

U.S. Region Products	Units	Assessed Price	Low	High
CBD Biomass (Aggregate)*	\$ / % CBD / pound	\$0.70	\$0.15	\$1.33
CBD Biomass (0 - 25K pounds)*	\$ / % CBD / pound	\$0.83	\$0.24	\$1.33
CBD Biomass (25K - 100K pounds)*	\$ / % CBD / pound	\$0.64	\$0.20	\$1.00
CBD Biomass (100K - 1M pounds)*	\$ / % CBD / pound	\$0.49	\$0.18	\$0.75
CBD Biomass (1M+ pounds)*	\$ / % CBD / pound	\$0.31	\$0.15	\$0.45
CBD Flower (Bulk)	\$ / pound	\$144	\$50	\$400
CBD Clones	\$ / each	\$2.16	\$1.50	\$3.80
Industrial Seeds	\$ / pound	\$3.28	\$2.00	\$4.00
CBD Seeds (Non-Feminized)	\$ / pound	\$328	\$75	\$1,100
CBD Seeds (Feminized)	\$ / seed	\$0.48	\$0.15	\$1.00
Crude Hemp Oil	\$ / kilogram	\$339	\$100	\$900
Refined Hemp Oil (Aggregate)	\$ / kilogram	\$1,549	\$500	\$4,000
Distillate - THC Free	\$ / kilogram	\$2,061	\$1,000	\$4,000
Distillate - Broad Spectrum	\$ / kilogram	\$1,395	\$875	\$2,500
Distillate - Full Spectrum	\$ / kilogram	\$954	\$500	\$1,245
CBD Isolate	\$ / kilogram	\$891	\$580	\$2,000
CBG Biomass (Aggregate)*	\$ / % CBG / pound	\$5.22	\$4.00	\$6.00
CBG Seeds	\$ / seed	\$0.94	\$0.50	\$1.40
CBG Clones	\$ / each	\$3.99	\$2.10	\$6.75
CBG Distillate	\$ / kilogram	\$4,825	\$2,500	\$7,500
CBG Isolate	\$ / kilogram	\$3,603	\$1,400	\$6,000

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Hemp Benchmarks® is an independent Price Reporting Agency (PRA). Our goal is to bring price transparency to wholesale hemp markets in order to allow businesses to operate with confidence and efficiency.

We do not have physical or financial exposure to the commodities that we assess, and therefore do not profit from liquidity, volumes or price movement, avoiding the potential for any perception of conflicts of interest that could arise for marketplaces and exchanges.

**Commodity market participants benefit from increased price transparency.**

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# H E M P BENCHMARKS®

## U.S Wholesale Hemp Price Benchmarks

May 2020

U.S. Region Products	Units	Apr-20	May-20	MoM \$Chg	MoM %Chg
CBD Biomass (Aggregate)*	\$ / % CBD / pound	\$0.81	\$0.70	(\$0.11)	-14%
CBD Biomass (0 - 25K pounds)*	\$ / % CBD / pound	\$0.91	\$0.83	(\$0.08)	-9%
CBD Biomass (25K - 100K pounds)*	\$ / % CBD / pound	\$0.80	\$0.64	(\$0.16)	-20%
CBD Biomass (100K - 1M pounds)*	\$ / % CBD / pound	\$0.59	\$0.49	(\$0.10)	-17%
CBD Biomass (1M+ pounds)*	\$ / % CBD / pound	\$0.43	\$0.31	(\$0.12)	-28%
CBD Flower (Bulk)	\$ / pound	\$145	\$144	(\$1)	-1%
CBD Clones	\$ / each	\$2.80	\$2.16	(\$0.64)	-23%
Industrial Seeds	\$ / pound	\$3.41	\$3.28	(\$0.13)	-4%
CBD Seeds (Non-Feminized)	\$ / pound	\$578	\$328	(\$250)	-43%
CBD Seeds (Feminized)	\$ / seed	\$0.59	\$0.48	(\$0.11)	-19%
Crude Hemp Oil	\$ / kilogram	\$376	\$339	(\$37)	-10%
Refined Hemp Oil (Aggregate)	\$ / kilogram	\$1,744	\$1,549	(\$195)	-11%
Distillate - THC Free	\$ / kilogram	\$2,497	\$2,061	(\$436)	-17%
Distillate - Broad Spectrum	\$ / kilogram	\$1,553	\$1,395	(\$158)	-10%
Distillate - Full Spectrum	\$ / kilogram	\$1,048	\$954	(\$94)	-9%
CBD Isolate	\$ / kilogram	\$1,018	\$891	(\$127)	-12%
CBG Biomass (Aggregate)*	\$ / % CBG / pound	\$6.07	\$5.22	(\$0.85)	-14%
CBG Seeds	\$ / seed	\$1.06	\$0.94	(\$0.12)	-11%
CBG Clones	\$ / each	\$5.10	\$3.99	(\$1.11)	-22%
CBG Distillate	\$ / kilogram	\$5,231	\$4,825	(\$406)	-8%
CBG Isolate	\$ / kilogram	\$4,475	\$3,603	(\$872)	-19%

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\*Hemp Benchmarks has modified our CBD and CBG Biomass assessment methodology. Due to a limited number of reported transactions for such biomass, and the relatively smaller volumes being traded currently, we are now employing historical correlations according to deal size in order to calculate price assessments for the aforementioned product categories.

### Price Commentary

Prices for the various hemp and hemp-derived products covered by our reporting continued to slide in May. Reports from our Price Contributor Network, market participants interviewed for this report, and other sources have consistently emphasized that sales of CBD Biomass and extracted CBD products were already slow in the wake of 2019's harvest, and have worsened since the COVID-19 pandemic gripped the U.S. in March.

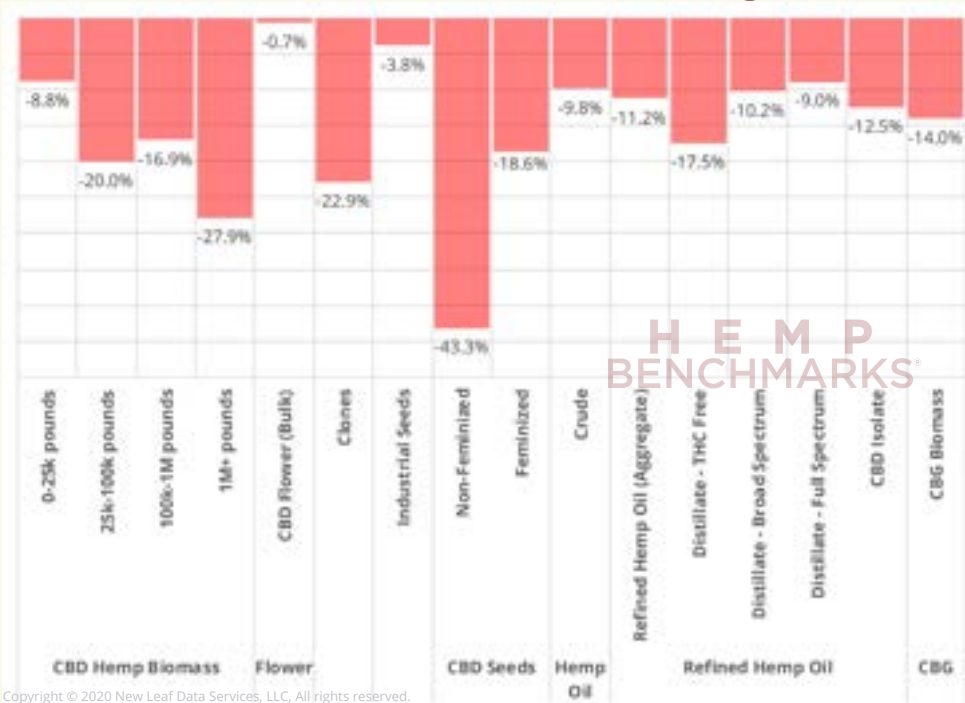
Retail sales of CBD products were also already softening as the pandemic arrived, as we discuss below in an examination of Q1 financials reported by publicly-traded CBD companies. Plateauing demand has led to processors building large inventories of extracted CBD products. There are signs that direct-to-consumer sales are a potentially promising channel to move inventory at the moment, but the current state of affairs means that extractors are still largely refraining from purchasing hemp biomass outright, and instead are offering farmers tolling arrangements. As a result, we have observed the frequency and volumes of CBD Biomass sales contract significantly in recent months, even as large amounts of 2019's harvest remain unsold and 2020's crop gets underway.

As the hemp-CBD wholesale market has cooled, prices for smokable CBD Flower have recently stabilized more than many other products. The per-pound rate for May was essentially flat from April, though current prices are down by a bit over 10% compared to those assessed in February and March.

Reports out of at least one state - Indiana - have noted that more farmers are looking to farm hemp for smokable CBD Flower this year, even though Indiana law currently prohibits such production.

Low prices for CBD are also prompting market participants to increasingly pivot to other end markets, such as CBG or industrial applications, like fiber and seed. Rates for CBG Biomass and extracted products remain much higher than those of their CBD counterparts, but have been sinking consistently since we began assessing prices for them earlier this year.

### Month-on-Month % Price Change



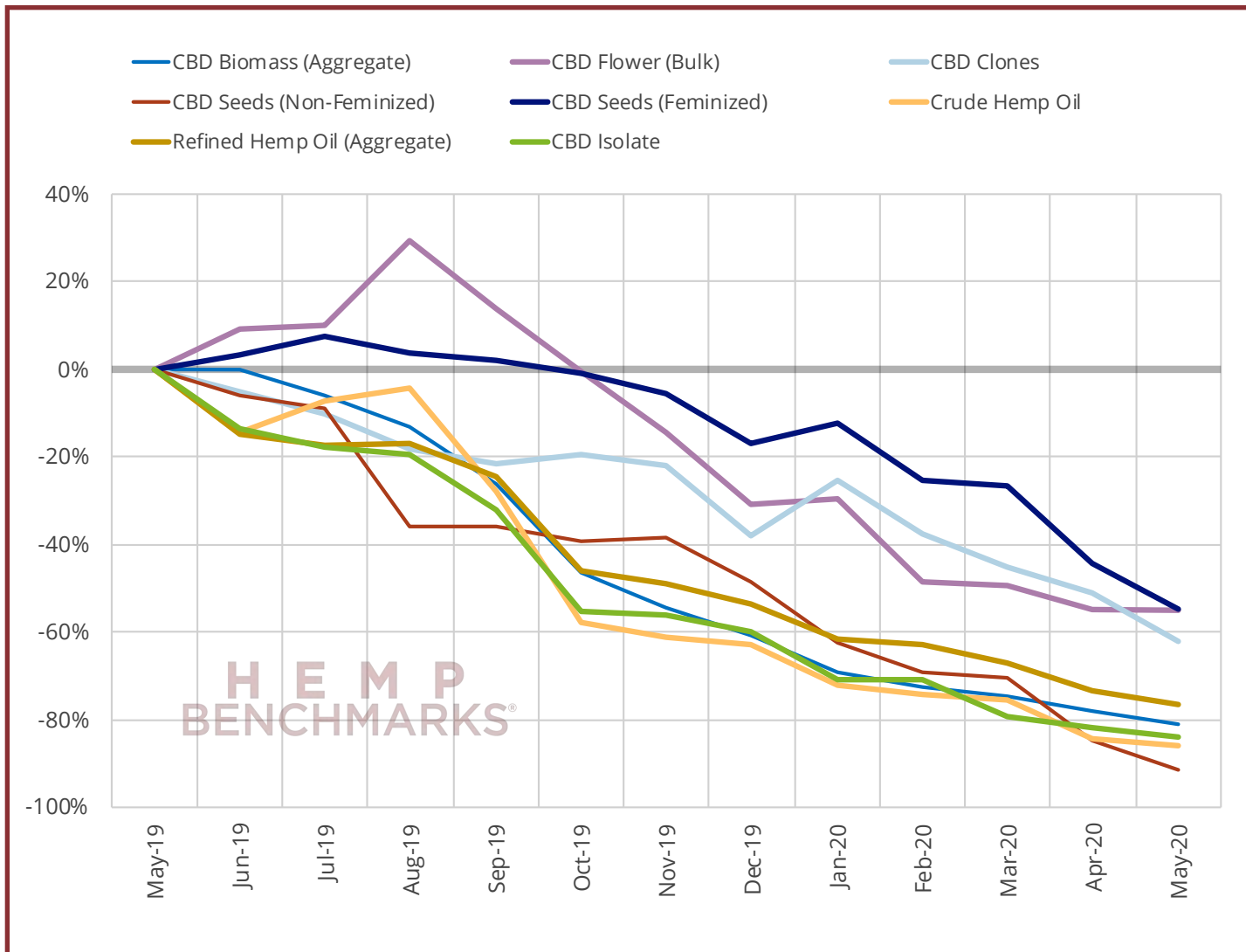
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### Become a Member of our Price Contributor Network

Members of our Price Contributor Network are our partners, and together we bring transparency and efficiencies to the U.S. and international hemp markets. Our partners provide Hemp Benchmarks with wholesale market data and receive discounted subscriptions, complimentary special reports, and exclusive wholesale market analysis in return. If you are a cultivator, extractor, processor or manufacturer, contact us and let's start working together.

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### Year on Year Price % Change: May 2019 to May 2020



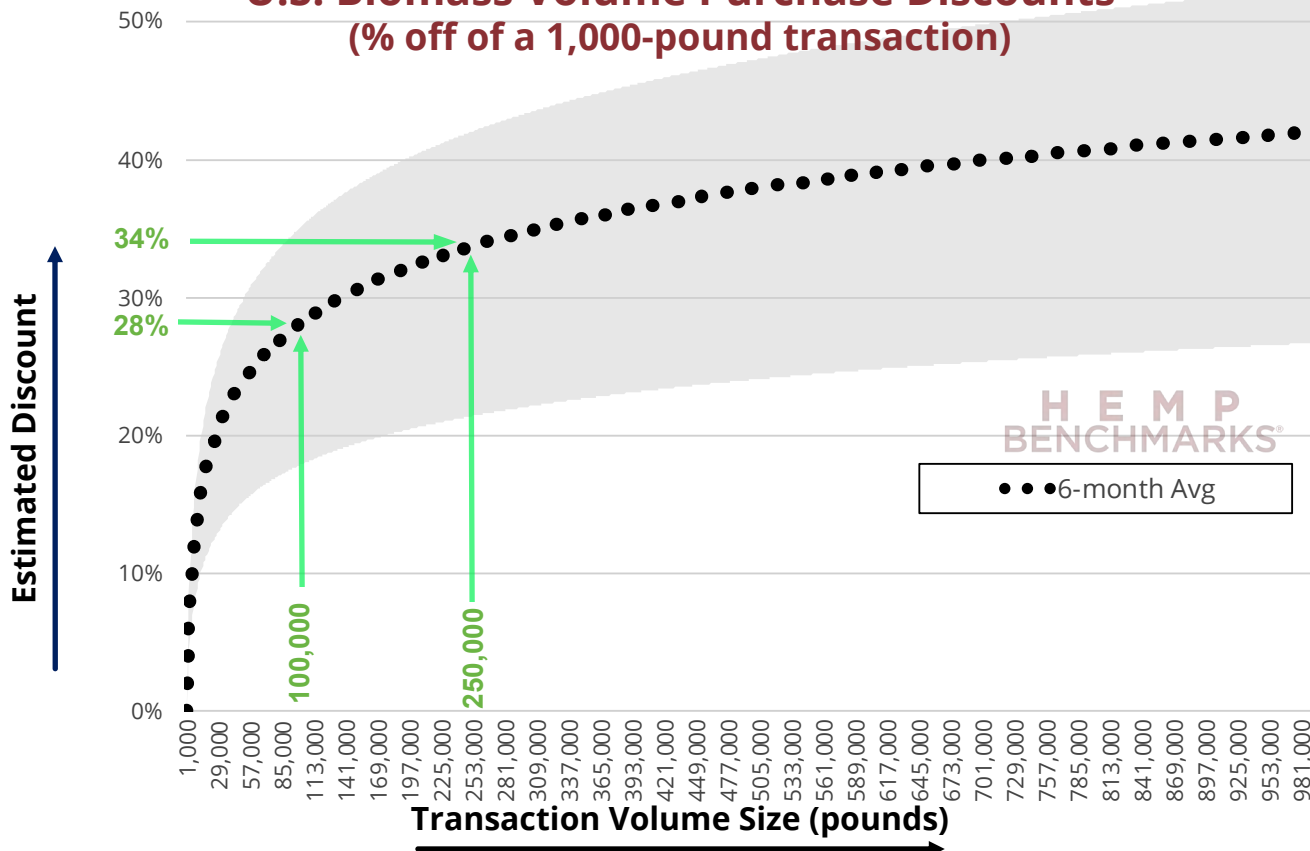
This chart illustrates the dramatic erosion in wholesale prices in the U.S. hemp market over the past year. It also reinforces the data illustrated in the Correlation Matrix, on page 6, which has consistently shown that price movement in the hemp-CBD supply chain is strongly correlated. The major exception is the price for smokable CBD Flower, which rose through last summer as demand manifested amongst consumers. However, with plentiful supply in the wake of the harvest, rates for high-CBD Flower have plunged after peaking in August 2019.

### Biomass Volume Discount Pricing

Volume discount pricing is a strategy that provides a financial incentive for purchasing a product or service in large amounts. In simple terms, customers purchasing more generally receive a lower price per unit.

Based on the data we have collected over the past six months, we have calculated the volume discounts that biomass purchasers received each month when doing deals larger than 1,000 pounds. Each month has shown a drastically different discount curve (as represented in the grey area) dictated by the absolute price level, season, and transactions collected. The black dotted line below shows the average of the past six monthly discount curves and represents a good proxy that buyers and sellers can use to settle trades of various sizes.

### U.S. Biomass Volume Purchase Discounts (% off of a 1,000-pound transaction)



Ask us how our pricing  
can help  
negotiate your next  
transaction

### Wholesale Prices - Correlation Matrix

April 2019 to May 2019 Data

	CBD Biomass	CBD Flower (Bulk)	Clones	Industrial Seeds	CBD Seeds (Non-Feminized)	CBD Seeds (Feminized)	Crude Hemp Oil	Refined Hemp Oil (Aggregate)	CBD Isolate
CBD Biomass		0.88	0.91	0.15	0.90	0.84	0.88	0.98	0.99
CBD Flower (Bulk)	0.88		0.83	0.50	0.72	0.91	0.70	0.85	0.84
Clones	0.91	0.83		0.05	0.92	0.93	0.83	0.93	0.92
Industrial Seeds	0.15	0.50	0.05		-0.09	0.35	-0.03	0.11	0.08
CBD Seeds (Non-Feminized)	0.89	0.72	0.92	-0.09		0.81	0.95	0.94	0.93
CBD Seeds (Feminized)	0.86	0.91	0.93	0.35	0.81		0.71	0.85	0.83
Crude Hemp Oil	0.87	0.70	0.83	-0.03	0.95	0.71		0.93	0.93
Refined Hemp Oil (Aggregate)	0.98	0.85	0.93	0.11	0.94	0.85	0.93		1.00
CBD Isolate	0.99	0.84	0.92	0.08	0.93	0.83	0.93	1.00	

### What does this mean?

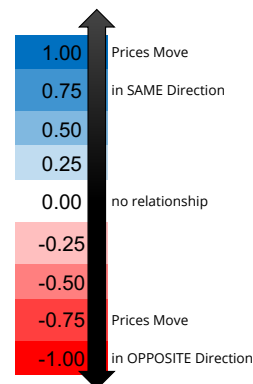
This wholesale price correlation matrix was generated from historical Hemp Benchmarks price assessments. It shows which product prices move together, move in opposite directions, or have no relationship at all. Correlations range from 1 to -1. If two products have a perfect positive correlation coefficient of 1, then the prices for each have been observed to move in the same direction, either up or down, by the same magnitude. A perfect negative correlation of -1 means that prices for two products move in opposite directions. A correlation of 0 indicates no relationship at all.

### Interpretation

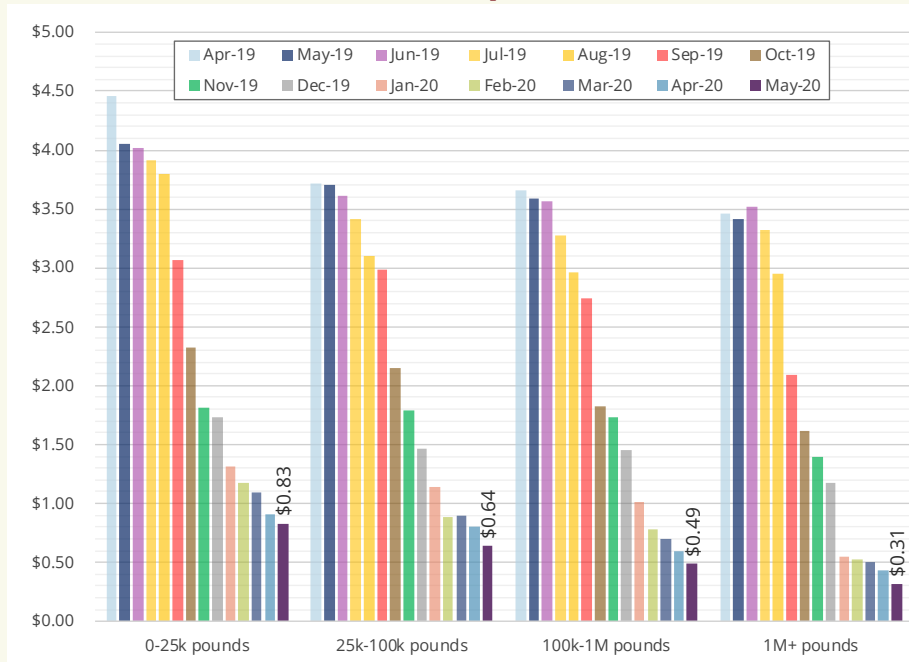
In each month so far this year, the aggregate price for Refined Hemp Oil (which includes all three types of CBD Distillates) has had a perfect positive correlation with the price for CBD Isolate. This is notable as CBD Isolate was previously a favored end product of the hemp-CBD market, but has ceded that position to THC Free Distillate more recently. Still, the correlation matrix shows that the aggregate price for all Distillates is decreasing in line with that for CBD Isolate, emphasizing the tough market conditions currently facing sellers, no matter the product.

### Example:

The correlation between Refined Hemp Oil and CBD Biomass is 0.98. This means that, based on currently available data, the prices of these two products have almost always moved in the same direction by nearly the same magnitude month-to-month.

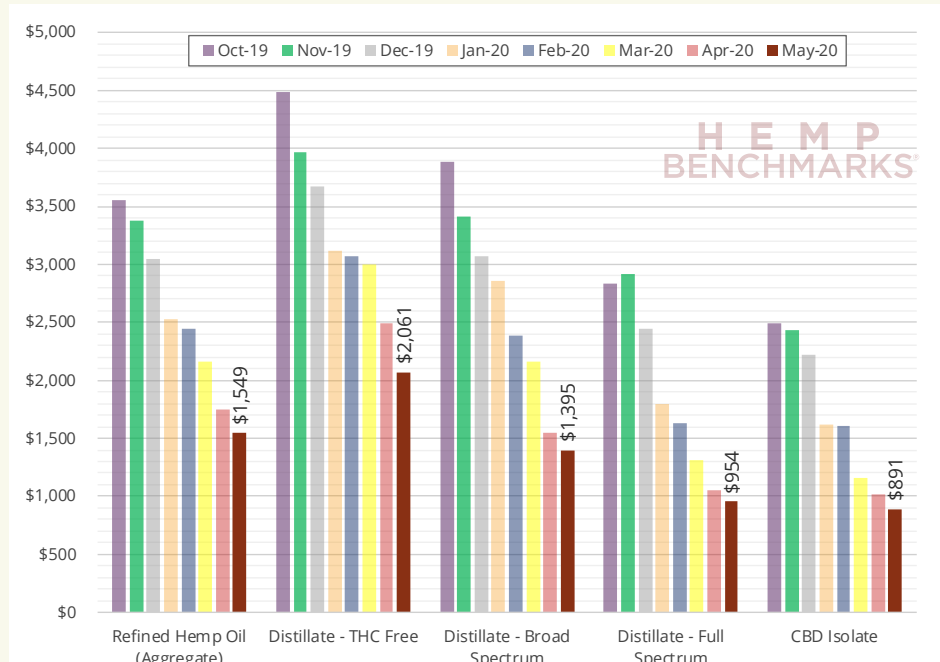


### U.S. Biomass Wholesale Pricing Trends (\$ / %CBD / pound)



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### Refined Hemp Oil Pricing Trends (\$ / kilo)



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### May 2020: Planting Season Arrives Under the Shadows of 2019 and COVID-19

As the hemp sector considers the lessons learned in 2019, it also has to contend with the impact of this year's historic COVID-19 pandemic, all with the 2020 growing season beginning in earnest in May. Reports from the field indicate that production could contract this year after 2019's record crop generated a glut of CBD biomass, significant portions of which remain unsold. Those that do choose to farm will likely see better planting season conditions than in 2019, based on current forecasts.

Meanwhile, the unprecedented COVID-19, or novel coronavirus, pandemic, has negatively impacted already slow sales of CBD hemp plant material and extracted products, resulting in some market participants pivoting to focus on online sales, CBG, other end markets, or to exit entirely. Recent financial filings also suggest that demand for CBD may have crested for the moment, as regulatory uncertainty prevents broader marketing of the cannabinoid. A recent survey on extraction methods and capacity conducted by Hemp Benchmarks sheds more light on that portion of the hemp-CBD supply chain.

Hemp's still-complicated status with the federal government was emphasized this month by the crop's initial exclusion from a coronavirus relief program overseen by the U.S. Department of Agriculture (USDA). However, states continued to forge ahead in May: Colorado circulated guidelines for the sale of hemp-derived products in the state's licensed cannabis retailers, Montana farmers voted to establish a checkoff program to support and grow the state's industry, and the initial opportunity to apply for hemp cultivation licenses in Florida drew hundreds of submissions almost immediately, among other developments.

### Oversupply and Uncertainty Prompts Producers to Pull Back, Pivot

Even prior to the economic disruption caused by the COVID-19 pandemic this year, American hemp growers were dealing with slow to nonexistent sales as a glut of CBD biomass produced in 2019 overwhelmed the market. Now, with planting season arriving, state licensing data indicates that some farmers are pulling back this year, either by growing smaller plots or not at all.

The pullback in hemp acreage was emphasized by Gary McAninch, the Nursery, Christmas Tree, and Hemp Program Manager for the Oregon Department of Agriculture. "Last year we had approximately 63,000 acres registered the entire year for growing hemp," he said in an interview with Hemp Benchmarks. "This year so far we have just under 30,000; 29,500 acres approximately. We accept registration applications year round, so we're likely to bump that up some, but it's hard to say how much."

McAninch said he cannot tell exactly how the virus is affecting the 2020 season, but he noted that growers are still having issues selling last year's crop. "Some in the industry are sitting on [biomass], waiting for the right buyer at the right price," he added. "There were some that were burnt last year. As you know it's a heavy investment and maybe the expectations didn't meet what the reality was, in the end. Maybe some people are shying away. But we still have plenty of people registering."

Other states with large industrial hemp programs have also seen significant reductions in permitted acreage and licensed producers. In 2019, Montana officials licensed 197 farmers, who registered 45,000 acres for hemp cultivation, with 80% of that acreage planned for CBD production. 130 licensees ended up harvesting about 25,000 acres.



As of May 26, 2020, Montana regulators have approved 82 licensees covering 11,000 acres and 86,000 square feet of indoor or greenhouse space, according to Andy Gray, Hemp Program Manager for the state's Department of Agriculture. Of the 11,000 acres, about 85% is for fiber and grain, with the remainder for CBD. The data out of Montana represents the most significant shift away from CBD production observed to date in the U.S. Montana farmers may be shying away from CBD hemp varieties in part due to experiences last season, when 25% of the CBD cultivars planted in the state tested "hot," with excessive THC levels. Gray noted that some license applications are still being reviewed, while the deadline to apply for a permit to farm hemp in Montana is June 1.

Another big year-over-year drop in licensed acreage was reported in North Carolina. Paul Adams, Industrial Hemp Program Manager for the North Carolina Department of Agriculture & Consumer Services, stated to Hemp Benchmarks that licensed acreage in the state is currently down by roughly 50% compared to 2019. As of May 13, 16,877 acres were licensed for hemp farming in North Carolina, down from 33,908 acres last year.

A slowdown in registrations to grow is also being reported in some younger hemp programs. According to Brian McGrew, Industrial Hemp Program Manager at the Arizona Department of Agriculture, the process of registering hemp growers has necessarily slowed down due to department staff being ordered to stay and work at home due to COVID-19. While his state has issued about the same amount of hemp licenses this season as they did last year, "a lot of our growers are doing smaller plots, more test plot trials," he told Hemp Benchmarks. The majority of this season's hemp growers in Arizona, he observed, also appear to be more experienced farmers.

Lester Cannon, head of the hemp program at the Louisiana Department of Agriculture and Forestry, noted that 2020 is his state's first year of commercial hemp production. He told Hemp

Benchmarks that many of the new hemp growers are "non-traditional farmers," coming from nurseries, as well as small truck and vegetable farms.

"And a lot of folks that have never grown anything in their life," he added. "That's probably the lion's share of our applicants." At the same time, there is a lot of wait-and-see regarding Louisiana's hemp industry from its mainstream agricultural community. "A lot of those folks are sitting on the sidelines," Cannon said. "They want to see where this thing is going before they take on that additional risk."

Cannon reported that his state has around 2,000 acres licensed this season for both hemp fiber and CBD production, and that there has been expanding investment in extraction and processing. "We're working with about a dozen or so processors for extraction, both for CBD and fiber as well," he said, "But a lot of those efforts have been stalled by the virus." Given that Louisiana only legalized hemp at the end of 2019, Cannon said those processing facilities might not be ready in time for this season.

Later on in this report, we examine data from a survey of hundreds of businesses who are extracting CBD and other cannabinoids from hemp, including biomass input and production capacity. As noted, there are some indications that biomass production could contract this year, compared to 2019's crop. A decrease in production could lead to higher wholesale prices for biomass, or to more farmers being able to find buyers, at least. However, definitive assessments of supply and demand for CBD biomass and extracted CBD products remain hazy, while accountings of operational hemp-cannabinoid processing capacity are virtually nonexistent. Additional information from several other states on hemp licensing and acreage registration can also be found below, in the State Updates section.

Meanwhile, those considering growing or processing hemp are contending not only with the vagaries of a new market, but how the coronavirus' unprecedented impact on the overall economy might affect hemp. Some observers believe that increased uncertainty generated by COVID-19 may slow the hemp "green rush" further. "With everything that's going on with this virus, I don't know if everyone is going to follow through and grow hemp, just because of the cost associated with it and the way the economy is right now," Katelyn Kesheimer, Auburn University Assistant Professor and Extension Specialist, said earlier this spring during an interview with [VSC News](#).

"My prediction is a lot of people who maybe were going to grow it, might just eat the license fee and not grow it," she added. "There's so much uncertainty in the economy right now. Folks that aren't making money and don't have jobs aren't going to spend money on CBD oil products. They're going to spend it on actual necessities."

While some may decide not to take a risk on hemp this year, other producers are pivoting in response to the current challenges. Ryan Rush, owner of Rush Hemp Farms in Maryville, Tennessee, produces small-batch CBD products. The company sells its tinctures, salves, and flower to consumers in 32 states, while working with hemp farms in North Carolina, Kentucky, and Tennessee.

He told Hemp Benchmarks the COVID pandemic has caused his business to shift gears. "Wholesale sales have dropped, probably by 80%," he said. "But as far as retail, internet sales have exploded and just gone crazy." Online sales, he continued, have jumped 200% compared to last year with buyers as far afield as Colorado and California. Still, Rush said he is also sitting on 30,000 pounds of biomass, that has "backed up" from the farms with which his company works.

A recent [press release](#) from Marijuana Company of America, describes a different type of pivot in its joint venture hemp project, Covered Bridge Acres (CBA), located in Scio, Oregon. According to the company, "In light of the current market conditions for [CBD biomass and flower] due to overproduction in 2019, and slower than expected sales due to the pandemic, CBA has decided to change its focus for 2020. This year, CBA will focus on producing a high quality CBG (Cannabigerol) flower in its greenhouses."

### Weather Outlook

Those who are choosing to farm hemp this year will likely see better planting season conditions than in 2019, when heavy spring rains saturated and flooded fields in numerous regions of the country. According to the National Weather Service's Climate Prediction Center (CPC), some areas of the country will see a higher probability of above-normal precipitation in late May and early June, including the West Coast, Southwest, Southeast, Gulf Coast, and western Colorado. However, a "hazards outlook" identifies only a slight risk of heavy precipitation limited to much of Texas, as well as southern Oklahoma and the western edge of Louisiana.

Looking further ahead, the CPC's [three month outlook](#) for June, July, and August favors above-normal temperatures for much of the Western, Gulf Coast, and East Coast states, as well as Alaska. Near-normal temperatures are forecast for the upper to middle Mississippi Valley and parts of the Great Plains. The forecast also expects above-normal temperatures to expand across the entirety of the continental U.S during the late summer and early fall, particularly in the Southwest. In 2019, high temperatures in Arizona were blamed for a significant portion of the state's crop testing hot.

Above-normal precipitation during the three-month timeframe is expected for much of the eastern and central U.S., with below-normal precipitation forecast across the Pacific Northwest, much of

the Rockies, and the northern Great Basin, which constitutes most of Nevada, half of Utah, and sections of Oregon and California (as well as Wyoming and Idaho).

The Atlantic hurricane season, meanwhile, begins on June 1 and runs through November 30. The CPC is predicting a 60% chance of an above-normal hurricane season for 2020. A late May update details the likelihood of 13 to 19 named storms, of which six to 10 could become hurricanes (winds of 74 miles per hour or higher), including between three and six major ones.

### Hemp Benchmarks Extraction Survey

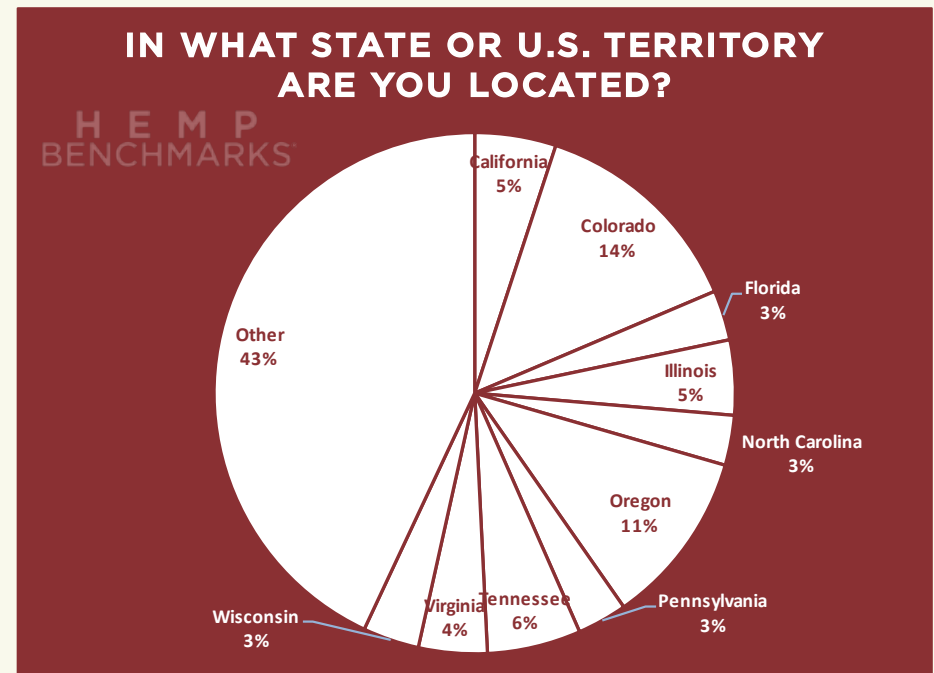
In order to more accurately gauge existing processing capacity, Hemp Benchmarks circulated a survey on CBD and other cannabinoid extraction from industrial hemp. We received over 400 responses, with over 250 of the respondents stating that they are currently operating a hemp cannabinoid extraction facility or are actively building one. The following data, charts, and commentary will focus on the information provided by those operators. Survey questions focused on methods, input capacity, and production capacity for Crude Oil, Full and Broad Spectrum Distillates, the removal and/or remediation of THC from distillates, and Isolate.

The respondents currently operating or actively building extraction facilities are located in 43 U.S. states, as well as Canada, Europe, South America, and Africa. Just under a quarter of the respondents stated that their operations were located in either Colorado or Oregon. Tennessee, California, Illinois, and Virginia are each home to between 4% and 5% of the operators who responded to the survey. The states with no positive responses are Alaska, Hawaii, Mississippi, New Hampshire, New Jersey, South Dakota, and Wyoming, as well as Washington, D.C.

Finally, of the over 150 respondents who stated that they are

not currently operating or actively building an extraction facility, roughly three-quarters identified themselves as hemp farmers, while over two-thirds stated that they do not plan to build an extraction facility in the future.

### Survey Responses



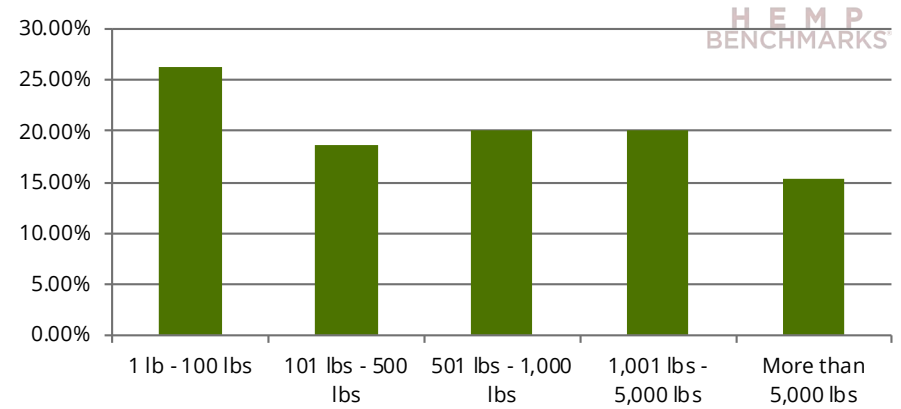
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*Results Cont'd on next page*

### Crude

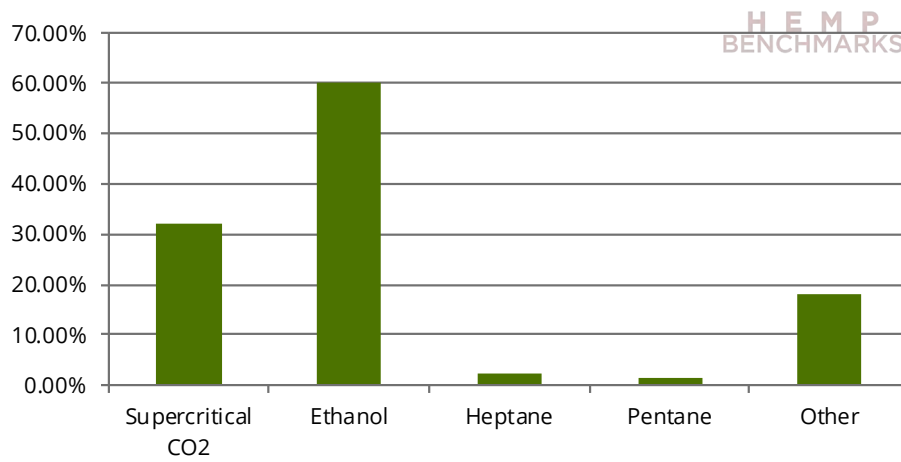
- Over 85% of operators stated that their facility produces crude CBD oil from hemp biomass.
- Daily input capacities were fairly evenly distributed across the different volume brackets specified, though almost 45% stated that they could process a maximum of 500 pounds of biomass daily.
- A slight majority of respondents are generating 1,000 kg of crude or less monthly.
- Almost 60% of respondents employ ethanol to produce crude oil from hemp biomass, while about 32% use supercritical CO<sub>2</sub>.

What is your daily input capacity for hemp biomass in pounds?



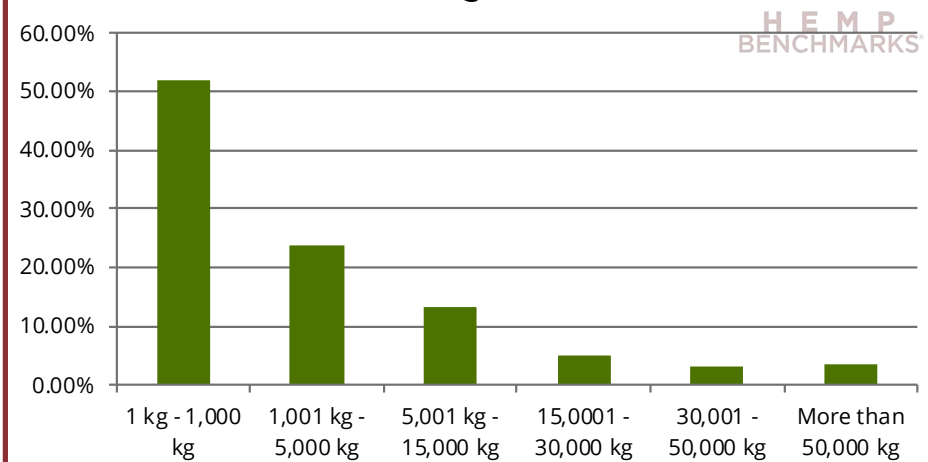
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What do you use for extracting hemp biomass into crude oil?



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What is your monthly production of crude oil in kilograms?



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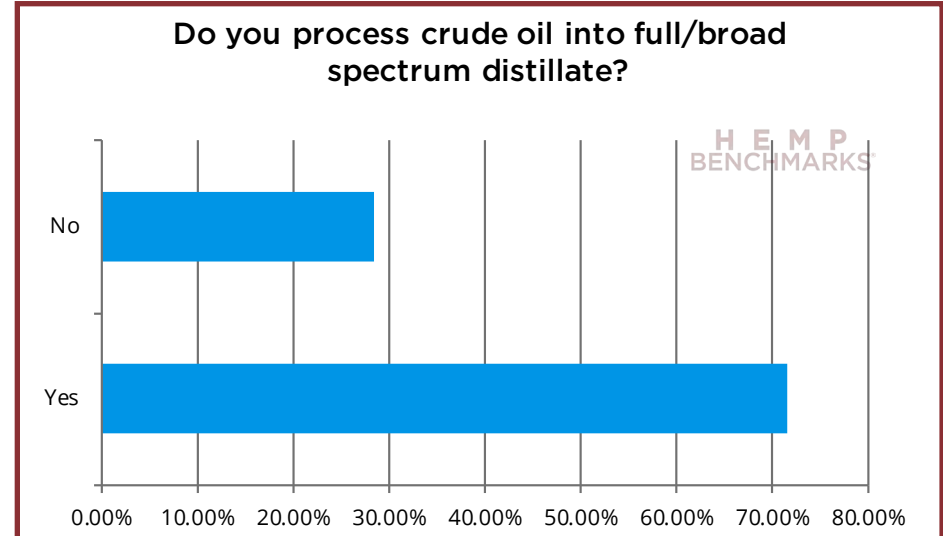
### Monthly U.S. Crude Hemp Oil Processing Capacity Operational & Planned - May 2020



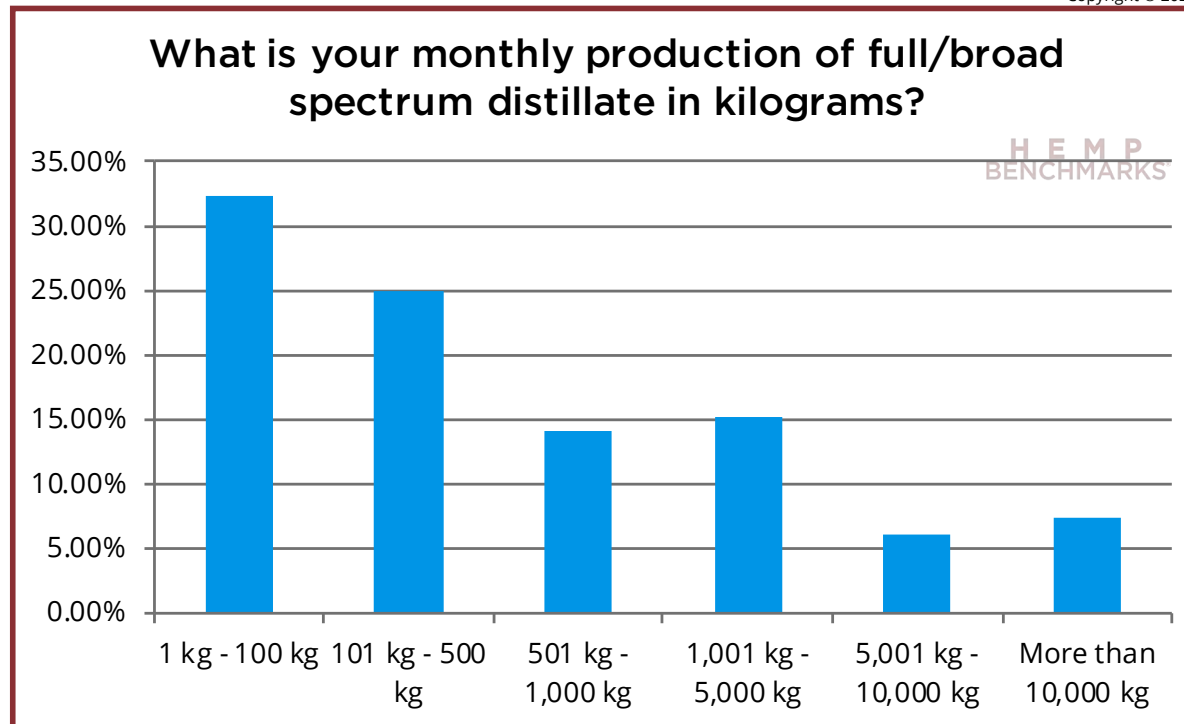
Source: Hemp Benchmarks, CBD Wholesale Network, Sweet Leaf Capital, and Almastone

### Full / Broad Spectrum Distillate

- Over 70% of actively operating respondents stated that their facility produces full and / or broad spectrum distillate.
- Production volume for distillates is smaller than for crude, with almost 60% reporting that they generate 500 kg or less monthly.



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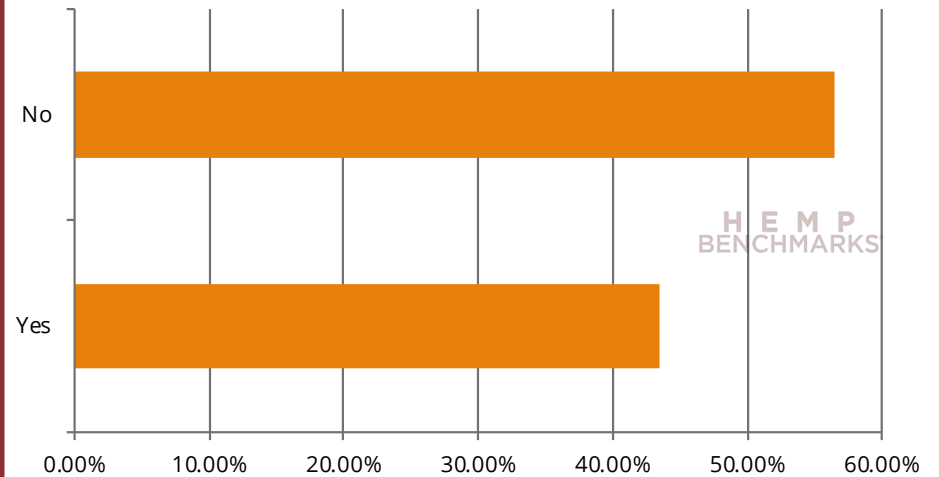
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### THC Remediation / Removal

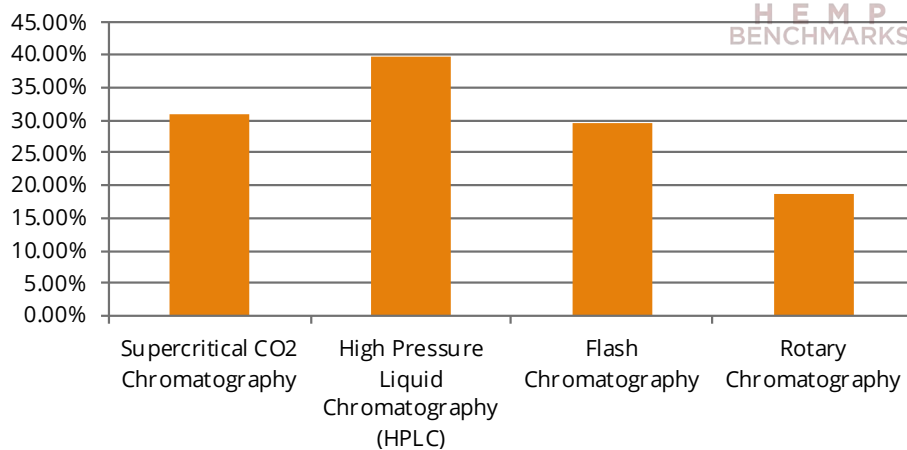
- While most respondents produce crude and distillates, under 45% stated that their facilities can perform THC remediation or removal from extracted hemp products.
- Each of the four processes to do so received a significant proportion of respondents, but almost 40% use HPLC. Some respondents employ multiple methods to remove or remediate THC, resulting in the total adding up to over 100%.
- As expected due to loss in each step of the refining process, production volumes for THC remediated distillate (THC free, in other words) are significantly smaller than for the earlier intermediate products. Over a third of those remediating or removing THC generate 50 kg or less monthly.

### Do you perform THC remediation or removal?



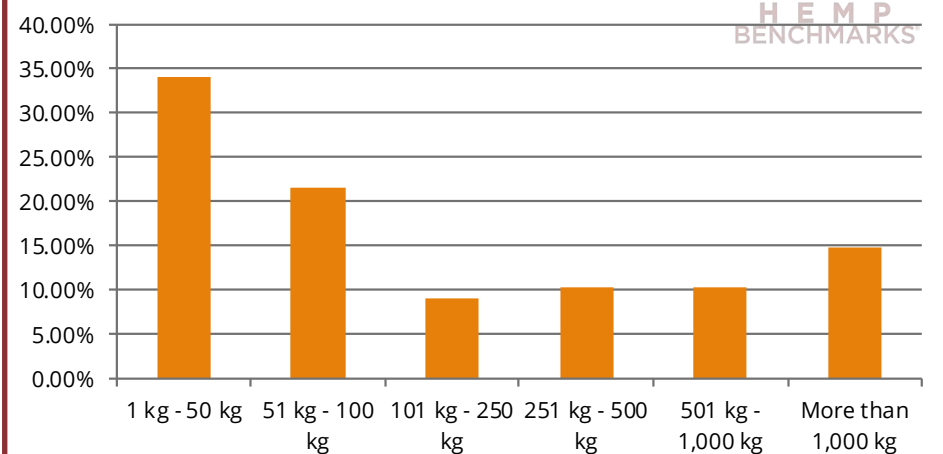
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### What technique do you use for THC remediation or removal?



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### What is your monthly production of THC remediated distillate in kilograms?



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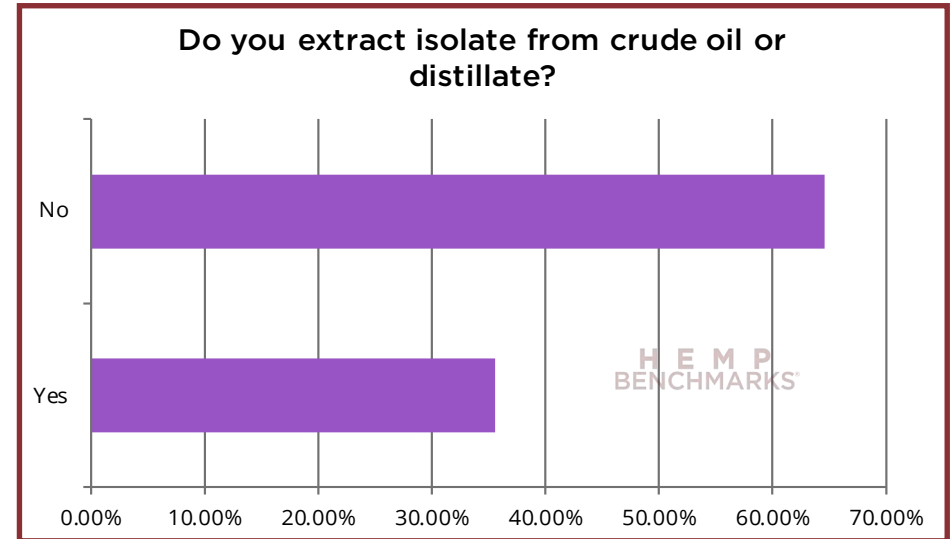
### Monthly U.S. THC Remediation Processing Capacity Operational & Planned - May 2020



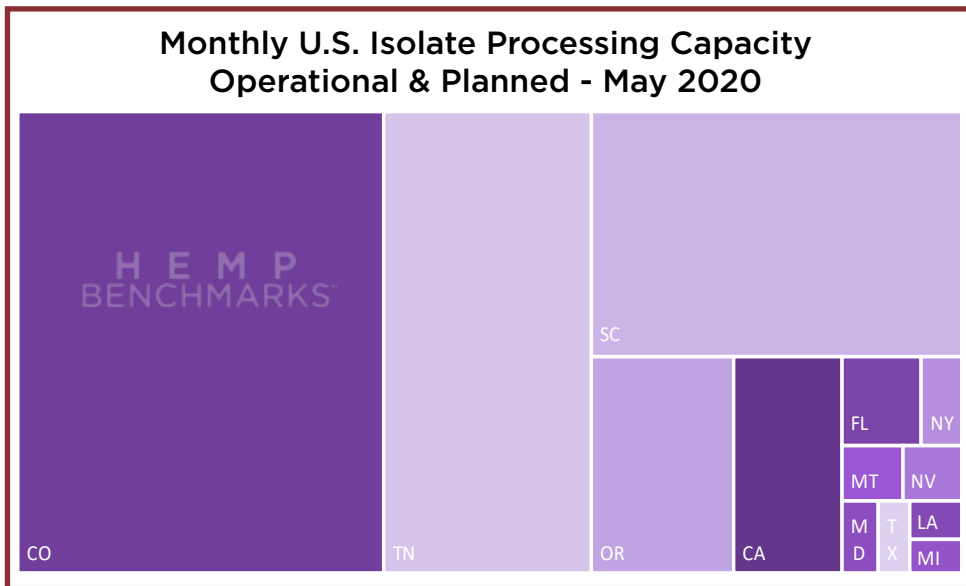
Source: Hemp Benchmarks May 2020 Extraction Survey

### Isolate

- Initially a favored end-product, demand for CBD isolate has dropped since last year. Almost 65% of respondents that are currently operational or actively building a facility stated that they do not or will not produce CBD isolate.

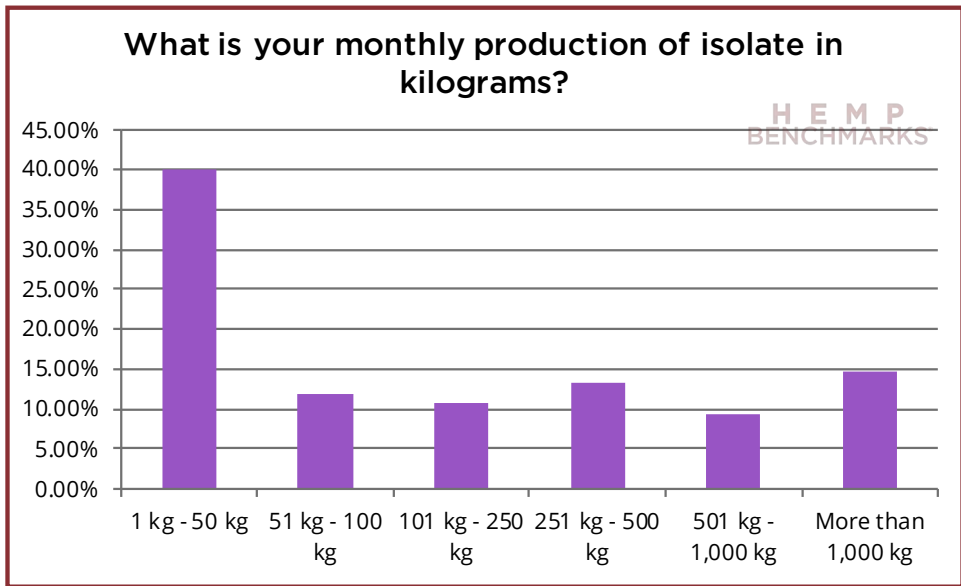


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Source: Hemp Benchmarks May 2020 Extraction Survey

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### CBD Sales Slow Overall, but DTC Ecommerce Expands Due to Pandemic

With most domestic hemp producers and processors focused on the production of cannabinoids, primarily CBD, the size and growth of the CBD market are key issues for all market participants, while the impact of COVID-19 raises a new concern. Prior to the emergence of the pandemic - and the stay-at-home orders and business closures implemented to mitigate its spread - there were indications that the CBD market might not meet lofty growth expectations for 2020. Several publicly-traded CBD companies reported declining revenues in Q1 2020, before the full impact of the coronavirus was felt across the country.

For example, Charlotte's Web reported that sales in Q1 2020 declined for the second quarter in a row, to \$21.5 million, which is a bit under \$21.7 million in revenue in Q1 2019. Similarly, cbdMD had its first sequential decrease in revenues in Q1 2020, to \$9.4 million, from \$10.1 million in Q4 2019. Charlotte's Web and cbdMD, however, both benefited from a large percentage of online sales.

CV Sciences and Elixinol, companies with smaller online presences, suffered larger revenue declines. CV Sciences reported earnings of \$8.3 million for Q1 2020, a 45% drop year-over-year and an 11% decline from Q4 2019. This despite a 42% increase in the number of retail stores carrying CV Sciences products. Elixinol's Q1 2020 revenues slipped by 25% from Q4 2019, to \$3.3 million.

All of the aforementioned companies, however, saw an increase in the percentage of revenues generated by online sales. For example, Charlotte's Web's direct-to-consumer ecommerce sales grew by 29% year-over-year, to account for almost 66% of total revenues in Q1 2020, up from 50% of sales in Q1 2019. CV Sciences saw online sales expand to 24% of revenues in Q1 2020, from 15% in the same period a year ago.

In the face of existing headwinds, how is COVID-19 impacting the CBD market? On one hand, CBD's purported - but largely unverified - abilities to mitigate stress, anxiety, and insomnia suggest the possibility of increased consumer demand under current conditions. On the other hand, the pandemic has had a significant impact on existing sales channels, as many brick-and-mortar stores that carry CBD products have been compelled to close under stay-at-home orders. As demonstrated above, COVID-related lockdowns have increased the importance of a strong online presence. Notably, Green Growth Brands filed for protection under the Companies' Creditor Arrangement Act (the Canadian equivalent of Chapter 11) and shuttered its chain of retail CBD stores, Seventh Sense, when malls in Canada were closed.

It is unclear if CBD product sales have increased in stores that were deemed to be essential and remained open during lockdowns. An April report from [New Hope Network](#) noted that brands and retailers are reporting record sales growth in the immunity supplement category, from vitamin C to elderberry. CBD sales, however, have been flat: "There is some lift in virtually every area in supplements," Kathryn Peters, executive vice president of business development for SPINS, stated in the report. "Except perhaps for CBD. That's a bit of an anomaly."

In sum, there remains little hard data on the current size or growth rate of the U.S. CBD market. Whether the coronavirus will have a positive or negative impact on the market also remains to be seen, with many unknowns and a significant distance to travel before the pandemic is contained and resolved in America. What is clear is that the CBD market needs to expand significantly to absorb the large inventory of hemp-derived extracted products that are currently on hand, not to mention any new production planned for 2020.

Ultimately, the most significant impact of COVID-19 on the U.S. CBD market may be an even longer delay in the U.S. Food and Drug Administration's (FDA) rulemaking, as the agency's immediate focus must be on approving drugs and vaccines that can fight the pandemic. The projected growth of the CBD market remains largely dependent upon the FDA promulgating rules and regulations that will provide clear guidance on whether and how companies can utilize and market CBD in food, beverages, and dietary supplements. Until there are clear guidelines from the FDA, most major consumer packaged goods, nutraceutical, and dietary supplement companies will not incorporate CBD into their product lines, and traditional retailers will refrain from selling ingestible CBD products.

### Industry Updates

#### ***National Pet Supply Chain to Begin Carrying CBD Products***

PetSmart, the nationwide pet supply retail chain, announced it will start carrying hemp-derived CBD products for dogs and cats at select stores across the U.S. According to a May 13 [press release](#) from Mary's Tails products, part of Mary's Brands, the company's CBD pet products are the first hemp extract brand to be sold by PetSmart. The CBD products will initially be carried by 122 PetSmart stores in Colorado, Oregon, Indiana, Kentucky, and Tennessee, with plans to expand to additional stores across the U.S. by this summer.

#### ***New Hemp-Specific Harvester Developed***

Nebraska-based company FarmMax has unveiled a new hemp-specific harvesting machine, called the Interceptor. According to a report from [Farm Progress](#), the device can be attached to several models of John Deere combines and is designed to harvest all of the hemp plant's main components: flower, seed, and stem.

#### ***Charlotte's Web Secures Second Hemp Genetics Patent***

Charlotte's Web, the Colorado-based company known for its hemp-derived extracts, has earned its second U.S. patent for hemp genetics. The new hemp variety, 'CW1AS1' was created by company co-founder Joel Stanley and Senior Director of Cultivation R&D Bear Reel, according to a late May [press release](#). Charlotte's Web's flagship Original Formula was the first CBD wellness product to be sold nationally to consumers.

**FEDERAL  
REGULATORY  
UPDATE**



### Federal Regulatory Update

#### *USDA Deems Hemp Ineligible for Coronavirus Food Assistance Program, Reassessment Possible*

[Marijuana Moment](#) reported that a May 19 announcement from USDA excluded hemp and several other commodities from its Coronavirus Food Assistance Program (CFAP), a \$19 billion relief program that includes direct support to agricultural producers, as well as the Farmers to Families Food Box Program. According to the notice, hemp was ineligible for CFAP because it was among commodities “that did not suffer a five percent-or-greater price decline from mid-January 2020 to mid-April 2020.” USDA stated initially that hemp’s ineligibility for CFAP was final and would not be reviewed.

Soon after the Marijuana Moment article was published, however, the USDA revised its CFAP notice to say that the agency “may reconsider the excluded commodities if credible evidence is provided that supports a five percent price decline.” Jonathan Miller, general counsel for the U.S. Hemp Roundtable, stated to Marijuana Moment, “We have seen in the past six, seven, eight months, a sharp decline in hemp prices,” a statement in line with Hemp Benchmarks’ own reporting of steep downturns in wholesale prices for various hemp products.

Why hemp was excluded from the CFAP despite evidence of price declines is uncertain. However, it is possible that the reason could be simply that most hemp grown in the U.S. is for CBD production, not for making hemp food products, while CFAP is a food assistance program. Our reporting indicates that only a very small percentage of hemp farmers in the U.S. are growing the crop to produce food products, such as hulled hemp seeds or food oil pressed from hemp seeds, though that segment of the U.S. market appears as if it will expand this year. An inquiry sent to USDA asking

why hemp was excluded from the CFAP was not returned by our publication deadline.

#### *USDA Guidelines for Hemp Business Loans*

In a recent [Hemp Market Insider](#) post, we examined a new set of guidelines on issuing loans to hemp businesses released last month by USDA. The guidelines are being seen by industry analysts as another sign of how the nation’s hemp sector is being integrated into the agricultural mainstream.

Daniel Mooney, assistant professor of agricultural and resource economics at Colorado State University, believes the new FSA guidelines will assist the hemp sector’s financial interests in the long run. “Many hemp growers are primarily producers of other agricultural crops or specialty products,” he said during an interview with Hemp Benchmarks, “and lenders have so far been unable to address capital and credit needs specific to the hemp enterprise. If growers are successful in executing their hemp business plans under FSA financing, it is likely that some conventional lenders who are sitting on the sidelines will begin offering similar services.”

[Read the full article.](#)

#### *Native American Tribes & Hemp*

The USDA in May approved the hemp programs of five additional Native American tribes. As we discussed in a [Hemp Market Insider](#) post earlier this month, more than 20 Native American tribes have had their hemp production plans approved by the federal government.

“A lot of tribes have significant land bases,” Aaron Fournier, co-founder of Native American Hemp, an Oklahoma-based company

that works with tribes to assist their entry into the hemp sector, told Hemp Benchmarks. “A lot of tribes also historically have grown their own crops, have a good relationship with the earth, and good sustainable farming practices – and really all the things that are needed in the hemp industry to grow high-quality hemp products.” Many Native American nations interested in hemp are reportedly also looking for business partnerships with other tribes, as well as non-Native entities.

[Read the full article.](#)

### ***FDA & CBD***

The U.S. Food and Drug Administration (FDA) recently issued notices about the voluntary recall of several CBD products. In mid-May, Florida-based Summit Labs recalled one of its CBD tinctures after the Florida Department of Agriculture and Consumer Services tested a random sample and found high levels of lead, according to a [notice](#) from FDA.

Also in May, Seattle-based Biota Biosciences announced a voluntary recall of several injectable CBD products after receiving a warning letter from the FDA in April. Those products were reportedly being marketed as alternatives to opioids. “The opioid crisis continues to be a serious problem in the United States, and we will continue to crack down on companies that attempt to benefit from selling products with unfounded treatment claims,” FDA Principal Deputy Commissioner Amy Abernethy said in that [letter](#).

“There are many unanswered questions about the science, safety, effectiveness and quality of unapproved products containing CBD,” she continued, “and we will continue to work to protect the health and safety of American consumers from products that are being marketed in violation of the law.” While there have been some signals that the FDA may be working toward a path to regulate CBD

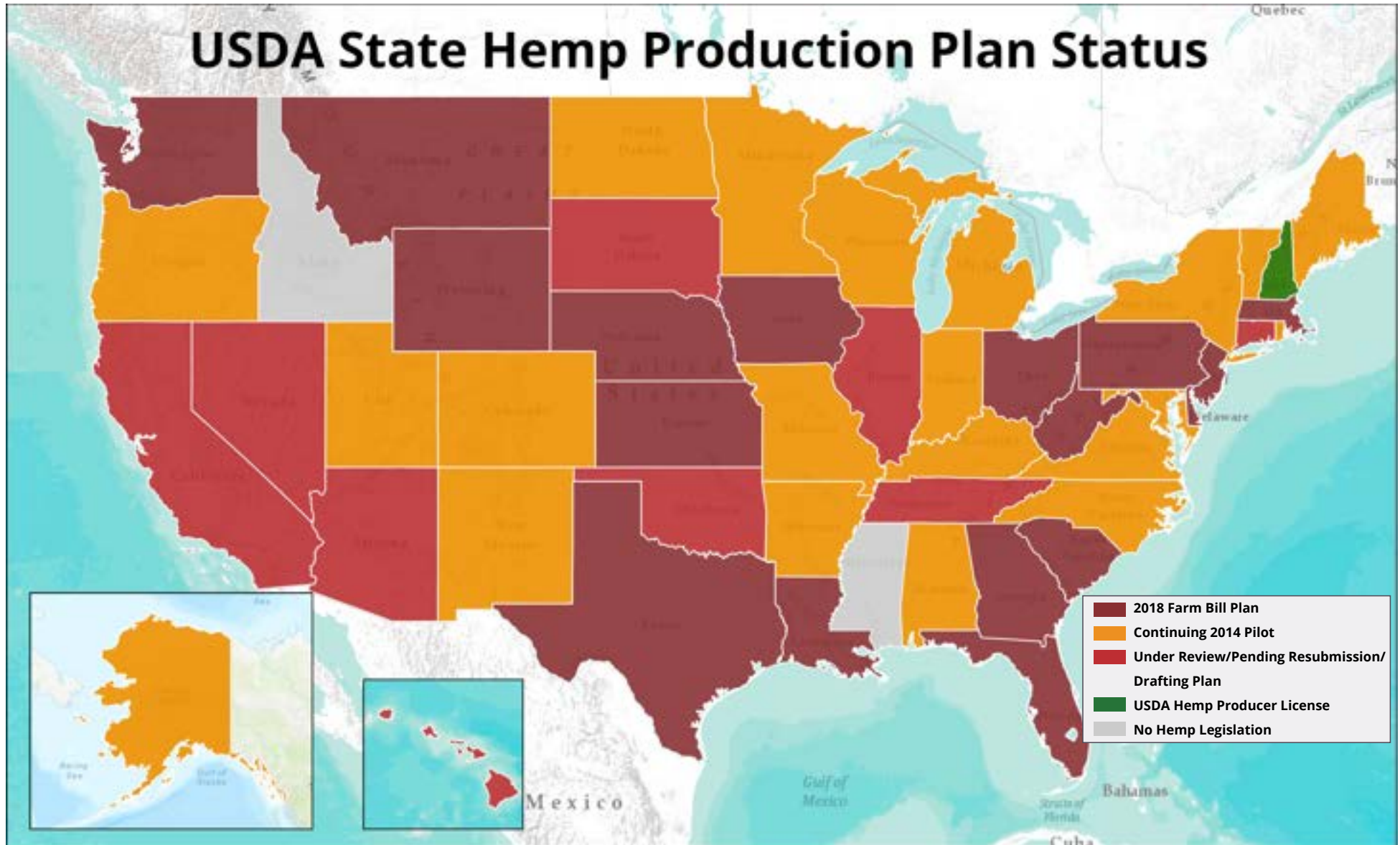
as a dietary supplement, the statements and actions just noted indicate that the agency is at the moment maintaining its stance that CBD is not a supplement and cannot be marketed as such.

# STATE UPDATES

ARKANSAS  
AGRICULTURE  
DEPARTMENT







# HEMP BENCHMARKS®

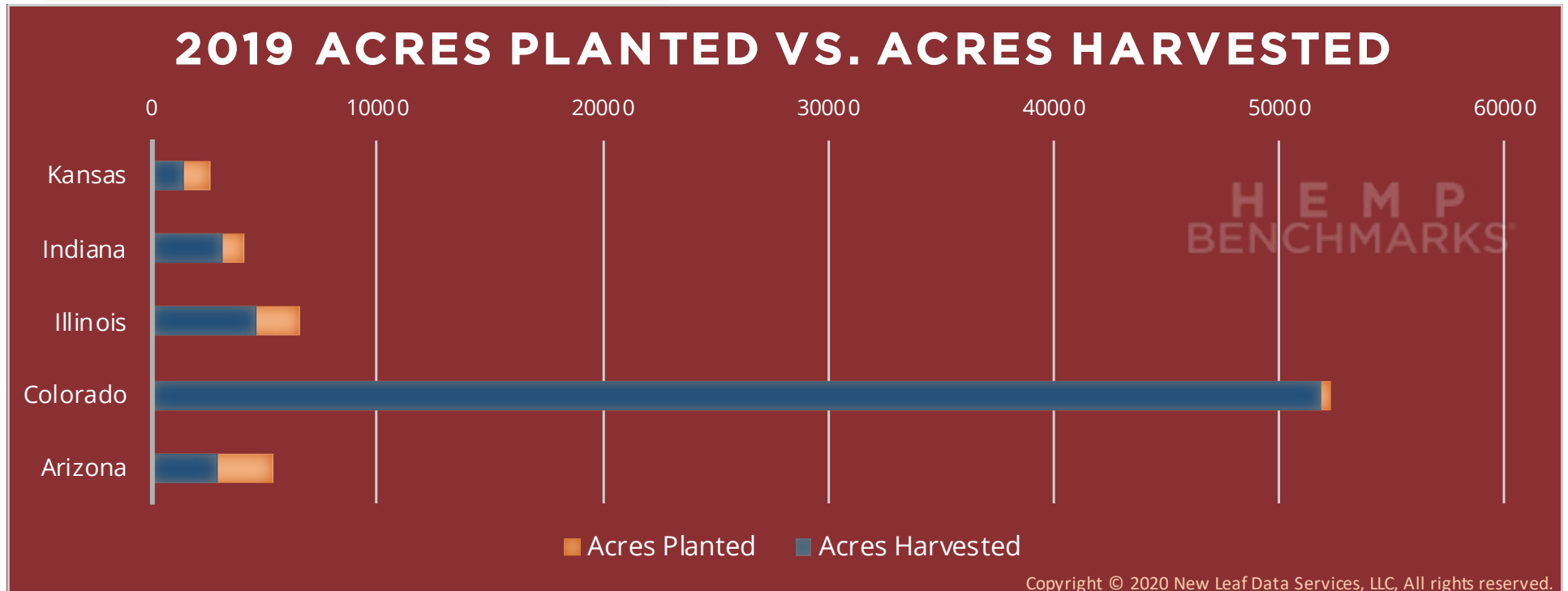
## U.S Wholesale Hemp Price Benchmarks

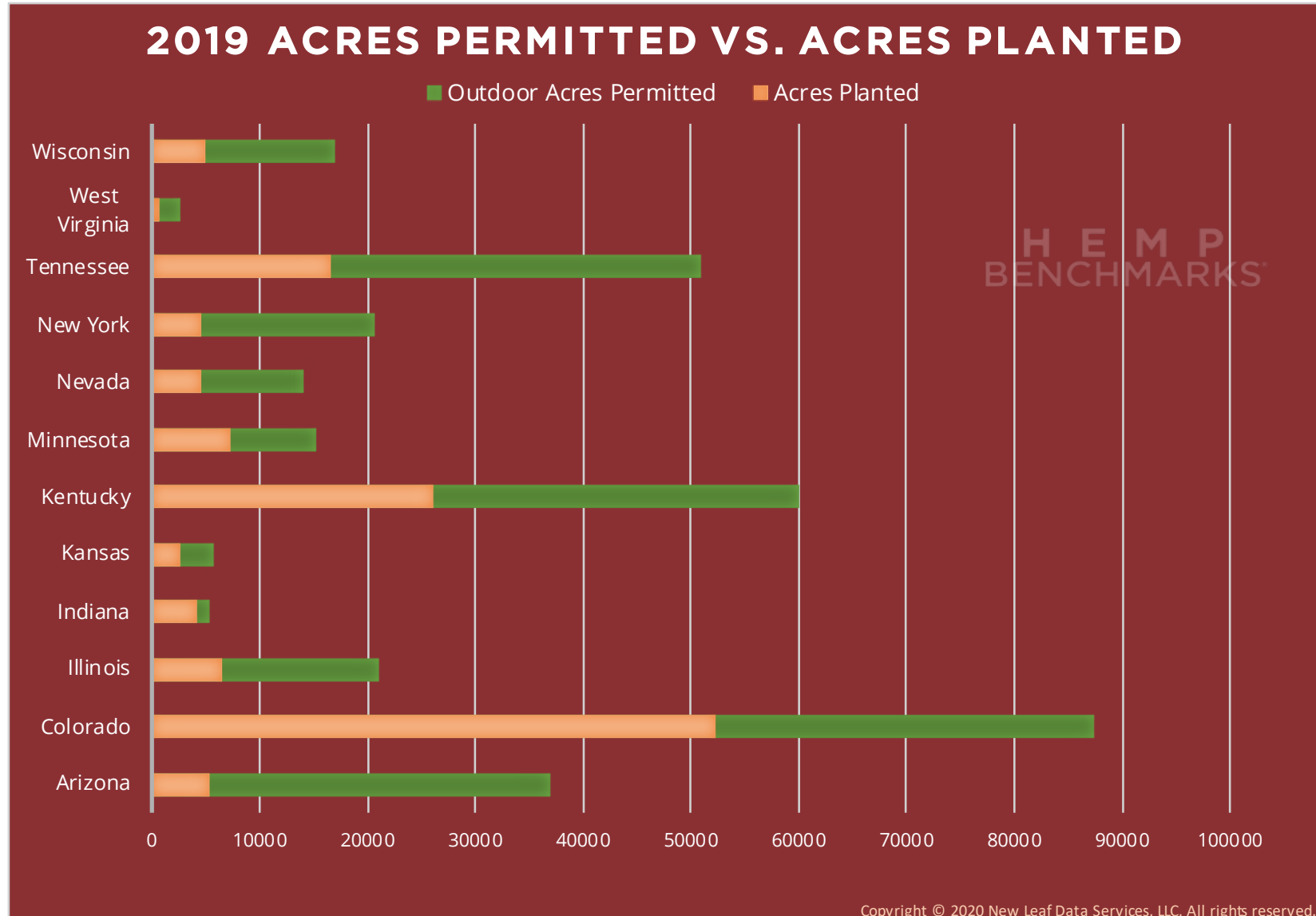
May 2020

While the proportion of Colorado's planted acres that were harvested is extremely high, state agriculture officials have stated to Hemp Benchmarks that some farmers did not turn in their reports and they suspect the overall crop failure rate was higher. Arizona may well have seen over 70% of planted acreage harvested, but a significant portion of the state's crop was destroyed because of non-compliant THC levels. Illinois' high percentage of planted acres harvested belies the fact that only about 30% of registered acres were planted and state data indicates yields were generally low.

State	Acres Planted	Acres Harvested	Percent Harvested
Arizona	5,430	2,923	53.83%
Colorado	52,275	51,851	99.19%
Illinois	6,524	4,676	71.67%
Indiana	4,090	3,126	76.43%
Kansas	2,600	1,427	54.88%

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### State Updates

Below are updates on developments in industrial hemp and CBD production, market formation, legislation, and regulation at the state level.

#### Arkansas

A May 10 report from the [Arkansas Democrat Gazette](#) notes that the state's industry is set to expand "a bit" in 2020, despite challenging experiences for farmers in 2019. As of the time of the report, the Arkansas Department of Agriculture (ADA) had licensed 152 growers for 2020, compared to 125 in 2019. 39 processors are also licensed for 2020, up from 33 last year.

The Democrat Gazette points to a survey by the ADA, in which 94% of hemp growers reported losing money on the crop in 2019. According to the survey, the respondents reported capital investments of more than \$5.8 million, with total operating costs at \$5.9 million. However, sales to processors amounted to less than \$846,000.

In 2019, Arkansas hemp farmers reportedly planted 1,819 acres, but only harvested 833 acres. Some major factors behind the low planting to harvest ratio were caterpillar infestation and severe spring rains that delayed the start of 2019's growing season, according to the Democrat Gazette.

#### California

According to a May 11 report from [CalCoastNews.com](#), the Board of Supervisors in San Luis Obispo County has voted in favor of a hemp cultivation ordinance that would require the crop to be grown on sites of at least 400 acres, with 2,000 foot setbacks, as well as mandating that hemp operations be located at least a mile from any community's urban reserve line. The report states that the measure will scale back or end every hemp grow operation in

the county.

#### Colorado

On May 20, the state Marijuana Enforcement Division (MED) issued a "[Compliance Tip](#)" ahead of industrial hemp products being allowed to be sold in licensed adult-use and medical cannabis retailers for the first time, beginning July 1.

Rules regarding the sale of hemp products in licensed cannabis stores include:

- Industrial hemp flower, trim, or other plant material is not permitted to be sold.
- Only manufactured food and storage facilities registered with the Colorado Department of Public Health and Environment can provide industrial hemp products to licensed cannabis retailers or processors.
- Industrial hemp products sold in licensed cannabis retailers must pass required testing, performed by a licensed cannabis testing facility in the state. Required testing includes potency, microbial contaminant, residual solvent (if applicable), and metals contaminant screenings.
- Industrial hemp products will be entered into Metrc, the state's cannabis plant and inventory tracking system, when they are submitted for required testing.
- Licensed cannabis processors are prohibited from accepting and/or processing industrial hemp plant material. However, they may incorporate hemp-derived cannabinoids as an ingredient in manufactured cannabis products.

#### Florida

Holly Bell, Director of Cannabis at the Florida Department of Agriculture and Consumer Services (FDACS), provided an update to

Hemp Benchmarks on the state's initial licensing of hemp cultivators early this month. FDACS opened applications for the state's first hemp cultivation licenses on Monday, April 27. By Friday, May 1, the department had already received 817 applications and approved 123 hemp cultivation licenses, according to Bell. The rush to secure a cultivation license in Florida's first season of legal hemp growing indicates significant enthusiasm in the state for the crop.

### Indiana

Don Robison, Seed Administrator at the Office of Indiana State Chemist & Seed Commissioner (OISC) provided an update on licensing in his state for the 2020 season. As of May 18, Robison reported that OISC had issued 267 total licenses; 233 for growers or grower/handlers and 34 for handlers only.

- 8,919 acres have been licensed for outdoor production;
- 1.73 million square feet licensed for indoor production;
- 655 individual growing sites have been registered;
- 446 for CBD hemp;
- 18 for seed production;
- 31 for grain;
- 40 for fiber;
- three for seed oil;
- And 117 for "other" purposes, which includes smokable hemp, CBG, and grain for feeding trials.

Robison added in an email, "It's interesting to see so much smokable hemp production where our law clearly forbids it, there is currently a stay order on that portion of the law by a federal judge so it looks like the growers and lawyers consulting with them believe the stay will be upheld and that part of the law will be struck down."

Indiana farmers registered 5,300 acres for hemp cultivation in

2019, planting about 4,200 acres and harvesting around 3,300. Roughly 1.5 million square feet of indoor production were also licensed in 2019, but only about 367,000 square feet were ultimately harvested, according to Robison.

### Kentucky

The state's agriculture department has approved the use of several "minimum risk" pesticides by hemp farmers for the 2020 season, according to a May 6 report from the [Messenger-Inquirer](#). [Minimum risk pesticides](#) are defined by the Environmental Protection Agency (EPA) as posing "little to no risk to human health or the environment." The EPA has exempted such pesticides from the requirement that they be registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Minimum risk pesticides are also the only ones legally available for use by state-licensed cannabis cultivators, as the federal prohibition on cannabis - and hemp, until recently - has prevented FIFRA-regulated pesticides being labeled for use on the plants.

### Maine

Mary Yurlina, of the Maine Department of Agriculture, Conservation and Forestry (MDACF), told Hemp Benchmarks on May 18 that the state changed its hemp licensing process this year. Now, there is no application deadline for growers. Most of Maine's hemp farmers grow outdoors, Yurlina stated, and can apply for a license up to a few weeks prior to planting, which means that MDACF may still be receiving license applications as late as in June.

However, Yurlina stated in an email, "I would say we expect fewer licenses this year (~120 compared to 180 last year) and I can tell you that land area per license is much reduced this year as well."

### Montana

Montana hemp growers have voted to establish a 1% checkoff for hemp, making them the first in the nation to do so, according to a

late April [press release](#) from the state Department of Agriculture. Money collected in agricultural checkoff programs is used to fund activities related to research, market development, and education.

Those intending to farm hemp in Montana have until June 1 to apply for a license.

### Oregon

A May 21 report from the [Capital Press](#) states that some hemp varieties from Oregon may soon be certified by the national Association of Official Seed Certifying Agencies (AOSCA). The report quotes Andrew Altishin, head of the Oregon Seed Certification Service at Oregon State University, as stating that numerous varieties are currently awaiting review and approval from AOSCA. Current guidelines for certification of seed for CBD-rich varieties include a germination rate of at least 85%, along with 99.9% feminized plants.

### Pennsylvania

The Pennsylvania Department of Agriculture (PDA) recently published a document titled, "[2020 Hemp Varieties of Concern and Prohibited Varieties](#)." The document "lists hemp varieties which were grown in Pennsylvania during 2017, 2018 or 2019, and have had, in one or more instance [sic], a THC test result of above 0.3%." 13 varieties are listed as prohibited in the state, along with several dozen "varieties of concern," which have tested above 0.3% THC, but are not prohibited at this time.

PDA states, "Applicants for Pennsylvania's Hemp Permit shall review this list of hemp varieties before sourcing, purchasing, and acquiring the hemp seed, clones, propagules or cuttings which they will be growing in 2020, and shall ensure that they comply with all the requirements of Pennsylvania's General Hemp Permit."

### Tennessee

According to Kim Doddridge, Public Information Officer at the state's Department of Agriculture (TDA), "Tennessee hemp licenses expire June 30 and TDA will have clearer data after then in regards to licensed acreage," she wrote in an email. Doddridge also noted that weather has been "challenging" for outdoor farmers in Tennessee this spring. "Tornadoes, winds, and rain have presented challenges for some," she said. "Planting season is typically around this time of year but each farmer assesses his/her own fields for when is best to plant that crop."

Another TDA representative stated in an email to Hemp Benchmarks that the state does expect to see a reduction in the acreage licensed for hemp cultivation this year, but the exact scope of the decrease is not yet known. In 2019, Tennessee registered about 51,000 acres for hemp farming, the fourth highest amount of any state, but only 17,000 acres were ultimately planted.

### Texas

Texas A&M AgriLife, a partnership between Texas A&M University and four state agencies focused on agriculture and life sciences, is for the first time planting hemp variety trials this spring, according to a late April article in [AgriLife Today](#). The goal of the trials is to provide "producers, hemp seed companies and the larger hemp industry with a reliable, independent scientific assessment of hemp varietal performance in Texas."

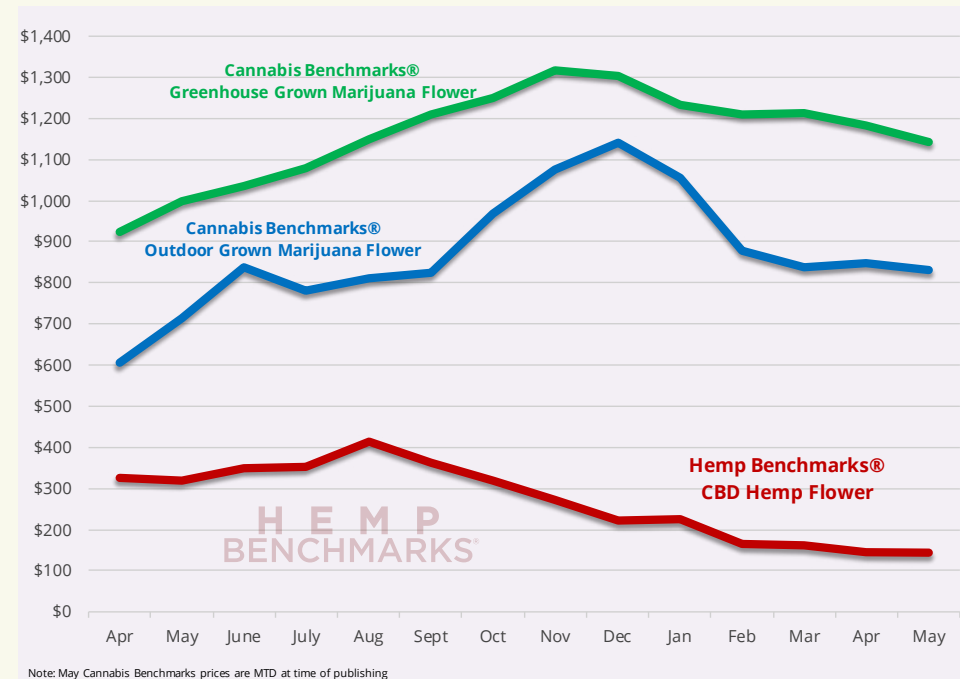
"Trial results for crops tested by Texas A&M AgriLife are used by farmers across Texas to make decisions on their planting seed," Larry Redmon, Ph.D., AgriLife Extension program leader for the Department of Soil and Crop Sciences and associate department head, told the publication. "Our goal is that Texas hemp producers may enjoy the same type of information for their seed selection decisions."

Texas has also proposed new rules for hemp and CBD products, according to a May 8 [press release](#) from the Natural Products Association (NPA). The proposal released by the Texas Department of State Health Services is intended to create rules related to:

- The manufacturing, processing, and distribution of consumable hemp products;
- The testing of consumable hemp products, by implementing testing and sample analysis;
- The retail, possession/distribution/sale, packaging, labeling requirements, and transportation of products;
- Registration for retailers, and enforcement thereof.

NPA states that Texas is the second state to create its own CBD legislation; Virginia was the first, a development that we noted in last month's Hemp Benchmarks report.

### U.S. Spot Price Comparison - Hemp Flower vs. Marijuana Flower (\$/pound)



### PRODUCT DEFINITIONS

#### **CBD BIOMASS**

Dried hemp plant materials including the stalks and leaves that may include flowers/buds and/or seeds that have been harvested. Free of mold, grit, minimal (< 0.1%) non-hemp organic matter, and at least 80% dry. An industry-wide acceptable moisture content is necessary to establish uniform pricing for hemp biomass. Any hemp biomass material that is above the standard moisture content will result in decreased value and an adjusted sale price to reflect a lower volume of the end product to account for further water evaporation. Biomass can also be milled, ground or pressed into pellets.

#### **CBG BIOMASS**

Dried hemp plant materials from cultivars that primarily produce cannabigerol (CBG) with the same specifications described above in regard to CBD Biomass.

#### **DRIED CBD FLOWER**

Dry flower is the dried flower and bud fraction of a hemp plant that has been removed from the stalks and contains minimal stems. Flower is suitable for smoking and for use in pre-rolled joints.

#### **CBD/CBG CLONES**

A clone refers to a plant that is an exact reproduction of an original parent plant, known as a mother plant, through asexual propagation. A clone is made by taking a stem cutting (or tissue culture) from a mother plant and placing the cutting into media to facilitate root growth. Once the roots begin to grow, the clone is transplanted into a field or cultivation facility. Hemp clones are genetically predisposed to high CBD and/or high CBG content and are sold as such.

#### **INDUSTRIAL SEEDS**

Industrial hemp seeds comprise a broad range of hemp cultivars used to grow hemp biomass, hemp seed and grain for food oils and food products, and fiber for woven and non-woven applications.

#### **CBD SEEDS (Non-Feminized)**

Hemp plants that are pollinated naturally or with traditional breeding techniques produce both male or female seeds. These are known as regular, or non-feminized, seeds and generally result in an even split between the two sexes.

#### **CBD/CBG SEEDS (Feminized)**

Feminized seeds are seeds that have been modified to produce almost 100% female plants. There are a few techniques that can produce reliably feminized seeds. Feminized hemp seeds can be genetically modified to produce only female plants by eliminating the Y chromosome. A non-genetic technique is to stress a healthy female plant by interrupting its light cycle during flowering. Another common and controlled method is to spray female plants with a colloidal silver or silver thiosulphate solution.

#### **CRUDE HEMP OIL**

Crude hemp oil is extracted from the hemp plant and contains all of the cannabinoids, terpenes and other plant compounds found in the biomass. Processors use a number of different methods to extract crude oil from hemp. Supercritical CO2 extraction uses pressurized carbon dioxide (CO2) to pull CBD (and other phytochemicals) from the plant. Solvent extraction uses ethanol or hydrocarbons, such as butane or propane, to process hemp biomass into crude oil. Other processes use olive oil or water as a solvent. Crude hemp oil is often "winterized." Crude oil is winterized to remove organic plant compounds, such as lipids, waxes and chlorophyll, that increases the potency of the oil and creates a more transparent distillate.

#### **REFINED HEMP OIL**

Crude hemp oil is further refined through distillation to produce refined hemp oil, which includes full spectrum oil, broad spectrum oil, and THC Free Distillate.

**CBD full spectrum oil distillate** is refined hemp oil extract that contains all the compounds found naturally occurring in the plant, including all the cannabinoids, terpenes and essential oils.

**CBD broad spectrum oil distillate** is refined hemp oil extract with various plant material, cannabinoids or terpenes that have been partially or fully removed.

**CBG distillate** is refined hemp oil extract with various plant material, cannabinoids or terpenes that have been partially or fully removed.

**THC Free Distillate** is a broad spectrum oil distillate that has had all THC components removed using advanced techniques such as chromatography.

#### **CBD/CBG ISOLATE**

Isolate is the purest form of a cannabinoid, which is produced by removing all other compounds found in the plant including terpene, flavonoids, plant parts and other cannabinoids. Isolate comes in a granular or powder form and is odorless and tasteless. The end product contains 0% THC and is made up of 96% to 99.9% CBD or CBG, respectively.



May 21, 2020


Jonathan Miller, General Counsel  
U.S. Hemp Roundtable  
Capitol Riverfront 100 M Street, S.E. Suite 600  
Washington, DC 20003

Dear Jonathan:

In support of the burgeoning US industrial hemp market, I'd like to offer the following data points to illustrate the difficulties facing growers and processors. Since July 2019, the average price of biomass across the country fell precipitously for six months. Specifically, the midpoint of prices fell 84 percent.

Many growers were unable to sell biomass at harvest time, so to preserve the quality of their crops, they entered into tolling agreements to process the biomass into crude oil or further refined products. The industry-standard contract structure requires hemp producers to pay a processing fee that would be paid on a profit-sharing percentage as soon as the processor sold the (semi) refined product. It is our understanding that many growers are still awaiting payments for their 2019 crop. Not surprisingly, using Colorado as a national benchmark as it is arguably the nation's most active market participant in terms of both growing and processing, prices for processed hemp fell 21% to 32% between January 2020 and April 2020 as follows:

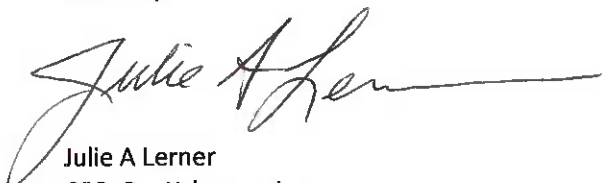
Note that PanXchange publishes its benchmark prices on the last Wednesday of every month, averaging price inputs from the entire month, which is sufficient in a burgeoning market such as hemp. As such, the month end average of prices in January for Winterized crude oil was \$550 per kilogram and the end April price was \$375 per kilogram. Additional information on historical prices may be made available upon request.

 THE FUTURE OF COMMODITIES <sup>™</sup> © 2020 PanXchange, Inc.		Percent Price decline end January 2020 to end April 2020
Colorado Winterized crude		32%
Colorado Full Spectrum Distillate		21%
Colorado Broad Spectrum Distillate		31%
Colorado Isolate		30%

PanXchange, Inc. is a market structure solution for physical commodities that feed and fuel the world. We were the first and now the leading benchmark price provider in US industrial hemp, issuing our first suite of benchmark prices in January 2019. In August 2019, we launched the industry's first institutional grade trading platform for growers, processors, trade houses, and end-users to manage their physical deal flows. All PanXchange benchmark prices come from this group of vetted platform members. The benchmarking methodology follows [IOSCO](#) guidelines, and every data point has a clear audit trail.

I am the Founder and CEO of PanXchange, Inc., and I designed the trading platform based on my background as a former physical commodity trader. I began my career with Cargill, International in Geneva, Switzerland, and later became their senior trader for Latin American sugar. I've also been in the US energy industry with Sempra Energy Trading and US agricultural weather derivatives with XL Financial. As such, I have a tremendous appreciation in the need for accurate benchmark pricing in nascent markets such as hemp and stand behind the data that our team has recorded.

Sincerely,

  
Julie A Lerner  
CEO, PanXchange, Inc.