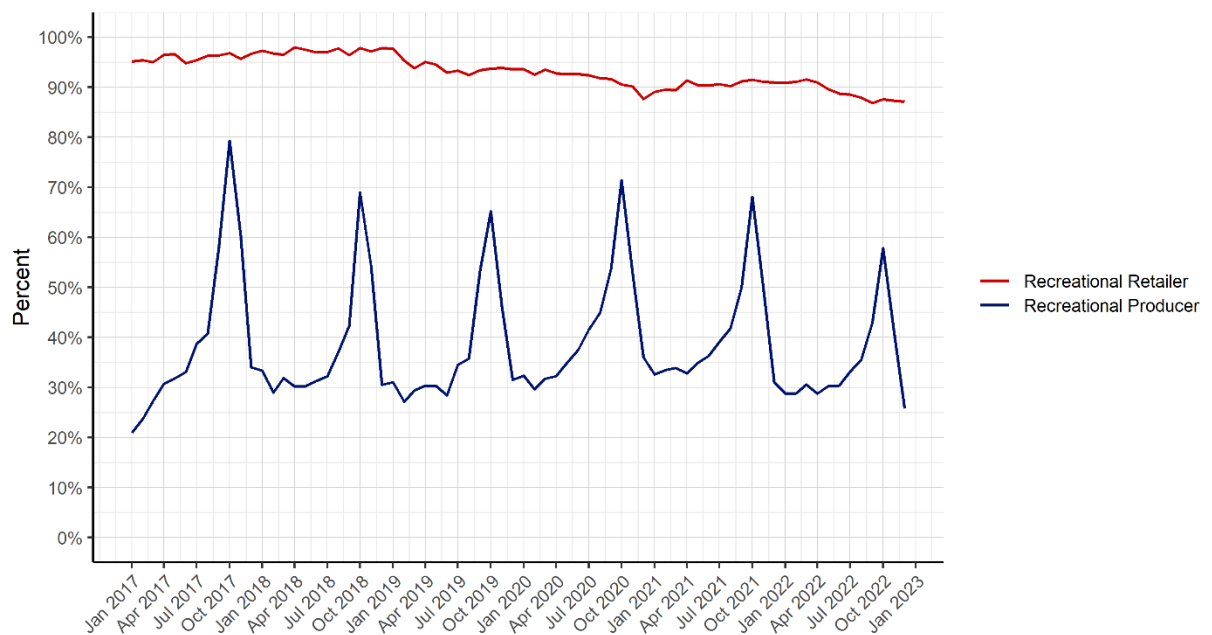
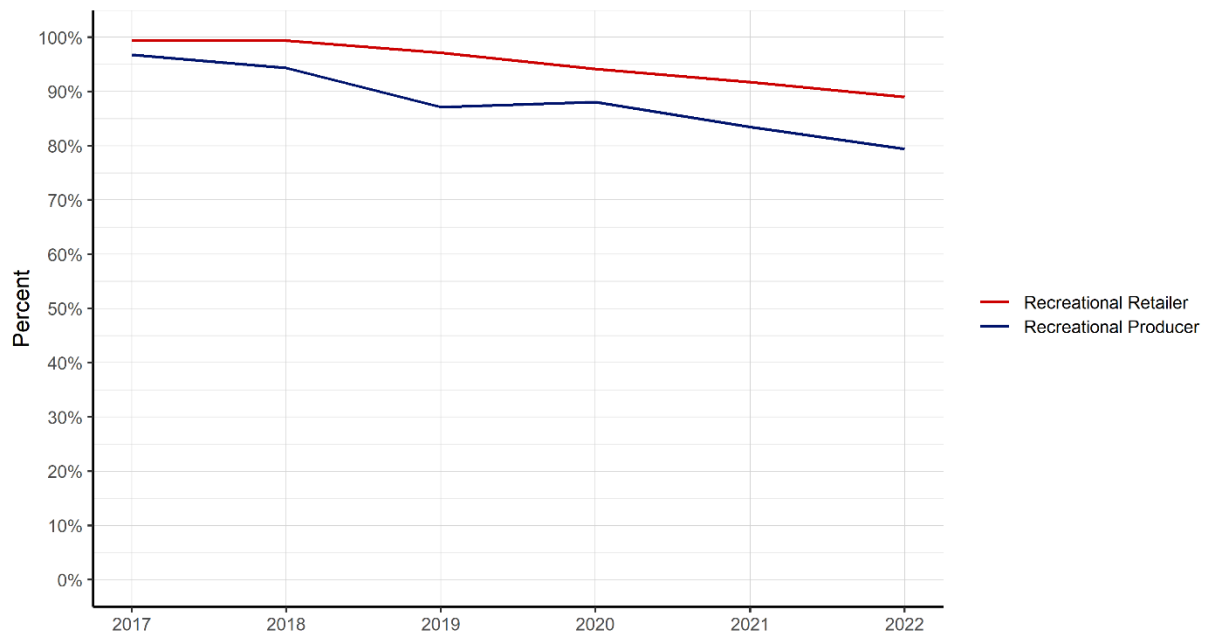


Figure 12 displays similar data, but in a slightly different way. Rather than looking exclusively at harvests, Figure 12 looks at whether a Producer harvested *or* transferred product into the supply chain (under the assumption that some Producers may not have harvested a crop in some or all of 2022, but may still have been selling back stock inventory into the market). The second difference is that the graph includes the percentage of Producers and Retailers operating at any point in a year, not just in a single month. These two figures, while measuring data with slight differences, tell a similar story: although the number of issued licenses continues to increase, the number of businesses actually operating continues to decline. This decline is likely a cause of the decrease in the 2022 harvest, and an effect of the 2021 harvest glut.

Figure 12: Share of Producers with Harvests or Outgoing Transfers and Retailers with Sales, by Year



Estimate of Supply and Demand Ratio

Using the methodology developed in the 2019 version of this report, the OLCC estimates that the wet weight equivalent of demand was 63% of actual annual supply in 2022, and was 52% in 2021 (see Figure 13 and Figure 14).

Figure 13: Estimates of Annual 2021 Demand Relative to 2021 Supply

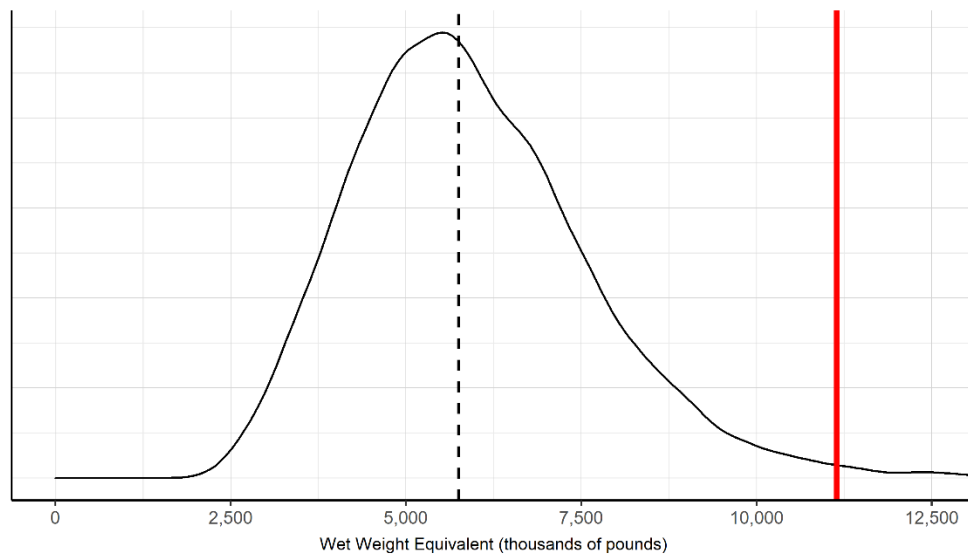
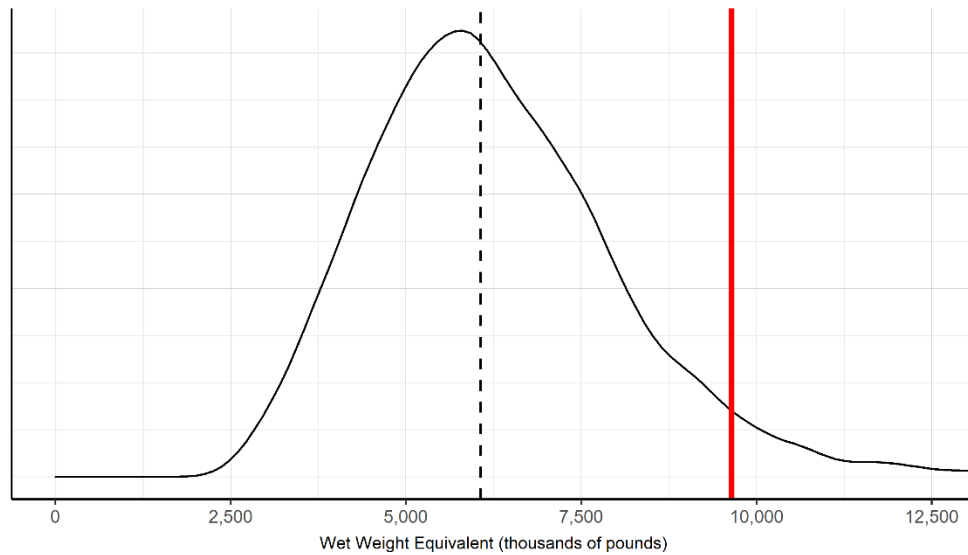


Figure 14: Estimates of Annual 2022 Demand Relative to 2022 Supply



* red line in each graph represents the actual wet weight harvest in the respective year; dotted lines represent the estimated wet weight equivalent of annual demand

Put in context, this estimate means that annual supply in 2021 was on par with the turbulent July 2017 – June 2018 supply environment, whereas 2022 was closer to the much stronger 2020 market.

Why, then, were market conditions notably worse in 2022 than in 2020? The answer appears to be twofold.

First, although October represents by far the largest share of annual harvest, much of the outdoor crop typically does not come to market until the following calendar year. In that sense, the large drop-off in October 2022 compared to October 2021 may not yet be “priced in” to the market.

Table 1 quantifies this lagged effect. Rather than compare calendar year harvest to calendar year supply, the table instead compares calendar year demand to lagged (October through September) annual harvest. Compared to the above estimates, the market conditions actually improve in 2021 (increasing from 52% estimated demand-to-supply ratio to 60%), and conditions deteriorate in 2022 (moving from an estimate of 63% based on calendar year to 55%). These shifts reflect a change in when the respective October harvests are accounted for, with the October 2021 spike being used as the supply estimate in the calendar 2022 year.

Table 1 also attempts to forecast what the decline in the October 2022 harvest may mean for 2023. Assuming an increase in demand on par with the 2021 and 2022 periods (i.e. a 10% annual increase in the amount of THC purchased), the 2023 supply/demand ratio may increase to as much as 68%. This, however, should be seen as closer to a *best case* scenario, as the estimate assumes linear growth in demand but assumes no increase in the January to September 2023 harvest amounts.

Table 1: 2023 Forecast of Demand vs. Supply

Period	Estimated Demand to Supply Ratio
October 2020 - September 2021 Harvest, CY 2021 Demand	60%
October 2021 - September 2022 Harvest, CY 2022 Demand	55%
October 2022 – (projected) September 2023 Harvest, (projected) CY 2023 Demand	68%

The second, more worrying factor, for why market conditions continued to deteriorate in 2022 despite a decline in supply is that inventory stockpiles in the system may be blunting the effect that the lower annual supply would have had. In other words, while the *flow* of annual supply self-corrected, the *stock* of pre-existing supply may be keeping prices (and profits) low. This second factor is discussed in more detail below.

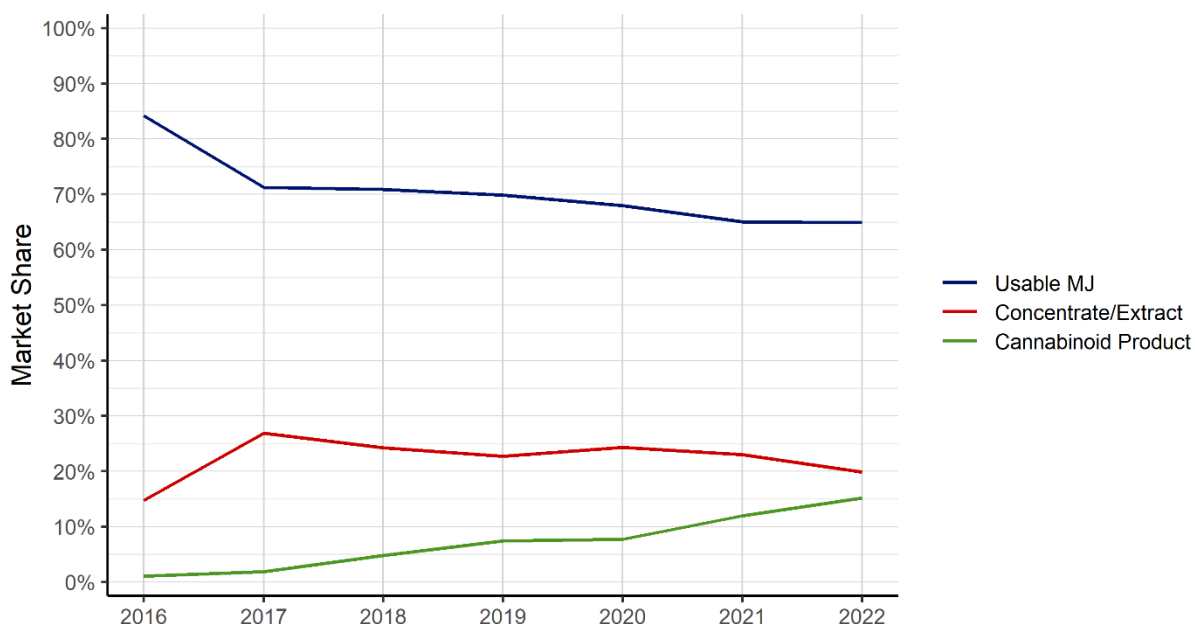
Market Conditions Moving Forward

There are some positive signs of improved (or at least, less bad) market health heading into 2023. Although Figure 9 above still exhibits negative year-over-year growth in sales for every month of 2022, sales have been declining at a lower rate since May 2022 (increasing from -20% year-over-year growth in May to -11% in December). The decline in retail prices is less steep, and sales in products such as edibles remain relatively strong (the edible/tincture category actually increased in dollar terms – albeit by only 0.2% – in 2022). Moreover, as discussed above, the significant decline in the October 2022 harvest compared to the October 2021 harvest puts the market on a better trajectory heading into the new year.

However, while 2023 may prove to be an improvement over the 2022 market conditions, it will almost certainly not be an improvement over 2020 – and may very well be weaker than 2021, as well. The difficulties ahead are likely to be particularly acute for Producers, as consumers continue a long-term shift towards processed goods, and as inventory stock of both usable marijuana and concentrate/extract products are at all-time highs.

As Figure 15 shows, the market share of usable marijuana (relative to the total amount of THC purchased) has declined each successive year since the market opened in 2016. Cannabinoid products (e.g. edibles and tinctures) continue to ascend.

Figure 15: Market Share of Aggregate THC Purchased, by Product Type and Year



This declining market share comes at a time when usable marijuana inventories are at all-time highs, across all license types. The inventory on-hand at licensed Producers on January 1, 2023, was more than double what it was on January 1, 2020, and more than 50% of its levels on January 1, 2021. This comes in spite of a significant decline in annual harvests between 2021 and 2022, underscoring the degree to which the 2021 harvest exceeded market demand. Usable marijuana inventory levels remain high at Processor and Wholesaler locations as well. Anecdotally, much of the inventory growth at Wholesalers may be attributed to “orphaned” product, in which Wholesalers hold contracts with Producers that have lost or given up their license and are therefore unable to dispense with the product. However, the high levels of inventory at active Producers and Processors indicate that, even in the absence of Wholesaler inventory, there are ample reserves of usable marijuana as both a final product and as input material to concentrate and extract processing.

Perhaps more concerning for Producers, stockpiles of concentrates and extracts also continue to grow (see Figure 17). As the 2021 version of the Supply and Demand Report discussed, Processors have historically proven to be a “safety net” for Producers, particularly following the market glut of 2017 and early 2018, by purchasing large amounts of usable marijuana and giving Producers an additional outlet for their product. However, with ample stock already on hand, Processors seem less likely to purchase usable marijuana for input material on a go-forward basis than in previous years.

Figure 16: Inventory of Usable Marijuana as of January 1, by License Type and Year

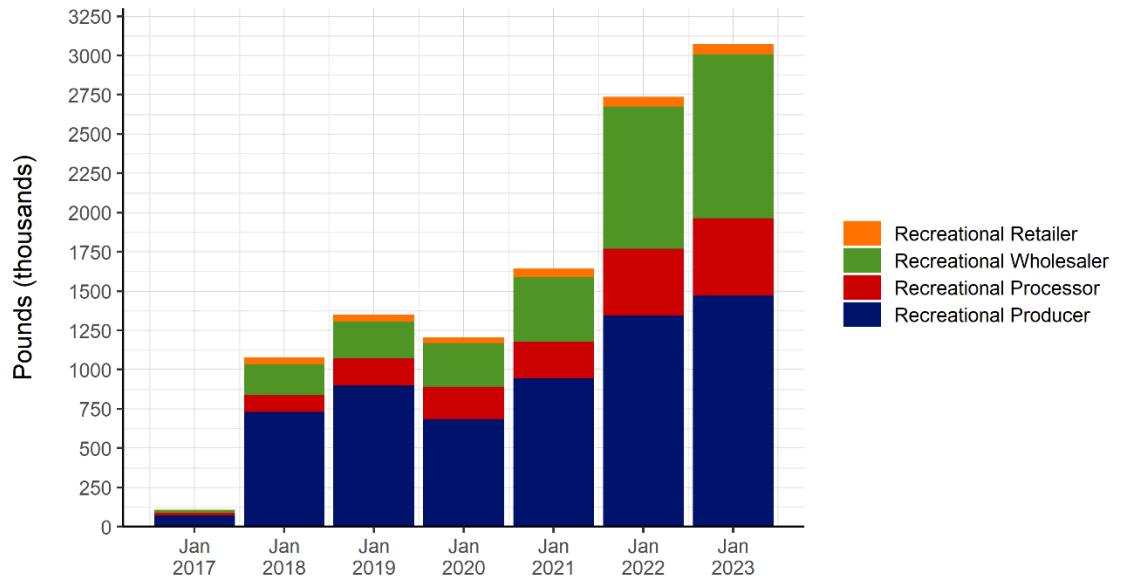
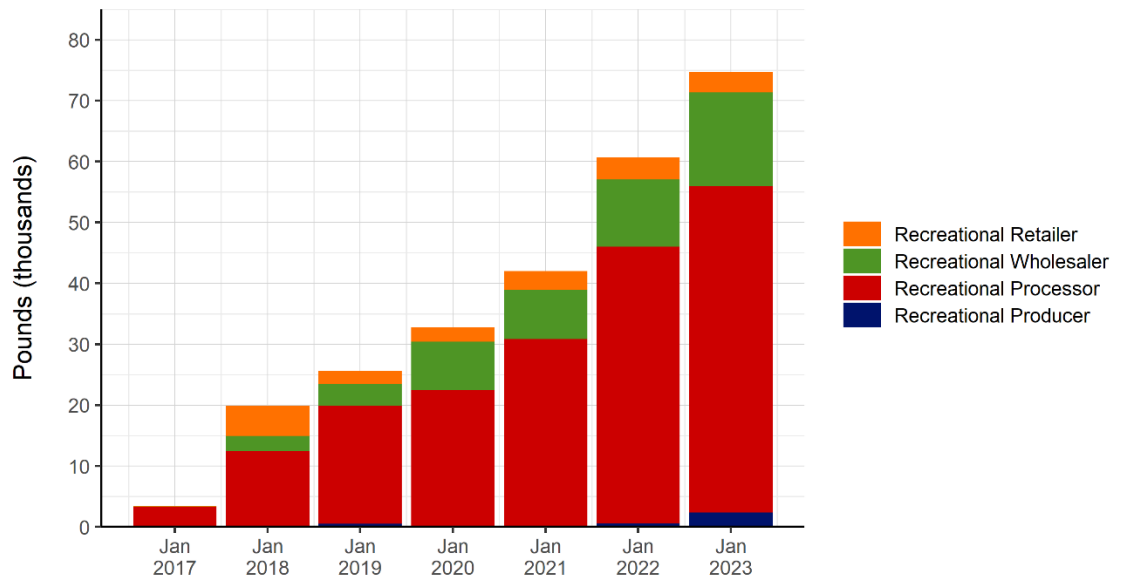
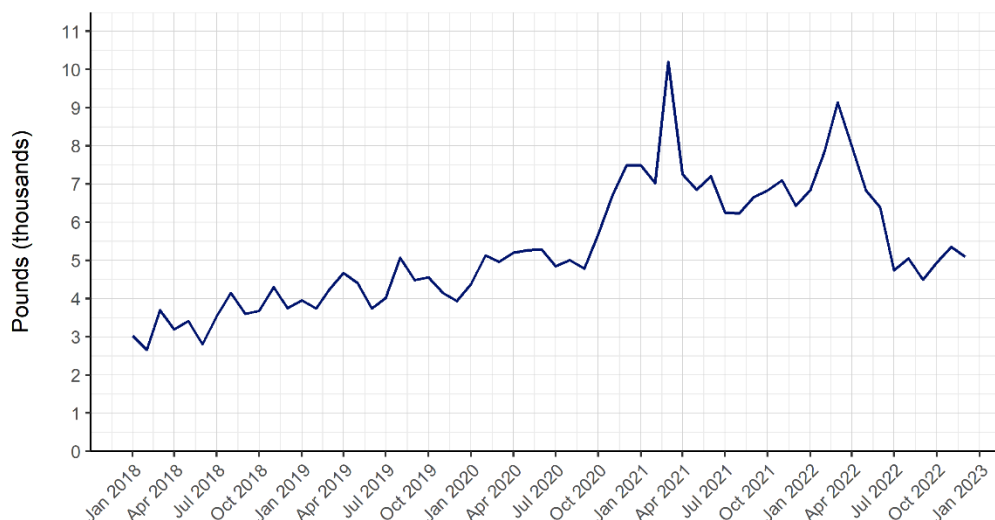


Figure 17: Inventory of Concentrates and Extracts as of January 1, by License Type and Year



Beyond point-in-time stockpiles of inventory, trends in Processor activity tell the same story: Processors are making fewer products, and therefore need less usable marijuana. Figure 18 illustrates this trend by month, with Processors ramping up their manufacturing of concentrates and extracts throughout 2021 and early 2022, before ramping back down to 2020-era levels.

Figure 18: Amount of Concentrates and Extracts Manufactured by Processors, by Month



In addition to making fewer products, Processors on average are also using older input material – indicating that for the products they are making, they are tapping older stockpiles of usable marijuana. Figure 19 shows the monthly trend of the age of input material, with the increase in the age of the peaks noticeably increasing. This trend is even more pronounced in Figure 20, which illustrates the year-over-year change (in days) of input age – while the 2019 and 2020 timeframes show flat or declining age of input material as Processors bought up Producers’ new material, the trend in 2021 and 2022 both show spikes similar to 2018, and indicate that Producers and Processors are working through back stock.

Figure 19: Median Age of Usable Marijuana Input Material in Concentrate and Extract Products, by Month

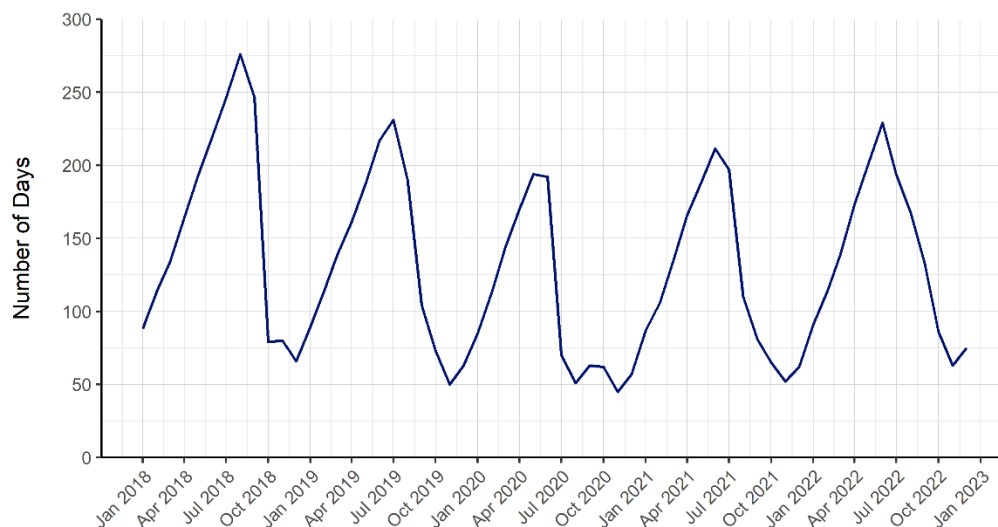
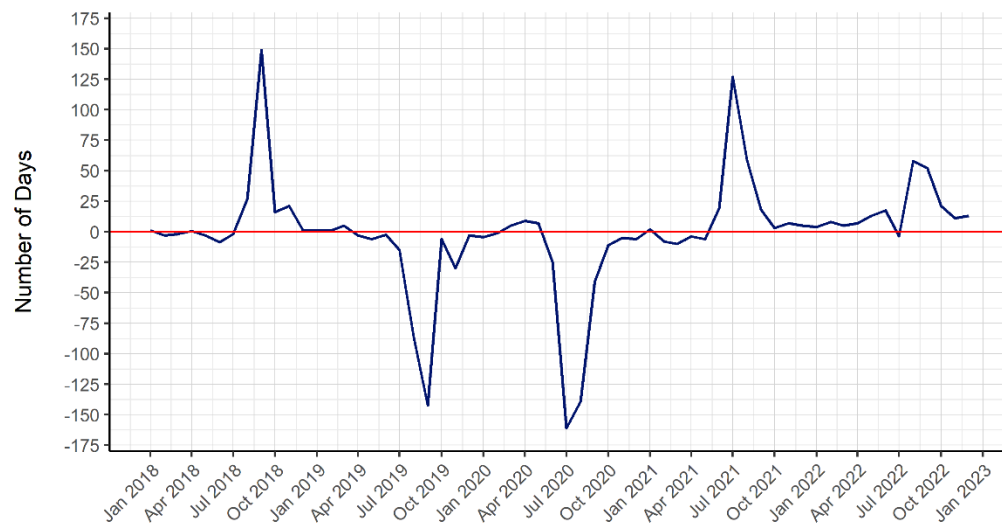


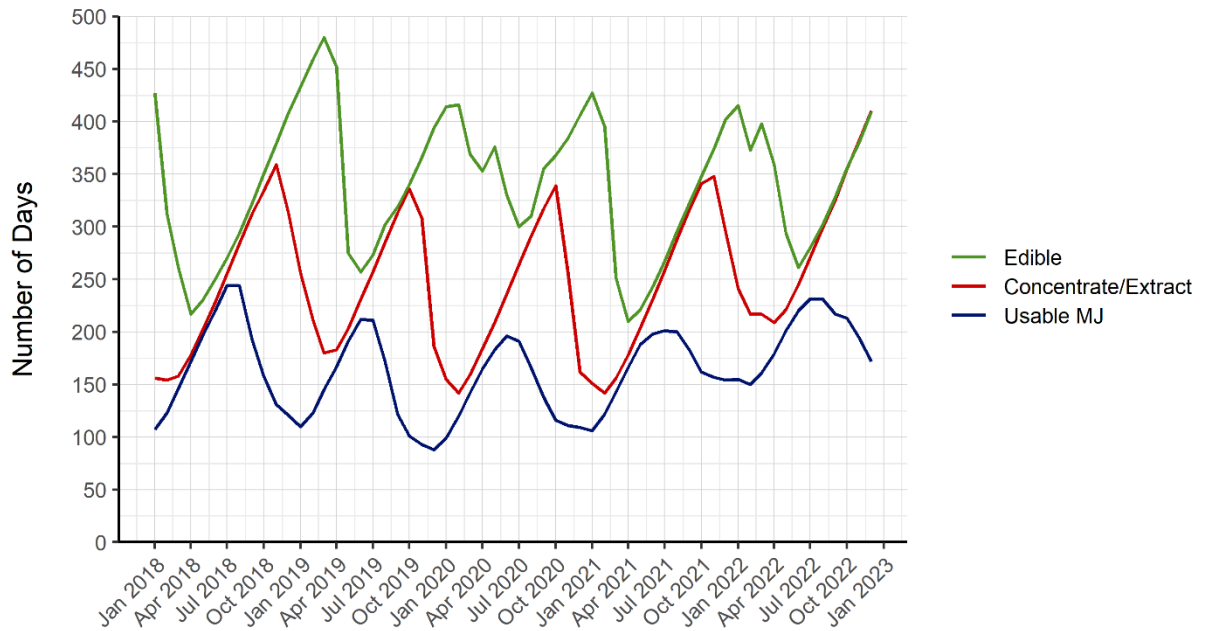
Figure 20: Year-Over-Year Change in Age of Usable Marijuana Input Material in Concentrate and Extract Products



Lastly, the average time since harvest of product sold at retail shows a similar – and for concentrates and extracts, even more severe – trend. Figure 21 measures the time since harvest of the source crop. Usable marijuana itself has the lowest age on average due to the harvested material going straight to market, as opposed to being used as input for further processing. Across the board, however, the average age of product sold has increased significantly. For example, the average age of usable marijuana sold in October 2022 was 31% higher (51 days) than it was in October 2021. Concentrates and extracts illustrate this trend even more starkly, with the time between the harvest of the input usable marijuana and the sale of the concentrate/extract increasing from 295 days in December 2021 to 410 days in December 2023 (an increase of 40%). Even more notable, **by November or December of each year, concentrates and extracts being sold tend to be more fresh than prior months, as the concentrates and extracts made from the fall outdoor crop come to market** – but this year, that trend line of age has continued to increase, indicating that the supply chain is still working through back stock made from the October 2021 harvest.

This then amounts to a double blow for Producers – larger stockpiles of usable marijuana in the supply chain due to less demand from Processors for input material, combined with decreasing demand from consumers of usable marijuana as a final product. As basic economic theory holds, the higher supply and lower demand in this product category will continue to put downward pressure on prices (wholesale and retail) for usable marijuana, so long as the dynamic continues.

Figure 21: Median Time since Harvest of Source Usable Marijuana, by Product Type and Month



Conclusion

The significant decline in the 2022 harvest represents a self-correction of the market that improves its position heading into 2023. However, this self-correction is not painless – it represents scores of cannabis businesses scaling back their ambition, often laying off employees or going out of business entirely. Moreover, while the annual *flow* of supply declined markedly, overall *stock* of supply that has accumulated over prior years is at all-time highs and will continue to put downward pressure on prices. This is especially true for usable marijuana, as there is evidence of less demand of usable marijuana from both consumers and Processors.

The Oregon recreational marijuana market has repeatedly shown that it is like any other market in one important respect, but unique in another. Like other markets, it is responsive to market signals and ramps supply up or down depending on demand. Unlike other markets, however, the federal status of cannabis means that Oregon is what has been termed a “market in a box” – supply must stay within the state’s borders, despite its strong comparative advantage in cannabis production. Demand can only increase so much, but supply is boundless, and that has placed Oregon in the disadvantageous position of continuing to produce far more cannabis than can be consumed by Oregonians. Until the federal government creates pathways to interstate commerce, the Oregon recreational marijuana market will be characterized by variations on the same theme: a competitive marketplace that features low prices for consumers but low margins for businesses. The narrowness of those margins, and the ability for Oregon cannabis businesses to operate under them, remains to be seen as we enter 2023.