

HEMP BENCHMARKS®

U.S Wholesale Hemp Price Benchmarks

April 2022

HEMP BENCHMARKS® U.S. PRICING CATEGORIES



GENETICS

- Industrial Seeds
- CBD Seeds (Non-Feminized)
- CBD Seeds (Feminized)
- CBD Clones
- CBG Seeds
- CBG Clones



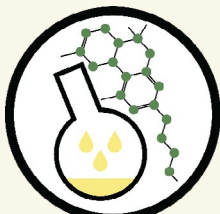
FARMING

- CBD Biomass Aggregate Pricing
- CBD Biomass Volume Purchase Breakdown
- CBD Flower
- CBG Biomass



EXTRACTION

- Crude CBD Hemp Oil



PROCESSING

- Refined Hemp Oil (Aggregate)
- CBD Distillate - Full Spectrum
- CBD Distillate - Broad Spectrum
- CBD Distillate - THC Free
- CBD Isolate
- CBG Distillate
- CBG Isolate

U.S. Region Products	Units	Assessed Price	Low	High
CBD Biomass (Aggregate)	\$ / % CBD / pound	\$0.34	\$0.05	\$0.93
CBD Biomass (0 - 25K pounds)	\$ / % CBD / pound	\$0.50	\$0.20	\$0.93
CBD Biomass (25K - 100K pounds)	\$ / % CBD / pound	\$0.32	\$0.15	\$0.65
CBD Biomass (100K - 1M pounds)	\$ / % CBD / pound	\$0.17	\$0.10	\$0.23
CBD Biomass (1M+ pounds)	\$ / % CBD / pound	\$0.09	\$0.05	\$0.12
CBD Flower (Bulk)	\$ / pound	\$218	\$50	\$800
CBD Clones	\$ / each	\$2.70	\$1.50	\$3.75
Industrial Seeds	\$ / pound	\$4.02	\$3.75	\$4.25
CBD Seeds (Non-Feminized)	\$ / pound	\$153	\$70	\$300
CBD Seeds (Feminized)	\$ / seed	\$0.78	\$0.24	\$1.75
Crude CBD Hemp Oil	\$ / kilogram	\$122	\$55	\$250
Refined Hemp Oil (Aggregate)	\$ / kilogram	\$445	\$175	\$2,472
CBD Distillate - THC Free	\$ / kilogram	\$748	\$250	\$2,472
CBD Distillate - Broad Spectrum	\$ / kilogram	\$440	\$250	\$800
CBD Distillate - Full Spectrum	\$ / kilogram	\$344	\$175	\$700
CBD Isolate	\$ / kilogram	\$376	\$225	\$514
CBG Biomass (Aggregate)	\$ / % CBG / pound	\$0.38	\$0.16	\$0.80
CBG Seeds	\$ / seed	\$0.86	\$0.50	\$1.40
CBG Clones	\$ / each	\$2.61	\$1.50	\$3.80
CBG Distillate	\$ / kilogram	\$690	\$350	\$1,200
CBG Isolate	\$ / kilogram	\$1,278	\$750	\$1,525

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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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HEMP BENCHMARKS®

U.S Wholesale Hemp Price Benchmarks

April 2022

U.S. Region Products*	Units	Mar-22	Apr-22	MoM \$Chg	MoM %Chg
CBD Biomass (Aggregate)	\$ / % CBD / pound	\$0.34	\$0.34	0%	0%
CBD Biomass (0 - 25K pounds)	\$ / % CBD / pound	\$0.51	\$0.50	(\$0.01)	-2%
CBD Biomass (25K - 100K pounds)	\$ / % CBD / pound	\$0.33	\$0.32	(\$0.01)	-3%
CBD Biomass (100K - 1M pounds)	\$ / % CBD / pound	\$0.18	\$0.17	(\$0.01)	-6%
CBD Biomass (1M+ pounds)	\$ / % CBD / pound	\$0.09	\$0.09	\$0.00	0%
CBD Flower (Bulk)	\$ / pound	\$210	\$218	\$8	4%
CBD Clones	\$ / each	\$3.02	\$2.70	(\$0.32)	-11%
Industrial Seeds	\$ / pound	\$4.08	\$4.02	(\$0.06)	-1%
CBD Seeds (Non-Feminized)	\$ / pound	\$181	\$153	(\$28)	-15%
CBD Seeds (Feminized)	\$ / seed	\$0.88	\$0.78	(\$0.10)	-11%
Crude CBD Hemp Oil	\$ / kilogram	\$119	\$122	\$3	3%
Refined Hemp Oil (Aggregate)	\$ / kilogram	\$459	\$445	(\$14)	-3%
CBD Distillate - THC Free	\$ / kilogram	\$811	\$748	(\$63)	-8%
CBD Distillate - Broad Spectrum	\$ / kilogram	\$427	\$440	\$13	3%
CBD Distillate - Full Spectrum	\$ / kilogram	\$338	\$344	\$6	2%
CBD Isolate	\$ / kilogram	\$371	\$376	\$5	1%
CBG Biomass (Aggregate)	\$ / % CBG / pound	\$0.43	\$0.38	(\$0.05)	-12%
CBG Seeds	\$ / seed	\$0.94	\$0.86	(\$0.08)	-9%
CBG Clones	\$ / each	\$2.88	\$2.61	(\$0.27)	-9%
CBG Distillate	\$ / kilogram	\$732	\$690	(\$42)	-6%
CBG Isolate	\$ / kilogram	\$1,247	\$1,278	\$31	2%

PRICE COMMENTARY

The overall assessed price for CBD Biomass was unchanged from March to April. Despite some month-on-month shifts, April's assessed aggregate price for CBD biomass of \$0.34 / %CBD / pound is off only marginally from the trailing six-month average of \$0.35 / %CBD / pound. It remains to be seen whether 2021's significantly smaller harvest relative to previous years and biomass from 2019 and 2020 becoming unmarketable will work to lift prices as the spring and summer wear on.

Prices for CBD extracts were largely stable this month, with numerous product categories even seeing small gains. However, the assessed price for THC Free CBD Distillate dropped significantly again this month and is now down 41% year-on-year.

Prices for all types of genetics were down this month, as growers in some parts of the country are already planting and others in more northerly latitudes have likely made arrangements for seeds or clones already at this point. Prices for CBD Clones and Feminized Seeds remained up year-on-year, while observed prices for industrial seeds were flat compared to a year ago.

Delta-8 & Delta-10 THC Distillate*

The observed price for Delta-8 THC Distillate declined for the tenth consecutive month, slipping 7% from March to average \$634 per kilogram this month. The

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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 temporarily employing historical correlations according to deal size in order to calculate price assessments for the aforementioned product categories.

low end of the reported price range fell to \$400 per kilogram. The high end of the observed price range also declined, to \$850 per kilogram.

Delta-10 THC Distillate averaged \$2,105 per kilogram in April, down 1% from March, when we observed a 10% month-on-month downturn. Prices for delta-10 THC have fallen each month after Hemp Benchmarks began reporting them in October 2021, but the downtrend was moderated this month. Observed deals for delta-10 THC ranged between \$1,100 and \$2,500 per kilogram this month, with the low end of the range seeing a \$200 month-on-month increase.

Smokable Hemp Flower

Assessed prices for indoor and greenhouse-grown smokable CBD Flower rose this month. Outdoor flower's price decreased slightly after a 16% jump in March.

Indoor-Grown CBD Flower (Bulk)

- Average: \$497 per pound (up 9% from March)
- Low - High: \$300 - \$800 per pound
- The average price is 128% higher than the overall CBD Flower spot price.

Greenhouse-Grown CBD Flower (Bulk)

- Average \$364 per pound (up 8% from March)
- Low - High: \$225 - \$540 per pound
- The average price is 67% higher than the overall CBD Flower spot price.

Outdoor-Grown CBD Flower (Bulk)

- Average: \$138 per pound (down 3% from March)
- Low - High: \$50 - \$300 per pound
- The average price is 37% lower than the overall CBD Flower spot price.

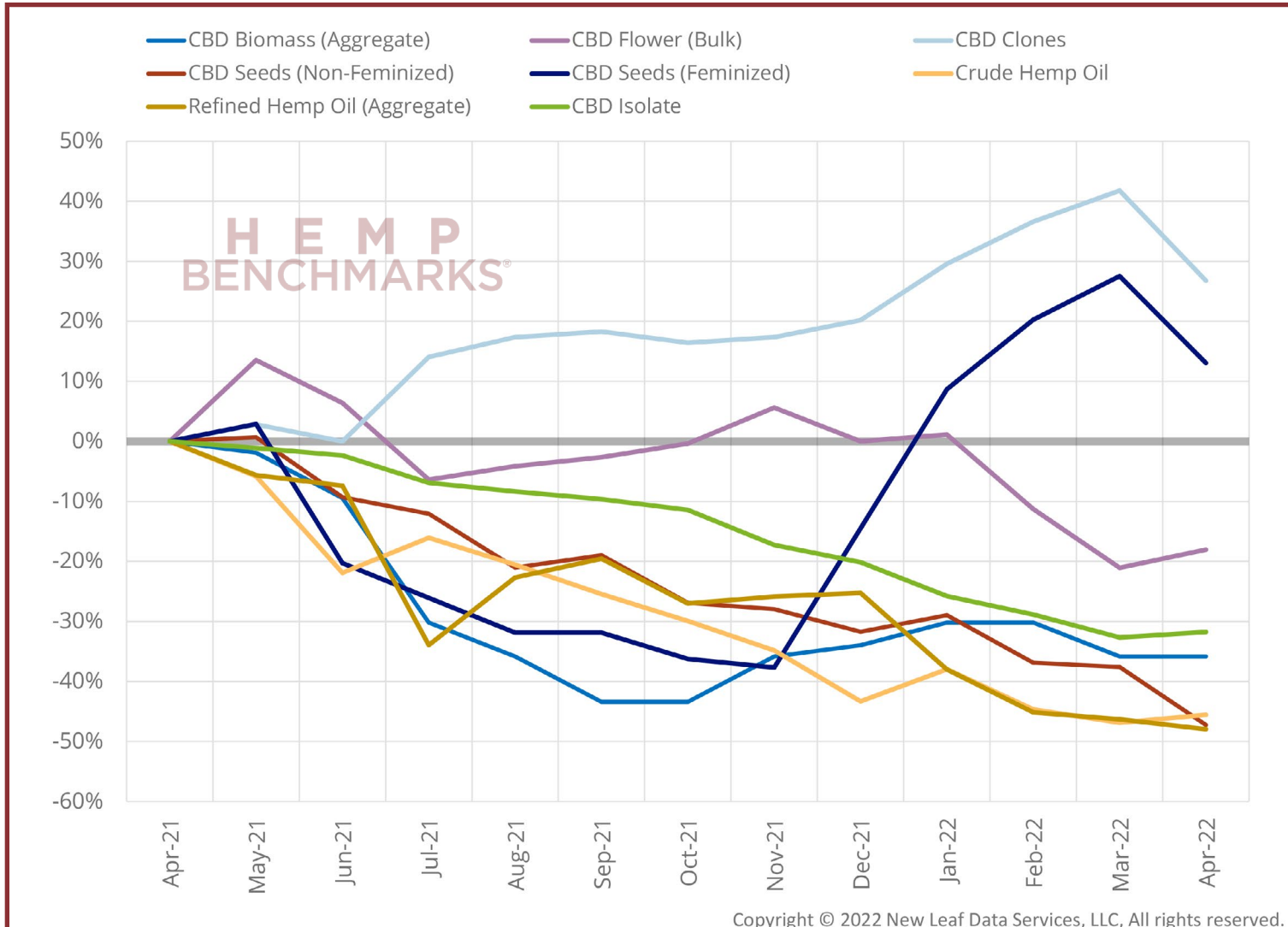
Smokable CBG Flower* prices fell 18% this month to settle at \$146 per pound. After relative stability in the latter months of 2021, prices for this product type continued to decline this year, falling well below the overall price for smokable CBD flower after several months of the two being comparable. The observed price range for individual transactions spanned from \$80 to \$350 per pound, according to our PCN.

CBN Isolate*

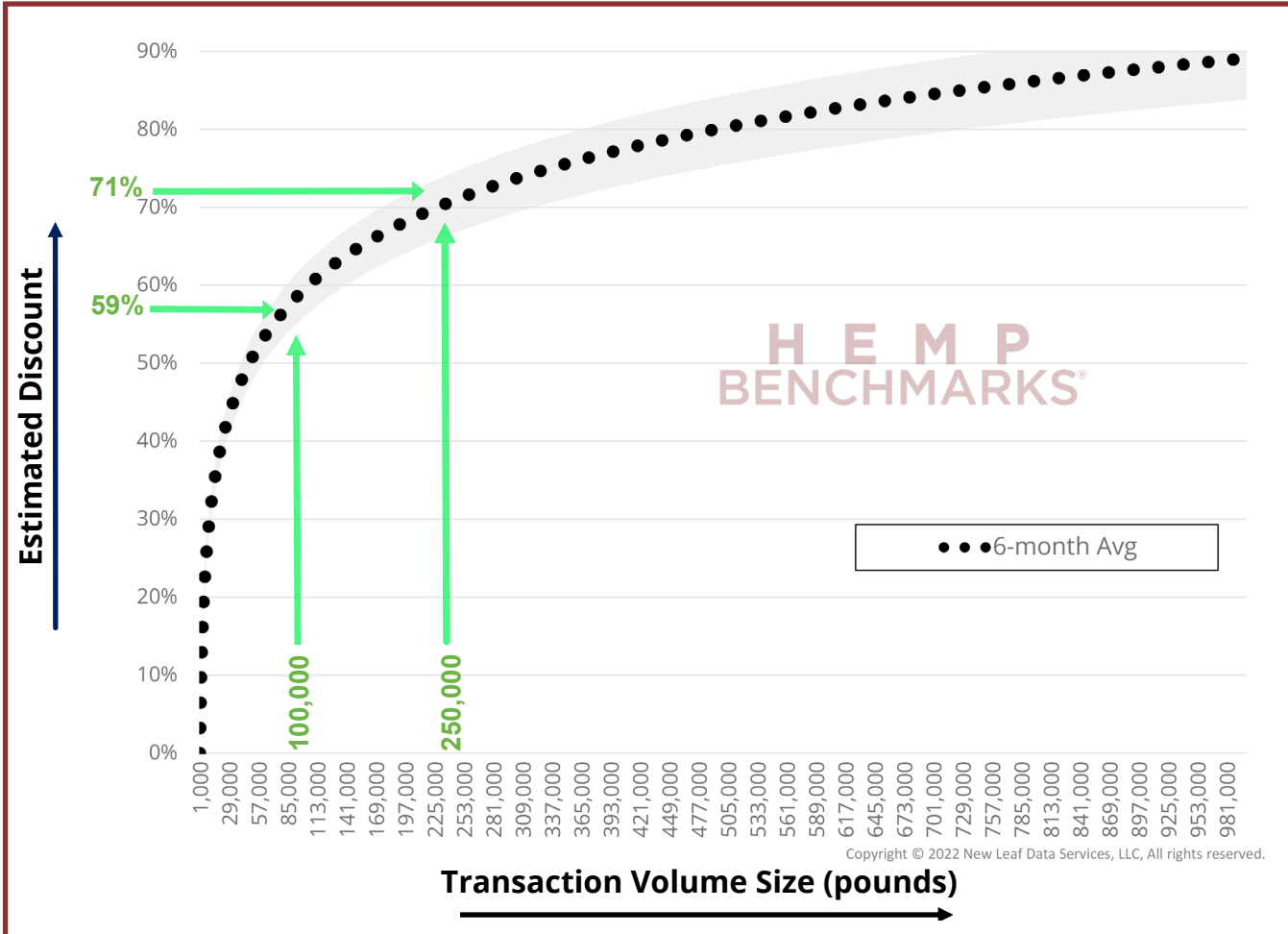
The average observed price for CBN Isolate in April was \$3,377 per kilogram, down about 1% from March. Individual transactions were reported to span between \$2,600 and \$4,000 per kilogram this month. The high end of the observed price range dropped \$200 month-on-month, after plummeting by \$1,800 in March.

*[*Editor's Note: The prices quoted above for Delta-8 THC Distillate, Delta-10 THC Distillate, Smokable CBG Flower, and CBN Isolate are raw transaction data and do not constitute official Hemp Benchmarks price assessments. Transaction data for such products is currently being vetted to meet Hemp Benchmarks methodology requirements, which include, but are not limited to, several months of statistically significant data and consistent or increasing transaction volume.]*

Prices % Change from APRIL 2021



CBD Biomass Volume Purchase Discounts (% off of a 1,000-pound transaction)



CBD 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 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.

Ask us how our pricing can help negotiate your next transaction

Wholesale Prices - Correlation Matrix: April 2019 to April 2022 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		0.65	0.88	0.30	0.95	0.80	0.93	0.99	0.99
CBD Flower (Bulk)	0.71		0.61	0.53	0.59	0.58	0.60	0.58	0.63
Clones	0.92	0.61		0.29	0.91	0.83	0.83	0.87	0.88
Industrial Seeds	0.28	0.53	0.29		0.17	0.41	0.17	0.28	0.26
CBD Seeds (Non-Feminized)	0.95	0.59	0.91	0.17		0.80	0.96	0.96	0.97
CBD Seeds (Feminized)	0.86	0.58	0.83	0.41	0.80		0.73	0.79	0.78
Crude Hemp Oil	0.93	0.60	0.83	0.17	0.96	0.73		0.94	0.96
Refined Hemp Oil (Aggregate)	0.99	0.58	0.87	0.28	0.96	0.79	0.94		0.99
CBD Isolate	0.99	0.63	0.88	0.26	0.97	0.78	0.96	0.99	

What does this mean?

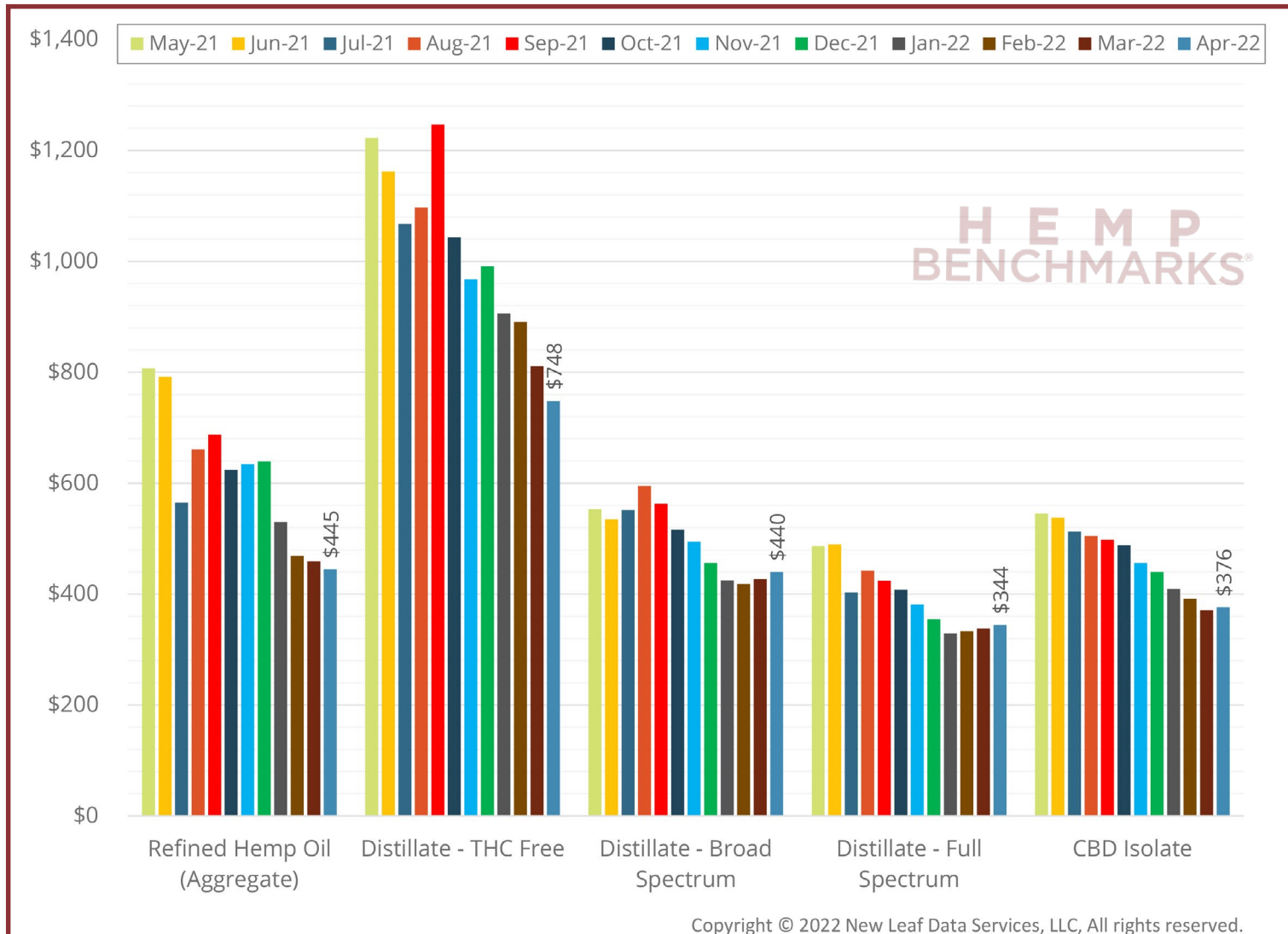
This wholesale price correlation matrix was generated from historical Hemp Benchmarks price assessments. It shows which product prices move together, move in opposite directions, or have no relationship at all. Correlations range from 1 to -1. If two products have a perfect positive correlation coefficient 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.

Example:

The correlation between Refined Hemp Oil and CBD Biomass is 0.99. 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.

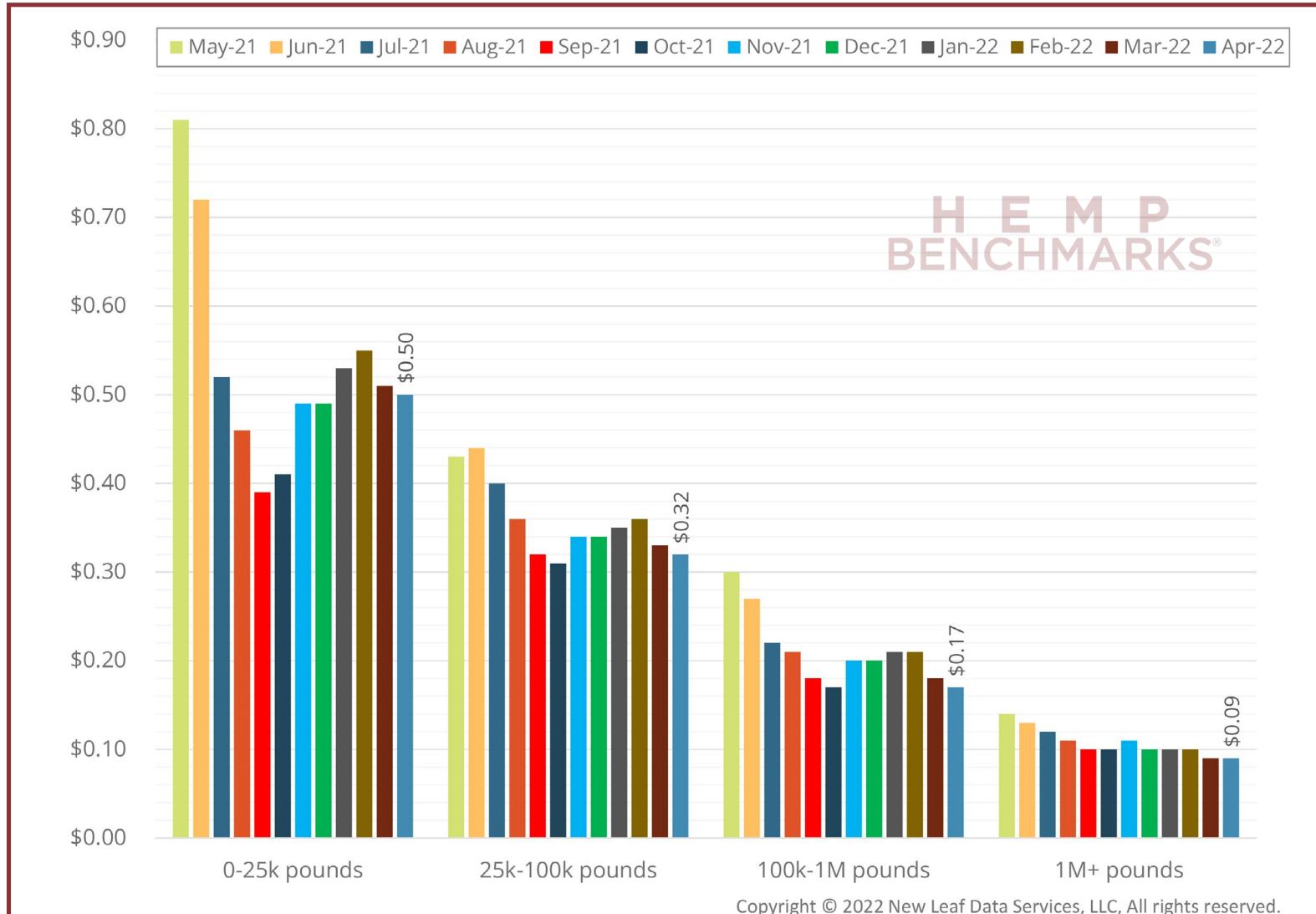


Refined Hemp Oil Pricing Trends: (\$ / kilo)

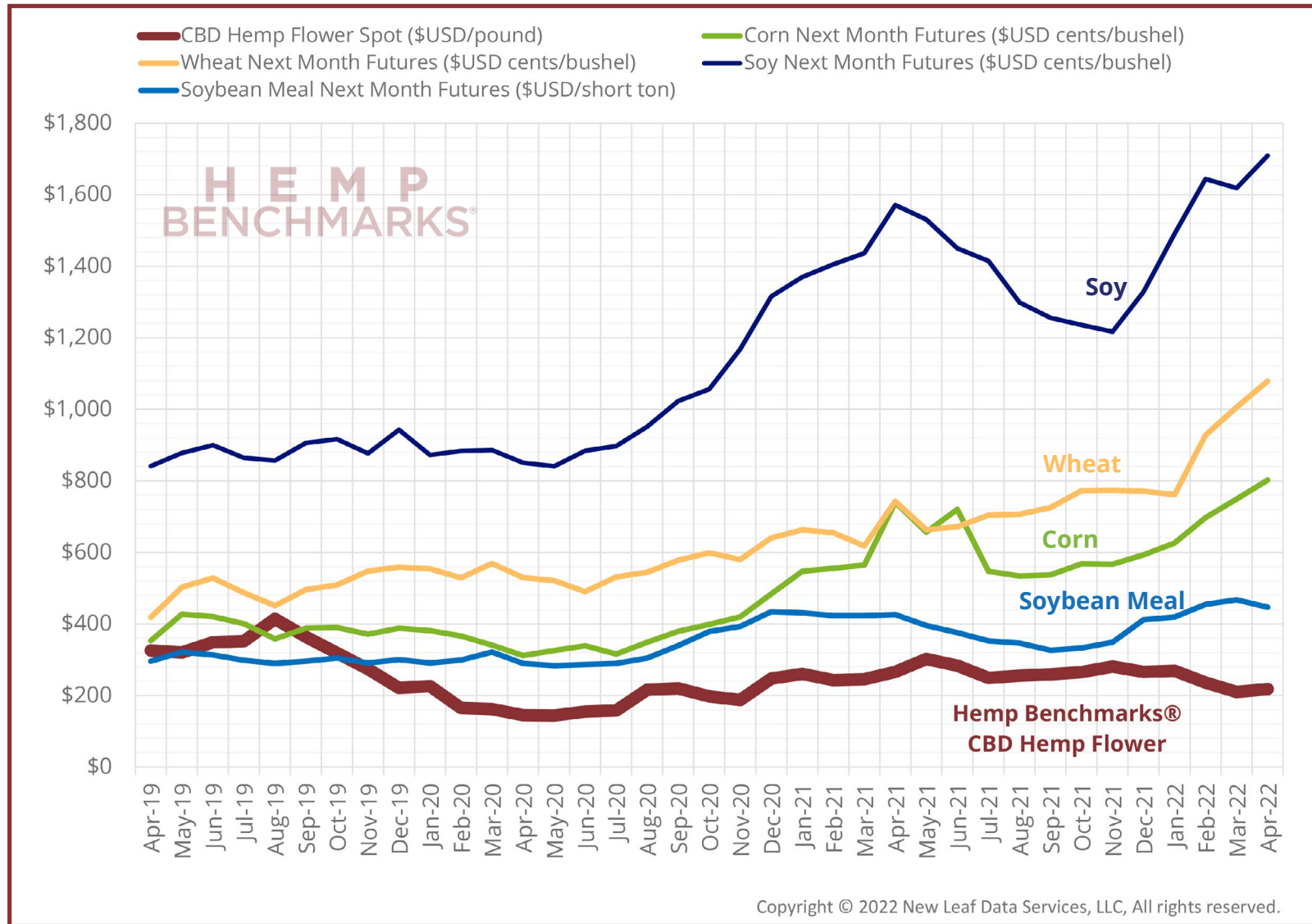


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CBD Biomass Pricing Trends: (\$ / %CBD / pound)



Hemp Pricing vs. Other Commodities April 2019 to April 2022



April Production Update

Economic uncertainties at home and abroad continue to impact the United States hemp sector as farmers in North America prepare for and commence with planting season. Many cultivators and processors continue to take cautious approach when it comes to growing hemp in 2022, due in part to a remaining glut of biomass from the “green rush” years immediately following hemp’s national legalization in 2018. Volatile markets for traditional staple crops and agricultural inputs are also forcing farmers to weigh the potential benefits and costs of planting hemp, as opposed to corn, soy, or wheat.

“We’re sitting here staring at our warehouse full of biomass,” Luke Poindexter, who co-owns Rural Route Hemp Co. near Kansas City, said during an April interview with [Feast Magazine](#). “We just slowly push through, and hopefully we’ll have plenty of product whenever [the market] takes off.”

Scaling down CBD Production

The wait for a better hemp market, however, has been long for some established cultivators. Bill Carwell, owner of Cherry Ridge Organic Hemp, a family-owned and operated farm in northeastern Arkansas, said his operation - which produces CBD smokable flower, prerolls, lotions, salves, tinctures, and other products - is still working its way through hemp harvested in the past several years, and has stopped growing a crop for now.

“In 2019 we heard about the great profitability potential and how much people made in 2018,” he told Hemp Benchmarks. “It looked like a good opportunity but it failed, and it was unprofitable.” The most damaging factor, Carwell said, was the dramatic drop in prices. In the course of two years, he remembered, “crude went from \$6,000 a liter to \$200 a liter.” Carwell said his wholesale

business is still surviving, but he cannot justify hemp production for now, and certainly not the 35 acres he grew in 2021. Instead, Carwell is growing beans, corn, and rice for 2022.

Other hemp market participants also reported scaling down production for 2022. Mike Halsema is the co-owner of Halsema Hemp Farm in Indiana, which describes itself as a “seed to shelf” producer of organic CBD products. 2022 will be the farm’s third season growing hemp, but cultivation is being cut in half this year to around 1,000 plants, according to Halsema. “With the lack of ability to outright sell the flower I can’t move it as fast,” he told Hemp Benchmarks, “and I don’t have a buyer for my flower. I just have enough for now. And I don’t want to stop growing and stop promoting the business We still want to grow this year, we’re just at the minimum of what we can grow this year.”

While Halsema sells his hemp products nationally, he is also seeing a contraction of U.S. hemp cultivation for 2022. As for his colleagues in the hemp industry, “I think everybody’s worried about not being able to sell flower,” he said. “But everybody’s motivated.”

However motivated, the hemp industry in Indiana is facing its own challenges as it enters its third season. According to a report from the Office of Indiana State Chemist (OISC), quoted recently by local outlet [WANE](#), only 35% of the hemp grown in Indiana last year was sold, with 34% unsold, and another 31% of the state hemp crop destroyed - mostly due to higher-than-allowed THC levels. As for the unsold hemp, the OISC report noted that many licensed hemp growers “seem to have an aversion to both production and marketing contracts,” while 34% of the state’s hemp growers did not have a processor for their crop.

Early Reports from States Tell of Fewer Growers

Many states are still in the process of reviewing applications and

issuing hemp registrations, and thus do not yet have a complete picture of how much hemp production might occur this year. However, another pullback in hemp cultivation for 2022 has been acknowledged by at least some state agriculture departments.

In a mid-April email to Hemp Benchmarks Mike DiTomaso - Agricultural Resource Management Specialist for the Vermont Agency of Agriculture, Food & Markets' Hemp Program - noted his state has seen a "substantial decrease" in the number of hemp cultivation registrations for this year. "There were 248 registered growers by May 1 in 2021," he said, "and currently Vermont only has 53. Almost all of our grower registrants are growing for cannabinoids, 30 of which are registered to grow on less than 0.5 acres total." DiTomaso also noted that Vermont "continues to see the hemp industry trend toward a small scale vertically integrated, seed to shelf model with a focus on local high quality products."

Meanwhile, Robin Pruisner - State Entomologist, Hemp Administrator, and Ag Security Coordinator for the Iowa Department of Agriculture & Land Stewardship - also provided information "that show[s] how [hemp] licensing has slowed down" in her state. According to an email from Pruisner, as of April 12, 18 hemp farming licenses covering 84 acres had been issued in Iowa, compared to 50 licenses and 266 acres registered last year. This after the amount of hemp acreage planted in the state contracted by roughly two-thirds from 2020 to 2021, from 680 to 230 acres.

The Ongoing Pivot Toward Fiber and Grain

As we have mentioned over the past year, the static CBD market is prompting many in the hemp sector to look more closely at hemp fiber and grain.

In Montana, which has since legalization consistently been one of the larger hemp production states, the shift to grain and fiber

hemp occurred earlier than in much of the rest of the country. According to information provided previously to Hemp Benchmarks by the Montana Department of Agriculture (MDA), while 80% of the state's hemp acreage was intended for CBD in 2019, by 2020 about 90% of the hemp grown in the state was for grain and fiber. The emphasis on industrial, rather than cannabinoid, hemp in Montana persisted and increased in 2021, with MDA telling Hemp Benchmarks that 98% of the hemp harvested in the state last year, or roughly 2,000 acres, was for fiber and grain.

Farmers in some states with younger hemp programs are following suit. For example, according to an April 21 email from Derek Schiefelbein - Industrial Hemp Program Manager with the South Dakota Department of Agriculture and Natural Resources - the department "is on track to license 3,400 acres of industrial hemp so far for the 2022 growing season. 99% of those acres are grain and fiber varieties." Meanwhile, Holly Bell, Director of Cannabis at the Florida Department of Agriculture and Consumer Services, this month told Hemp Benchmarks that she is seeing fiber processing infrastructure put in place in her state.

While there is a rising interest in fiber and grain, at least one stakeholder says the development of the hemp grain and fiber industries in the U.S. is occurring much slower than it should be. "We don't have any government programs to support the evolution of bioplastics manufacture," Alexander Kulnevsky told Hemp Benchmarks. Kulnevsky is CEO of New Jersey-based Hempterra Technology, a firm that specializes in drying and decortication machinery for industrial hemp. "There are no incentives," he emphasized.

However, Kulnevsky said, awareness of hemp fiber and an accompanying rise in international demand are slowly but surely gaining momentum. "People realize that at this point, [for] textile, cellulose, bioplastic, building materials, anyone else taking fiber

from hemp in order to use in those industries, it was always a problem that there was not enough material to modernize their equipment in order to manufacture anything from fiber," he added.

Relocating from Ukraine & Reworking Soviet-Era Technologies

Kulnevsky said his company has established full decortication lines for hemp companies in the U.S., as well as working on future lines in Canada and the United Kingdom. The firm also manufactures its equipment at facilities in Ukraine and neighboring Moldova. "We have plants in Kharkiv and Odessa [in Ukraine]," he said. "The Odessa plant is still working and we have no problems there, but the Kharkiv plant, obviously, is not operational ..." he trailed off. Kulnevsky said his Ukrainian-based team of engineers, as well as some critical equipment, were relocated to Moldova just two weeks before Russia's invasion of Ukraine. "As soon as it's all over we can be relocated back to Ukraine in two weeks," he continued.

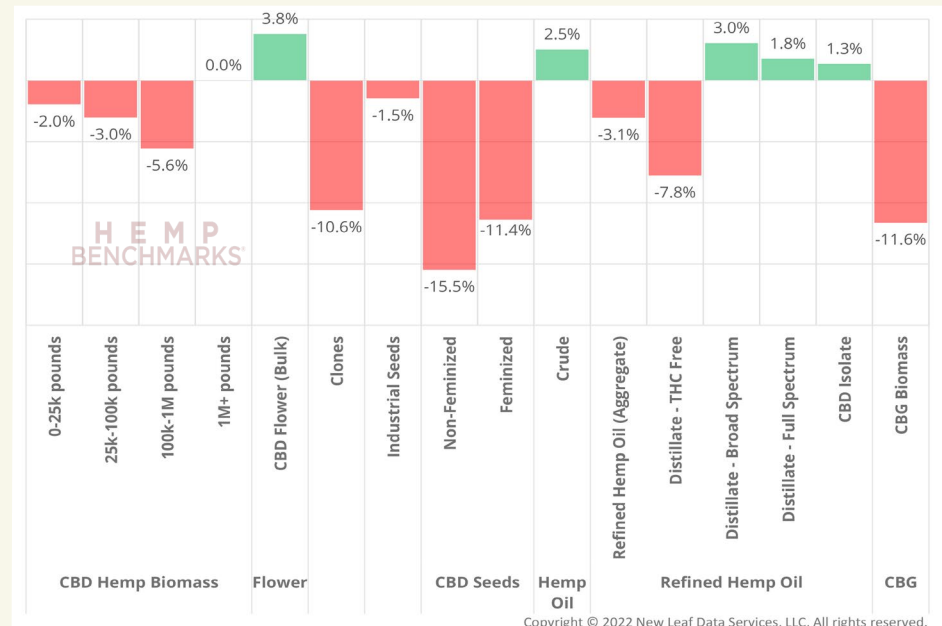
Kulnevsky said his company is also utilizing hemp processing technologies from the former Soviet Union and adapting them for modern applications. "We have on our team some people who worked in Soviet times," he continued. "We have blueprints and everything that is being adopted for today's standards. I don't know anyone developing things like this. There are some plants for decortication in Spain and elsewhere, but they require hundreds of tons of material. Our line can be installed anywhere where you have basic facilities and it takes three people to operate."

While his company does not deal directly with hemp cultivators, Kulnevsky said it is partnering with a multi-state hemp cooperative this season. For now, his firm's equipment can process one ton of input material per hour, per machine, with an average output of around 30% fiber content (the rest being hurd and smaller hemp fiber particles). But the company is currently developing machinery that can process four tons of hemp per hour, and is researching

machines with even larger capacity.

"It depends on [the kind of] hemp that farmers are using, and what region and what climate," Kulnevsky said. "In some regions you have to harvest, dry, and bale, and there are many different techniques for preparing hemp to be decorticated. Our equipment can handle all of it, but it can become more time-consuming with freshly-harvested, undried hemp."

Month-on-Month % Price Change



Hemp-Derived CBD & THC Sales Update

In recent years, Hemp Benchmarks has tracked the financial filings of several publicly traded hemp-cannabinoid product companies as a barometer of demand for CBD and, more recently, various forms of THC manufactured from hemp.

In our [previous update, which covered results for Q3 2021](#), we noted that CBD sales continued to hold largely steady, but at levels slightly depressed from those seen in the second half of 2020, at least for publicly traded companies. Meanwhile, filings from a company that deals in hemp-derived THC products showed impressive growth.

Trend of Stable CBD Sales Held to Close 2021

The hemp-CBD market continued to exhibit stability in the final quarter of last year, with the three primary companies under discussion - Charlotte's Web, cbdMD, and CV Sciences - reporting relatively small sequential shifts in gross revenue.

[Charlotte's Web \(CW\) reported \\$24.8 million in revenue in Q4 2021](#), up 4.6% from the prior period, but down 7.8% year-on-year, from \$26.9 million in gross sales in the same period of 2020. For 2021 as a whole, CW's sales reached \$96.1 million, up 1% from the prior year.

[cbdMD reported \\$9.86 million in gross sales for the final period of the 2021 calendar year](#), up slightly from \$9.8 million in Q3 2021, but down 25% year-on-year, from \$13.1 million in Q4 2020. 2021's annual sales of \$43.5 million were down 5.2% from 2020's full-year

tally of \$45.9 million.

[CV Sciences' Q4 2021 sales declined by 2.2% from the previous period](#), to \$5 million from \$5.1 million. The company's 2021 sales total of \$20 million was down 18% from \$24.4 million in 2020.

The announcements touting company financials frequently noted strong competition in the hemp-CBD space. CV Sciences called attention to "significant headwinds stemming from the ... competitive environment." Meanwhile, CW's press release did so obliquely, noting "increased unit sales volumes [were] largely offset by an industry-wide consumer shift to lower priced CBD products; primarily gummies and topical products."

Additionally, filings from the three companies under discussion repeated what has become a familiar refrain to explain the recent lack of growth in the hemp-CBD market: Namely, "regulatory uncertainty" regarding the compound due to the U.S. Food and Drug Administration's (FDA) continued declination to allow CBD to be marketed as a dietary supplement or added to foods. cbdMD's press release cited above goes so far as to state that, beginning in early 2021, "overall CBD consumer demand growth started to decline in the U.S." as a result of the "lack of regulatory clarity created by the [FDA]."

Hemp-Derived THC Sales Continue Apace Despite Uncertainty and Bans

While the hemp-CBD companies noted above have repeatedly cited a lack of regulatory clarity as an impediment to growth, such uncertainty does not appear to have slowed sales of various forms of THC manufactured from hemp. In fact, cbdMD's press release states that the FDA's lack of action on CBD has opened the door for hemp-THC products to the detriment of the former: "This is evident in the introductions of competitive products such as Delta 8, which is now banned for sale in over 30 states and created a negative

downward pressure on the CBD market.”

As we have covered since the second half of 2020, delta-8 THC and similar products themselves exist in a gray area in regard to their very legality. In the absence of action from the federal government, however, dozens of states have moved to ban such compounds or regulate them to various extents, with several new developments occurring this month.

In Michigan, the state Cannabis Regulatory Agency (formerly the Marijuana Regulatory Agency) on April 15 withdrew a request for rulemaking that would have established regulations to govern the manufacture of THC products from hemp.

In Georgia, the [Atlanta Journal-Constitution](#) reported that a judge “granted an injunction that prevents Gwinnett County District Attorney Patsy Austin-Gatson from enforcing a ban on products containing hemp-derived substances, including delta-8 THC, while litigation proceeds to determine whether they are legal.”

In Tennessee, proposed legislation that would have banned delta-8 THC and similar products was amended to instead regulate and tax them, according to the [Nashville Scene](#). The Scene report notes that the measure under consideration, HB 1927, now “limits the sale of Delta-8 to people 21 and older, establishes a 5 percent excise tax on products that contain Delta-8, and creates licensing and product testing requirements for retailers and manufacturers through the Tennessee Department of Agriculture.”

Despite shifting and idiosyncratic state-by-state regulatory approaches, our primary window into sales trends for hemp-derived THC products - the financial filings of LFTD Partners Inc. - indicates that the sector continued to experience strong growth to close 2021. According to a [company deck published earlier this month](#), LFTD’s Q4 2021 revenue reached \$12.8 million, up 45% from the previous quarter. Q4 2021’s gross revenue increased by

nearly six times year-on-year, from \$2.2 million in Q4 2020. Overall for 2021, the company’s consolidated sales of over \$31.6 million also expanded by roughly a factor of six relative to the prior year.

LFTD’s deck also reveals an interesting shift in its business. While delta-8 has become the go-to signifier for hemp-THC products overall, the company’s deck states that, based on Q1 2022 sales, the principle ingredient in products making up 47% of LFTD’s revenue is THCO, with delta-8, delta-9, and delta-10 THC products combining to account for 35% of sales. The company’s reporting also shows that vapes and cartridges are the preferred products for consumers, making up almost two-thirds of sales in Q1 2022, followed by edibles at just over a quarter of sales in the period.

Finally, it is apparent that state-level efforts to regulate or ban hemp-THC products are not impeding their distribution and sales. LFTD’s deck touts an online customer base of 17,000, direct sales to over 1,000 retailers in the U.S., and “hundreds of distributors” reaching “thousands” of additional stores.

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.

Latin American Hemp Market Update: Ecuador

Ecuador is one of several Latin American nations that are laying the groundwork for their local hemp industry to become a regional power on the international stage. While hemp production is still nascent in Ecuador, a [2021 report](#) by the cannabis analytics firm New Frontier Data noted that the country has “learned from its neighbors and moved quickly,” establishing detailed hemp importation, cultivation, and research guidelines in 2020, just months after the nation legalized the production, marketing, and export of hemp.

The Ecuadoran Agriculture Ministry has also [decriminalized](#) the overall production of cannabis with less than 1% THC content for medicinal and therapeutic purposes, as well as issuing scores of ten-year hemp licenses and allowing the importation of hemp seeds, in order to make its hemp sector competitive in the global market. (Although Ecuador recently [allowed the regulation and production of medical THC cannabis](#), it has yet to establish a recreational THC market.)

“Ecuador will be a great actor in the non-psychoactive cannabis and hemp market,” Alfredo López told Hemp Benchmarks. López is the Latin American Industrial Hemp Association’s (LAIHA) ambassador in Ecuador. He is also the founder and COO of CannAndes, which was formally established in 2020 and which has quickly grown into one of Ecuador’s leading industrial hemp companies.

Adapting Local Agribusiness for Hemp

Ecuador’s agricultural sector already has an established international reputation. The country is the [world’s largest producer and exporter of bananas](#), and it is also known for its seafood, cut flowers, and fruit production. According to López, integrating industrial hemp into the nation’s agricultural sector is very feasible. “The geographical, climate, and sunlight advantages that we have in Ecuador are unique,” he said. “We have large extensions of sugar cane, African palm, and flowers, which can be easily changed to industrial hemp.”

The challenges hemp faces in Ecuador, López noted, are mostly genetic: namely, finding varieties that can adapt quickly to the local climate. “We also have to see what the end of the business would be,” he continued, “if it is [for] seed production, hemp is more viable; same for short fiber. I don’t know if we can make textile fiber in the short term, [but] everything else is very viable.”

Hemp is also seen as a potential commodity that can help to diversify Ecuador’s agribusiness, an important consideration in a volatile global market. The nation’s total flower exports reportedly fell by 8% in 2020, due in part to the COVID-19 pandemic. Analysts, however, believe hemp could help offset any further declines in that sector. López noted that while Ecuador’s flower industry remains important, “the advantage that growers of roses and flowers have is that they have ... the infrastructure in place to start in the non-psychoactive cannabis industry, just by changing crops.”

Becoming an International Laboratory for Hemp Development

No hemp products or derivatives have been commercially exported from Ecuador, although there are efforts to change that situation.

López said CannAndes has sent sample hemp products, specifically flower and cannabinoid extracts, to potential customers in Switzerland for analysis. He is also optimistic that the nation's agricultural experience, along with its exportation infrastructure, makes Ecuador well-positioned to become a laboratory for the development of hemp and hemp products internationally.

FEDERAL UPDATES

FDA Warnings

In late March, the U.S. Food and Drug Administration (FDA) issued warning letters jointly with the Federal Trade Commission to seven companies for “selling CBD products using research studies to claim or imply misleadingly that their CBD products will cure, mitigate, treat, or prevent COVID-19.” The [FDA's website](#) notes the agency has not approved or authorized any CBD-containing drug for the treatment or prevention of COVID-19, and expressed concerns that “these deceptive and misleading product claims could cause people to delay or stop appropriate medical treatment for COVID-19, leading to serious and life-threatening harm.”

[According to the Vicente Sederberg](#) law firm, the warnings marked the “first robust enforcement action” by the FDA this year. It also noted that, as in previous letters, the warnings target claims made by CBD product companies that highlight products are intended to “mitigate, prevent, treat, diagnose, or cure” a disease or health condition.

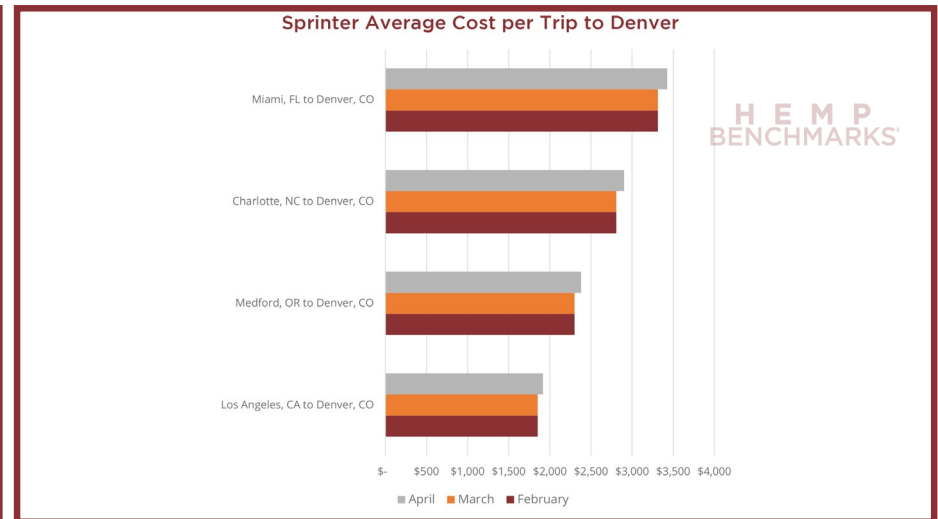
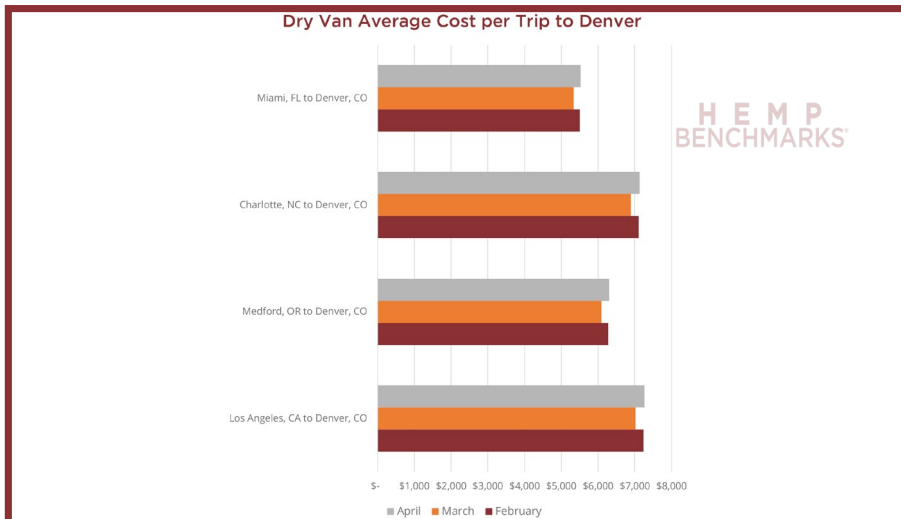
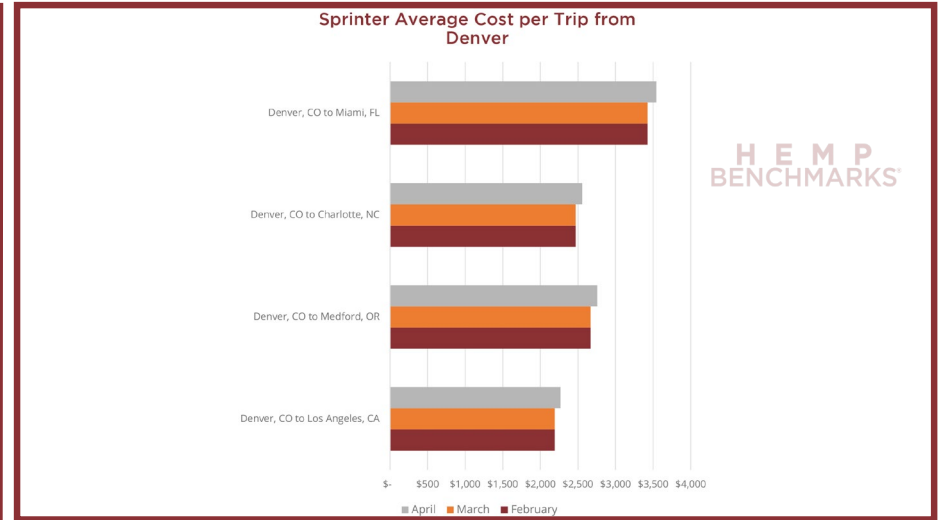
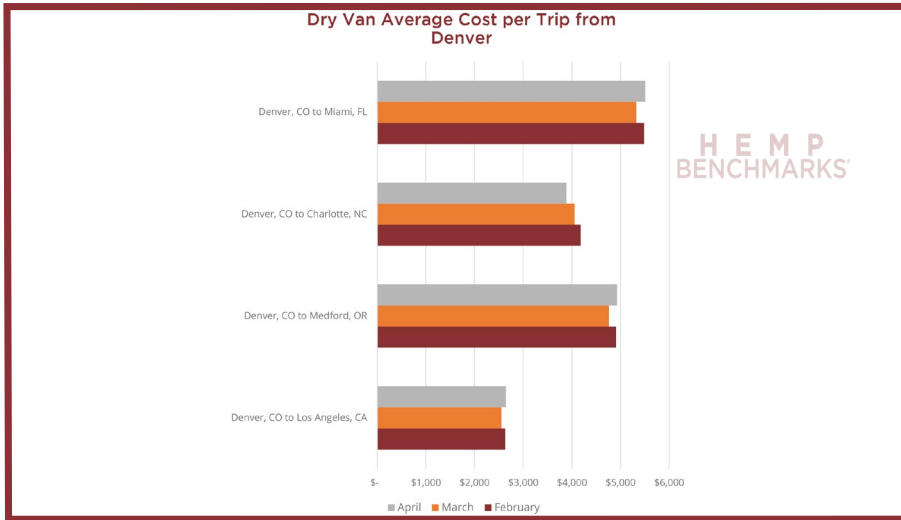
The graphic features a central dark red banner with the text "HEMP BENCHMARKS™ HEMP MARKET INSIDER WEEKLY HEMP INDUSTRY UPDATES" and the website "WWW.HEMPBENCHMARKS.COM™". It is surrounded by four circular icons: a beaker with a flame, a molecular structure, a growing plant, and a DNA double helix.

Sign up for our complementary Hemp Market Insider for weekly updates on topics such as:

- **Updates on delta-8 THC regulations**
- **Specific regional updates**
- **Supply chain enhancements**

The logo for Cannabis Benchmarks features the text "North American Marijuana Benchmarks" above a stylized "C" icon, followed by "CANNABIS BENCHMARKS®" and the website "www.cannabisbenchmarks.com".

TRANSPORTATION UPDATE



*Data from FIDE FREIGHT April 2022

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TRANSPORTATION UPDATE



*Data from FIDE FREIGHT April 2022

INDUSTRY UPDATES

Cone Demin

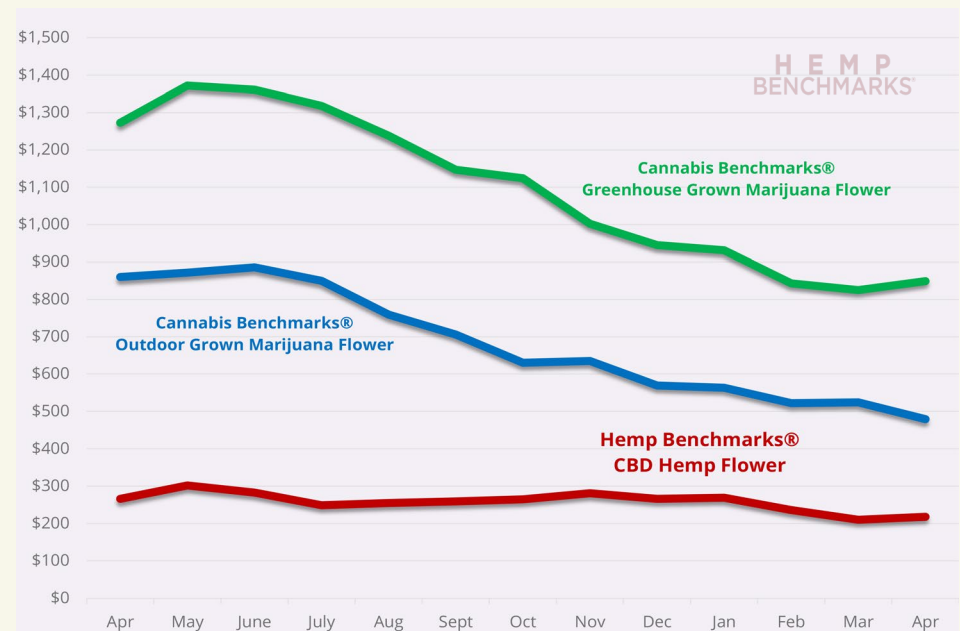
On April 12, North Carolina denim maker Cone Demin announced it was launching a U.S.-grown hemp clothing collection, in collaboration with BastCore, a hemp fiber processing company. According to a [press release](#) the apparel uses a patent-pending technology and a proprietary process from BastCore that produces “clean, mechanically processed, OEKO-TEX® STANDARD 100 certified and USDA bio-preferred hemp fiber.”

HempWood

As we mentioned in a recent [Hemp Market Insider article](#), current global supply chain disruptions - as well as dramatic hikes in lumber prices - appear to have benefitted a currently niche part of the hemp sector: the fledgling hemp “lumber” business.

Greg Wilson, owner of Kentucky-based HempWood, told Hemp Benchmarks there is a growing market for his composite flooring. That product is made up of more than 80% hemp fiber that uses the entire hemp stalk, and then binds the ground-up hemp with soy protein. According to Wilson, HempWood is being sold by around 30 retailers across the U.S. In terms of price, Wilson said standard HempWood products are competitive with American White Oak flooring, one of the most popular flooring products in the country.

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



Note: Current month Cannabis Benchmarks prices are MTD at time of publishing. Copyright © 2022 New Leaf Data Services, LLC, All rights reserved.

RESEARCH UPDATES

CBD A May Lower Stress Levels in Cattle

As we mentioned last month, the National Industrial Hemp Council of America sent separate letters to the Association of American Feed Control Officials and to the FDA's Center for Veterinary Medicine in mid-March. The letters said that sufficient research currently exists to include hemp as a safe ingredient in the U.S.'s animal feed supply chain. It also proposed a webinar with regulators to discuss removing barriers for using hemp as animal feed.

At the end of March, meanwhile, a study by researchers at Kansas State University suggested that feeding certain kinds of hemp to cattle might reduce stress in the animals. "Cattle experience a variety of stress and inflammation," said Michael Kleinhenz, assistant professor of beef production medicine at the K-State College of Veterinary Medicine, said in a [press release](#). "Our most recent data shows how cannabinoids via industrial hemp decreased the stress hormone cortisol as well as the inflammatory biomarker prostaglandin E2. This shows that hemp containing cannabidiolic acid, or CBD A, may decrease stress and inflammation in cattle." Kleinhenz noted that hemp could become a natural way to assist in livestock health during transportation, weaning, and other production practices.

Hemp and Phytoremediation

A group of students and faculty advisors at the University of Wisconsin-Stevens Point are collaborating as part of a project to investigate hemp's beneficial environmental effects. "Our research

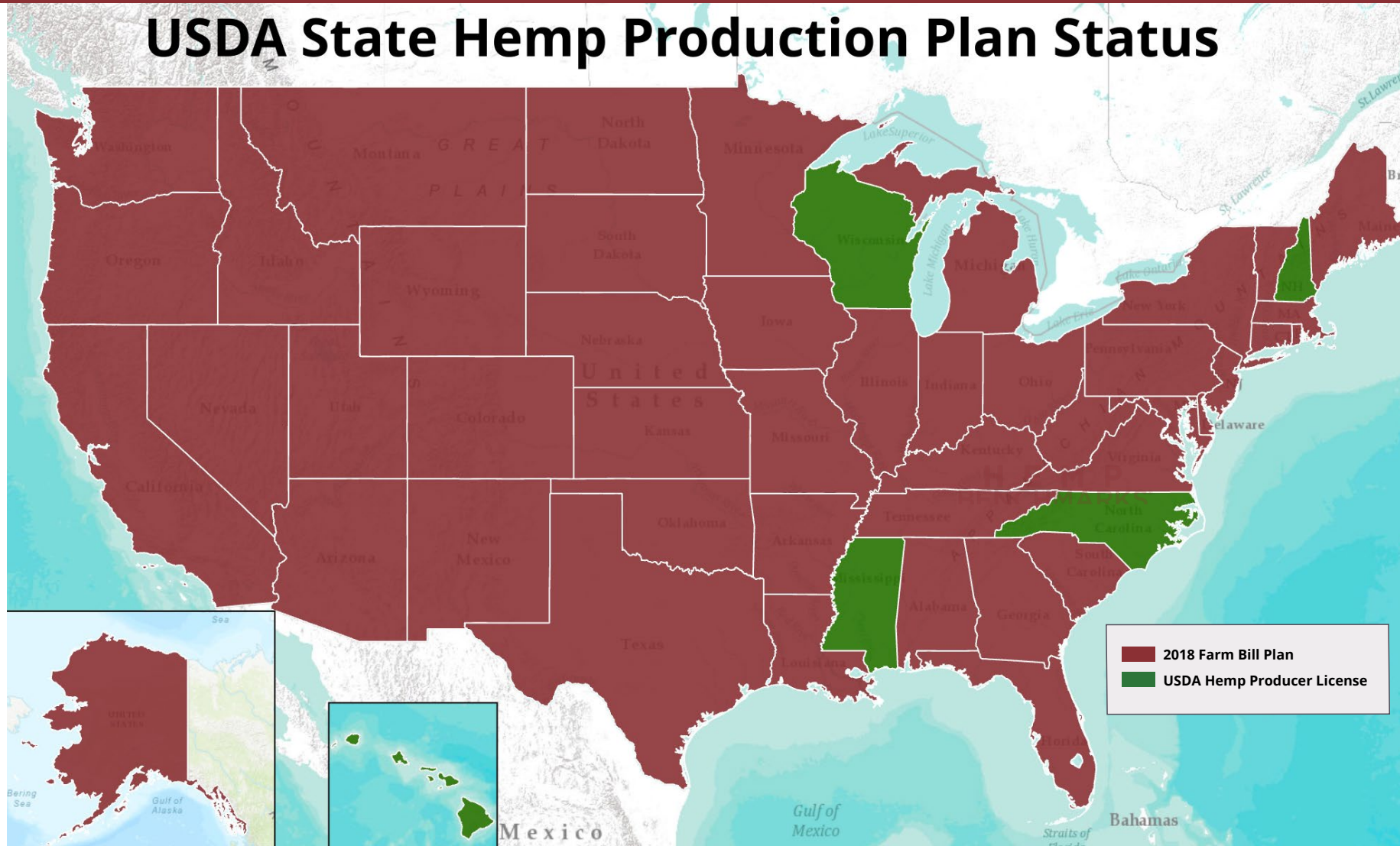
is focused on using hemp for phytoremediation - the removal of toxins from soil," Brian Barringer, an associate professor of biology and a co-adviser on the project, said in a [university press statement](#). "The hemp plants take up the pollutants, allowing it to grow in soils that contain heavy metals such as lead or arsenic. This would diversify agriculture in Wisconsin and allow farmers to clean up the environment while making a profit."

The study, which began last autumn, had the students and faculty grow seedlings intended for CBD production and then transfer the plants into soils treated with different concentrations of lead, arsenic, and fertilizer to see how those conditions affected the plants.



STATE UPDATES

USDA State Hemp Production Plan Status



2021 State Hemp Licensing and Acreage Data

STATE	# of Licenses	Permitted Outdoor Acres	Permitted Greenhouse Sq Ft	STATE	# of Licenses	Permitted Outdoor Acres	Permitted Greenhouse Sq Ft	STATE	# of Licenses	Permitted Outdoor Acres	Permitted Greenhouse Sq Ft
Alabama	173	1,512	734,951	Louisiana				Ohio	179	1,498	531,697
Alaska				Maine				Oklahoma	57	3,322	38,762
Arizona	88		11,558	Maryland				Oregon	815	7,468	8,066,281
Arkansas	49	586	114,424	Massachusetts	65	407	95,041	Pennsylvania	426		
California		17,321	13,386	Michigan	158	2,830	1,301,779	Rhode Island			
Colorado	485	18,592	5,369,000	Minnesota	342	5,241	2,950,000	South Carolina	216	3,000	1,500,00
Connecticut	978	183	470,600	Mississippi				South Dakota	18	2,200	
Delaware	14	23	59,320	Missouri				Tennessee	1,029	5,699	6,307,488
Florida	744	18,220		Montana	38	5,400		Texas	760	3,405	10,871,664
Georgia	152	875	1,247,159	Nebraska	62	886	266,613	Utah	126	271	437,308
Hawaii				Nevada	61	2,843	496,542	Vermont	328	725	
Idaho				New Hampshire				Virginia	862	7,860	
Illinois	647	22,962	103,847,040	New Jersey	49	270	1,960,200	Washington			
Indiana	125	2,215	271,548	New Mexico	128	468	10,060,884	West Virginia			
Iowa	50	268		New York	743	32,711	11,477,099	Wisconsin	649	5,333	
Kansas	81	1630		North Carolina	780	6,500	4,000,000	Wyoming			
Kentucky	450	11,500		North Dakota	45			TOTAL	11,104	194,290	171,000,344

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2020 State Hemp Licensing and Acreage Data

STATE	# of Licenses	Permitted Outdoor Acres	Permitted Greenhouse Sq Ft	STATE	# of Licenses	Permitted Outdoor Acres	Permitted Greenhouse Sq Ft	STATE	# of Licenses	Permitted Outdoor Acres	Permitted Greenhouse Sq Ft
Alabama	422	15,160	1,209,988	Louisiana	162	2,600		Ohio	195	2,067	565,788
Alaska		70	9,000	Maine	111	363		Oklahoma	127	3,891	244,934
Arizona	165	34,000		Maryland	95	1,400		Oregon	1,635	25,273	1,100,188
Arkansas	210	2,294	369,972	Massachusetts	99	505	215,352	Pennsylvania	506	3,200	1,579,000
California	476	42,287	12,069	Michigan	952	14,338	11,736,475	Rhode Island	20		
Colorado	1,254	36,225	11,400,000	Minnesota	444	8,544	4,640,000	South Carolina	267	5,352	
Connecticut	170	500	117,899	Mississippi				South Dakota			
Delaware	13	75	34,000	Missouri	207	3,561		Tennessee	1,012	15,721	13,285,800
Florida	611	22,078		Montana	94	12,675	240,000	Texas	681	5,000	
Georgia	132	1,446	1,259	Nebraska	91	1,675	465,807	Utah	187	687	312,042
Hawaii	45	440		Nevada	116	3,875	789,623	Vermont	557*	1,532	9,045
Idaho				New Hampshire				Virginia	1,272	9,113	9,405,000
Illinois	802	25,069		New Jersey	59	449	2,526,480	Washington		3,738	
Indiana	283	8,951	1,760,000	New Mexico	276	2,037	3,845,160	West Virginia	303	3,917	
Iowa	86	733	2,106,067	New York	546	31,059	9,862,857	Wisconsin		3,484	957,757
Kansas	207	9,925		North Carolina	1,503	16,421	7,459,060	Wyoming	28	1,058	18,150
Kentucky	960	30,000	4,600,000	North Dakota	79			TOTAL	19,799	429,300	90,878,772

*557 is combination of grower and processor licenses

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STATE UPDATES

Michigan

On April 15, the state's Cannabis Regulatory Agency (CRA) announced it would not allow hemp to be synthetically converted into THC. "After receiving a significant amount of public comment regarding safety concerns and the lack of scientific and public health data related to the conversion process outlined in the proposed industrial hemp rules ... [CRA] has withdrawn this request for rulemaking," [MLive.com](#) quoted the agency as saying. The CRA had [reportedly](#) conducted hearings this past February on a proposal that would have allowed hemp growers to sell plants to cannabis processors, who would then convert CBD and other cannabinoids into THC.

Robin Schneider, Executive Director of the Michigan Cannabis Industry Association, [told the cannabis industry website Grown In](#) that many in her organization were opposed to the idea on safety grounds, particularly regarding the unknown effect that synthetic products might have on consumers. "The deciding factor was definitely the lack of any concrete scientific information," Schneider said. "I didn't see a ton of support from the hemp community on this."

New York

In mid-April, the state's Cannabis Control Board [approved](#) 52 adult use Cannabis Conditional Cultivator Licenses for registered hemp farmers across the state, in an effort to fast-track the establishment of what is expected to become [one of the nation's largest legal marijuana markets](#). These are the first adult use cannabis licenses granted in New York state, and were approved under a recently-passed law that allows hemp cultivators to grow marijuana for New

York's legal recreational market for the next two years.

It remains to be seen whether hemp growers taking advantage of the opportunity to grow high-THC forms of marijuana for the adult use market will impact how much hemp is grown in New York this year. Hemp Benchmarks is aware of at least some registered New York hemp farmers who received adult use cannabis licenses who will be focusing on growing for the legal marijuana market this year rather than planting hemp.

North Carolina

The state's current hemp laws are set to expire on June 30, leading some stakeholders to wonder if their hemp-derived CBD products will soon be considered illegal. "Essentially, on June 30, hemp goes back to being defined as marijuana," Erik Stahl, owner of the Modern Apotheca hemp products store in Raleigh, recently told [WNCN-TV](#).

Stahl noted the state's current exemption removes the term hemp from the definition of marijuana under North Carolina's controlled substance act. The state also previously licensed hemp farmers, allowing it to control and test the kind of hemp they grew. Back in January, however, the state's hemp farming laws expired, turning over grower licensing, THC testing, and other oversight responsibilities from the North Carolina Department of Agriculture & Consumer Services to the U.S. Department of Agriculture.

Ohio

State regulators are changing Ohio's definition of THC to include more cannabinoids, including those synthesized from hemp-derived CBD. [The new rule](#), according to the Ohio Department of Commerce's Medical Marijuana Control Program, goes into effect on May 2. It defines THC in medical marijuana products as including, but not limited to, delta-1, delta-3, delta-4, delta-6, delta-8, and delta-10 - as well as delta-9. "Marijuana markets have

seen the emergence of novel cannabinoids, particularly Delta-8 THC and other THC isomers / analogs ... that are either naturally occurring or can be artificially derived from CBD,” Jennifer Jarrell, a spokeswoman for the Ohio Department of Commerce, told Cleveland.com.

Oregon

After last season’s historic drought conditions significantly impacted the state’s hemp crop, there are signs that Oregon’s largest river basin will be facing another extremely dry year in 2022. According to a recent report from the U.S. Army Corps of Engineers (Corps), as covered in local outlet KPIC, water managers in the Willamette Valley are bracing for another challenging year. The Corps reported the 13 Willamette Valley reservoirs were 53% full as of April 21, or about 33% below normal.

“Extended drought conditions, variability of snowpack in the Cascades, and modified dam operations to support downstream passage of juvenile salmon are impacting refill of the system,” Erik Petersen, Willamette Valley Project operations project manager, said in a press statement. “This will be a tough water year with less overall system storage, limiting our supplies to augment for water quality and fisheries habitat downstream during the summer and fall.”

INTERNATIONAL UPDATES

Canada

The Alberta government, in partnership with the Canadian federal government, has awarded two grants meant to help the province’s

hemp industry. C\$900,000 was reportedly awarded through the Partnership, a five-year, \$3 billion commitment by the federal, provincial, and territorial governments to support Canada’s agriculture, agri-food, and agri-products sectors. Global News reported that the hemp manufacturing firm INCA Renewtech will receive up to C\$400,000 to help build a new C\$72-million hemp processing facility in Alberta. The province said the facility will create demand for 54,000 tons of hemp biomass per year, adding C\$270 million in additional farm income over 25 years.

Costa Rica

A group of Costa Rican and Paraguayan entrepreneurs have reportedly invested more than \$300,000 to capitalize on the legalization of hemp and medical cannabis in Costa Rica. The Tico Times reports that more than 120 new CBD products, many imported from Paraguay, will be introduced in national stores as part of the initiative.

Poland

In late March, Polish President Andrzej Duda signed into law a measure that establishes rules for the cultivation and harvesting of medicinal cannabis. It also raises the maximum THC level in hemp from 0.2% to 0.3%. According to a blog post on the website of DLA Piper, a global law firm, the Act will allow the cultivation of non-fibrous hemp and the harvest of the herb or resin of non-fibrous hemp intended for the manufacture of pharmaceutical raw material; however, only for research institutes supervised by the Minister of Agriculture.

United Kingdom

The UK has reportedly become the first country in the world to regulate the public sale of orally-administered legal cannabinoids, following the publication in early April of a list of permitted products. According to AgFunderNews.com, the nation’s Food Standards Agency, in collaboration with the Association for the

Cannabinoid Industry (ACI), a UK-based trade group, compiled the list of around 3,500 products containing CBD that have been given a green light to remain on shelves (both physical and online) in England and Wales.

Speaking at the CBD list launch event, ACI founder Steve Moore said implementation of the regulatory framework will “de-risk” CBD for producers, retailers, consumers, and investors.

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.