

HEMP REPORT: TOP 10 U.S. STATES



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Welcome to the Hemp Report: Top 10 U.S. States, produced by the research team at Hemp Industry Daily

Hemp was once prized for making rope. Two hundred years later, the plant still has us tied in knots. From a patchwork of state hemp rules about who can grow the crop and how it can be used to ongoing legal and medical confusion about hemp extracts, uncertainty reigns in the hemp industry.

But the private sector isn't waiting for regulators and medical researchers to untangle hemp's potential. The hemp industry is exploding, with a dizzying variety of CBD-infused products and hemp derivatives showing up everywhere from roadside farmer's markets to expensive boutiques to veterinarian offices.

Cannabis research firm Brightfield Group estimates that the U.S. market for hemp-derived CBD hit \$291 million in 2017 and will balloon to \$1.65 billion by 2021 – growth of more than 500% in just four years.

Hemp's remarkable growth is drawing the attention of a diverse group of investors, entrepreneurs and policymakers. Many new entrants to the hemp industry have no familiarity with cannabis; others are longtime marijuana operators looking for new opportunities.

All are facing dramatic headwinds as hemp processing struggles to keep up with investor and consumer enthusiasm for the plant.

In this report, you'll find detailed analysis of the nation's top 10 hemp-growing states, along with charts showing exclusive market intelligence about a crop that is not tracked by any national regulatory agency.

THIS REPORT DETAILS:

- Where hemp is being grown, how farmers are growing it and what they're getting paid for it
- Business opportunities in hemp production and processing
- Differences in U.S. hemp markets and regulations
- Climate and pest challenges and how they vary by state and region
- Exclusive intelligence about future opportunities in hemp

Most of the data in this report comes from state agriculture regulators and hemp growers themselves. Because hemp is legal only under the auspices of state-approved pilot programs, the U.S. Department of Agriculture doesn't track hemp prices nor offer research assistance to the hemp industry.

If you have any suggestions or want to provide feedback, please contact me at: kristenn@hempindustrydaily.com

Best regards,

Kristen Nichols
Hemp & CBD Industry Reporter



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The states included in this report are presented in order from largest to smallest, based on number of acres licensed in 2017. While Kentucky had more actual acres licensed than Colorado in 2017, we rank Colorado as No. 1 due to other market considerations.

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COLORADO



No hemp discussion goes far in the United States without a mention of Colorado, where more than half the nation's 2017 hemp production occurred.

While Kentucky technically licensed more acres in 2017, Colorado has more acres in production, more farmers growing the crop, more processors extracting CBD from hemp and more market opportunities for selling the plant than any other state.

Colorado allowed hemp production long before Congress authorized a revived industry with the 2014 Farm Bill. Colorado farmers began putting hemp seeds in the ground months after voters legalized recreational marijuana in 2012.

But success comes at a price. And in Colorado right now, that price is falling prices for growers, as well as ongoing headaches finding places to sell all the hemp Colorado is cultivating.

INDUSTRY SNAPSHOT

Colorado voters authorized hemp production in 2012, and the plant was growing in experimental plots by spring of 2013 – before state agriculture regulators had written the rules for the industry.

The industry has been on a steady upward trajectory ever since, with unparalleled seed supply, marketing opportunities and processing infrastructure.

Colorado has no application deadline for interested hemp producers, no acreage limit and no requirements for processing licensure.

Unlike most hemp states, Colorado ignored federal directives to seek approval from the U.S. Drug Enforcement Administration before importing viable hemp seed taking a “don’t ask, don’t tell.” approach to hemp-seed acquisition. Producers were not asked to show where they acquired cannabis genetics.

Colorado now has seven varieties of certified hemp seeds.

COLORADO HEMP SNAPSHOT

Licensed Growers: **386**

Licensed cultivation space:

12,042 outdoor acres

2.35 million square feet indoors

Products allowed:

Flower
Seed or Seed Oil
Fiber

As of December 2017

MARKET CONSIDERATIONS

Colorado's hemp-commodity prices are not tracked by any standard exchange. But heavy competition in the state's hemp market appears to have depressed prices for producers.

Flower varieties dominate Colorado hemp production.

But Colorado farmers see the same hemp-processing logjams that hamper colleagues in other states. CBD extractors are too few, and fiber processors are almost nonexistent. As a result, some producers are moving into the extraction business for themselves.

From university hemp research to hemp-centered biotech firms to farm-equipment manufacturing, Colorado has more businesses in the hemp space than any other state. Colorado hemp entrepreneurs say that dominance in hemp research will keep Colorado the industry leader, despite having a climate that's far from ideal for outdoor agriculture. Colorado is expected to maintain its position as a hemp industry leader.

WHOLESALE PRICE BY PRODUCT



*Average price per pound

SOURCE: Hemp Industry Daily
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KENTUCKY



Kentucky checks all the boxes for nourishing a hemp revival. A climate well-suited for the plant, friendly regulations from a state willing to experiment and invest in hemp, and a processing infrastructure that includes in-state decortication and CBD extractors.

Kentucky agronomists speculate that the state's hemp production has met demand, though strong hemp interest from former tobacco farmers could make Kentucky the epicenter of a shift in the sector away from Western states and to former top tobacco-producing regions.

But Kentucky's approved total acreage for hemp in 2018 is down slightly from 2017, from 12,800 acres to 12,018 acres.

And though Kentucky authorized 12,800 acres for hemp last year, only about 3,200 acres were planted.

INDUSTRY SNAPSHOT

Kentucky saw hemp's promise as a potential replacement for tobacco, once grown in abundance across the Bluegrass State.

Kentucky authorized hemp production in 2013, a year before the federal government did, and is thought to be the only state using Tobacco Master Settlement Agreement funds to support a hemp industry.

Kentucky has collected more than \$2 billion from the tobacco settlement since it was struck in 1998. Half the money goes to the Governor's Office of Agricultural Policy, which promotes crops including hemp. Kentucky's two Republican U.S. senators, Rand Paul and Mitch McConnell, were instrumental in opening the door for the modern-day U.S. hemp industry, steering the plant into the 2014 Farm Bill.

KENTUCKY HEMP SNAPSHOT

Licensed Growers: **209**

Licensed Processors: **43**

Licensed cultivation space:
12,800 outdoor acres

Products allowed:
Flower
Seed or Seed Oil
Fiber

As of December 2017

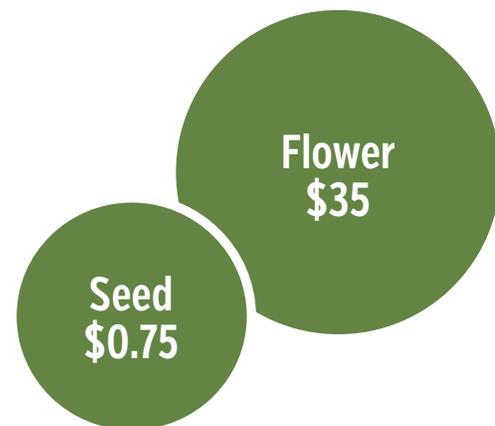
MARKET CONSIDERATIONS

Though no formal commodity pricing exists in the hemp market, Kentucky growers surveyed by Marijuana Business Daily report that growers are getting:

- About \$20-\$50 per pound of dried flower, depending on CBD content and quality.
- About 70-85 cents per pound of seed for pressing into oil.
- There is no reliable price for fiber, because the market is so small.

Kentucky's future as a hemp market leader likely depends on the state's ability to build demand for the new crop by bolstering processing.

WHOLESALE PRICE BY PRODUCT



*Average price per pound

SOURCE: Hemp Industry Daily
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OREGON



Oregon has a well-established network of hemp growers and processors, plus a sweeping new testing regime that helps boost its position in the hemp industry.

Its 2017 testing law requires hemp producers to give their products the same testing as marijuana, meaning Oregon hemp products will be food-grade quality and tested for pesticides and contaminants.

This could position Oregon hemp products for national dominance, an attractive proposition for growers in this Pacific Northwest state.

INDUSTRY SNAPSHOT

Oregon authorized hemp cultivation in 2009. But the state's Department of Agriculture didn't license the first hemp grower until 2015, after Congress expressly authorized states to allow hemp.

The state requires separate licenses for growing and processing hemp, though some businesses hold both. Each license costs \$1,300 a year.

Oregon also issues a license for producing viable hemp seed. Those permits cost \$120 a year and must be held in conjunction with a growing or processing license.

The state has no background-check requirements for hemp growers or processors. But hemp producers are subject to the nation's most exhaustive testing requirements, with 100% of registered hemp fields tested for THC content.

Even though Oregon allows seed and fiber production, nearly all the hemp growers are raising plants for CBD extraction. The state has a limited number of hemp growers pursuing seed production, and no known processors for fiber.

OREGON HEMP SNAPSHOT

| | |
|-----------------------------|---|
| Licensed Growers: | 233 |
| Licensed Processors: | 170 |
| Licensed Seed Producers: | 119 |
| Licensed cultivation space: | 3,500 outdoor acres |
| Products allowed: | CBD Extraction Seed or Seed Oil Fiber |

As of December 2017

MARKET CONSIDERATIONS

There is no official tracking of hemp commodity prices by any standard exchange. Oregon hemp growers report that the market is fetching:

- \$100 or more per pound of dried flowers or buds for use in CBD extraction. As in other states, prices vary widely based on CBD content. One large processor pays \$10 per pound per CBD percentage, meaning that flower product at 13% CBD would fetch \$130.
- Less than 50 cents per pound for seeds to be eaten as food products or pressed for seed oil.
- There is no reliable price per pound for stalks to be turned into fiber, because the market is so limited. In 2016, the state studied the prospect of using hemp stalks and other hemp products in animal feed, but the Department of Agriculture decided it was too risky, making that use off-limits for Oregon hemp producers.

Hemp-derived CBD products sold in Oregon will have to carry labels guaranteeing their CBD content, similar to how marijuana products carry THC-content labels.

Oregon's new testing requirements took effect in October 2017, and the state has not estimated how the changes could affect prices. A fiscal analysis prepared for state lawmakers projected the change would cost the Oregon Department of Agriculture about \$50,000, which "may result in an increase in fees" that could be passed onto consumers.

WHOLESALE PRICE BY PRODUCT



*Average price per pound

SOURCE: Hemp Industry Daily
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NORTH DAKOTA



With more than 3,000 acres in active production and an unparalleled system for getting viable, certified seeds to interested growers, North Dakota could one day be the leader in hemp – just as it is for other agricultural commodities from corn to flaxseed.

But North Dakota has natural enemies that limit hemp's ability to thrive, as well as manmade issues that curb the plant's potential uses.

The state's 2017 drought plagued hemp growers in western North Dakota; four farmers lost hundreds of acres each. The water woes could reduce interest in a crop for which production and seed costs are much higher than other row crops, according to state agriculture officials.

INDUSTRY SNAPSHOT

North Dakota legalized hemp production in 1999, though state authorities deferred to federal prohibitions on growing hemp. In 2016, North Dakota licensed its first five private hemp growers.

The number of North Dakota hemp growers jumped to 35 in 2017. Unlike other hemp regulators, North Dakota's Department of Agriculture has helped interested growers acquire certified seed from neighboring Canada.

The state limits hemp production to seed and fiber, meaning the plant can't be grown for high-value CBD oil. And state officials say they're not seeking changes to how hemp can be sold.

In addition, North Dakota has a dearth of processors: A single processor presses the seeds into oil for food products. By contrast, the state doesn't have any processors handling hemp fiber, the plant's largest product by volume.

NORTH DAKOTA HEMP SNAPSHOT

| | |
|-----------------------------|---------------------------|
| Licensed Growers: | 35 |
| Licensed Processors: | 1 |
| Licensed cultivation space: | 3,100 outdoor acres |
| Products allowed: | Seed or Seed Oil Fiber |

As of December 2017

MARKET CONSIDERATIONS

North Dakota hemp growers surveyed by Marijuana Business Daily report that the market is fetching:

- › 50 cents per pound for seeds to be eaten as food products or pressed for seed oil.
- › There is no reliable price per pound for stalks to be turned into fiber, because no processors exist.
- › There is no reliable price per pound for flowers, because CBD extraction is illegal.

The market limitations are leading North Dakota's few hemp growers to store most of what they're growing and hope for change. Seeds, however, can be stored for only a limited time before going rancid.

North Dakota's hemp growers also face high per-acre licensing fees – \$150 per year plus \$25 per acre to pay for state THC testing.

High seed prices, relative to other crops, along with weather uncertainty and limited options for pest management, could keep many North Dakota farmers from experimenting with hemp. Until state regulators or lawmakers change how hemp can be sold, North Dakota's market for the plant is unlikely to grow past a niche crop for food-grade seed products – a worthwhile endeavor for some growers.

WHOLESALE PRICE BY PRODUCT



*Average price per pound

SOURCE: Hemp Industry Daily
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MINNESOTA



Minnesota has an abundance of wild hemp descended from World War II-era crops, and the state's northern latitude makes it a natural fit for hemp varieties already growing in Canada. The state has allowed modern hemp production since 2016 and has flexible rules on how the crop can be used.

But no Minnesota hemp grower has reported a profit yet.

Hemp growers in Minnesota report processing delays and legal confusion, plus natural pests that make hemp production difficult for novice farmers.

But Minnesota's small hemp industry has plentiful enthusiasm, with farmers optimistic about the prospects for growing a profitable industry.

INDUSTRY SNAPSHOT

Though hemp grows wild throughout much of Minnesota, federal authorities wouldn't allow the state to develop the wild hemp, instead requiring it to import hemp seeds from Canada or other nations.

Still, Minnesota's hemp industry has grown dramatically in two years. Minnesota had just six farmers growing about 40 acres in 2016; as of 2017, the state had 38 licensed growers on 1,205 acres.

While producers have expressed interest in developing hemp for a variety of purposes, a lack of processors in the state has been a critical barrier for profitability.

MINNESOTA HEMP SNAPSHOT

| | |
|-----------------------------|--|
| Licensed Growers: | 38 |
| Licensed Processors: | 0** |
| Licensed cultivation space: | 2,000 outdoor acres |
| Products allowed: | There are no formal rules, but hemp is reported to be grown for CBD extraction, seed or seed oil and fiber |

As of December 2017

**Minnesota does not require hemp processing licenses

MARKET CONSIDERATIONS

Minnesota hemp growers surveyed by Marijuana Business Daily report that the market is fetching:

- > No market price for flower, because processing doesn't exist
- > About 50 cents per pound of food-grade seed
- > About \$100 per ton of baled fiber

WHOLESALE PRICE BY PRODUCT



*Average price per pound

SOURCE: Hemp Industry Daily
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NEW YORK



New York joined the nation's hemp movement in earnest in 2017, when Gov. Andrew Cuomo invited hemp entrepreneurs to compete for \$5 million in development grants.

New York's investment to promote hemp cultivation and processing represented a national first. Most states have industrial hemp programs. But the programs are funded largely through fees paid by farmers to state departments of agriculture, with the growers getting little in return by way of promoting the plant or finding buyers or processors for the crop.

INDUSTRY SNAPSHOT

New York authorized hemp growing in 2015, allowing for up to 10 educational institutions, farms or businesses to grow and research hemp.

In early 2017, New York removed the 10-grower limit and opened the door to an unlimited number of cultivators.

Also last year, the governor announced the Industrial Hemp Agricultural Research Pilot Program, offering 10 grants for capital projects such as buying processing equipment. Those grants hadn't all been awarded as of the publishing of this report, though Southern Tier Hemp announced a \$650,000 grant in March to develop a factory near Binghamton to prepare hemp fibers and oils for further manufacturing.

New York received 100 applications to grow hemp for 2018 and 12 applications for additional processors, said Jola Szubielski, a spokeswoman for the state Department of Agriculture.

New York has no rules for how hemp can be used, and it is the only state with officially recorded hemp production devoted to consumption of the plant's leaves.

NEW YORK HEMP SNAPSHOT

Licensed Growers: **21**

Licensed Processors: **7**

Licensed cultivation space:
2,000 outdoor acres

Products allowed:
CBD Extraction
Seed or Seed Oil
Greens
Fiber

As of December 2017

MARKET CONSIDERATIONS

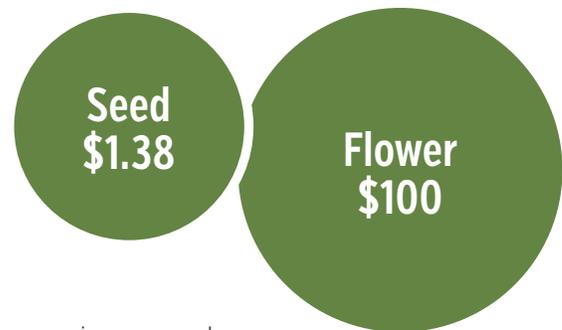
New York hemp growers report the market is fetching:

- \$100 or more per pound of dried flowers or buds for use in CBD extraction, with prices varying widely based on CBD content.
- 50 cents-\$2.25 per pound for seeds to be eaten as food products or pressed for seed oil.
- There is no reliable price for fiber, because fiber processors don't exist.

The hemp market in New York is currently strongest for seeds for use in food products. But some researchers say the strongest market potential lies in medicine.

New York's heavy research investment and existing manufacturing capacity could see the state make big gains over competitors that may appear to offer more room and a better climate for hemp.

WHOLESALE PRICE BY PRODUCT



*Average price per pound

SOURCE: Hemp Industry Daily
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NORTH CAROLINA



North Carolina has gone all-in on hemp, which state officials see as a natural fit for an economy once dominated by tobacco farming and textile manufacturing. North Carolina finished its hemp-growing season in 2017 with more growers, more acres and more processors than any other state in its first year of hemp production.

INDUSTRY SNAPSHOT

With a flexible no-deadline application process, no acreage minimum or maximum and a regulatory scheme that allows hemp growers to pursue any end product for their crops, North Carolina has seen strong interest from farmers wanting to grow the plant and entrepreneurs interested in processing it.

As in other hemp states, the initial value for growers in North Carolina seems to be in CBD oil extraction.

NORTH CAROLINA HEMP SNAPSHOT

| | |
|-----------------------------|--|
| Licensed Growers: | 97 |
| Licensed Processors: | 19 |
| Licensed cultivation space: | |
| | 1,930 outdoor acres |
| | 159,000 square feet of indoor greenhouse space |
| Products allowed: | |
| | CBD Extraction Seed or Seed Oil Fiber |

As of December 2017

MARKET CONSIDERATIONS

North Carolina hemp growers report the market is fetching:

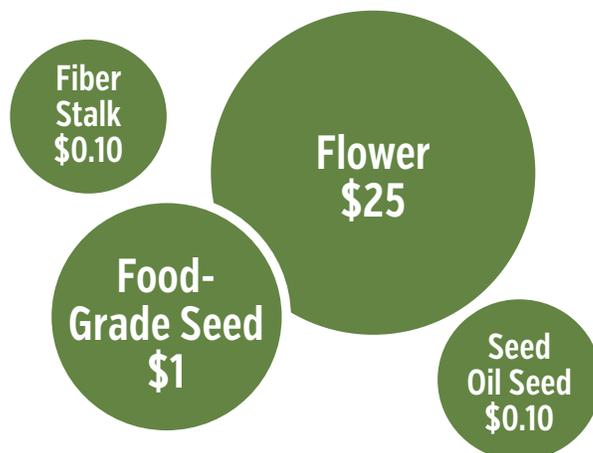
- About \$20-\$30 per pound of dried flowers or buds for use in CBD extraction, more if the plant CBD content is high.
- Less than \$1 per pound for seeds to be eaten as food products.
- About 10 cents a pound for stalks to be turned into fiber.
- About 10 cents a pound for seeds intended to be pressed for seed oil.

In North Carolina's first year, some growers reported losses from heavy rains, while others saw weeds and pests damage their first attempts to grow the crop.

In addition, North Carolina saw isolated thefts from hemp fields, likely from folks who confused hemp with marijuana.

North Carolina is likely to modify how it regulates hemp in coming years. Growers have been told to prepare for possible application deadlines – something they didn't have to face last year as the program was started too late.

WHOLESALE PRICE BY PRODUCT



*Average price per pound

SOURCE: Hemp Industry Daily
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TENNESSEE



Tennessee's high humidity and rainfall of 50-plus inches a year create a challenge for farmers looking to grow a plant that thrives in more arid climates. Still, Tennessee hemp entrepreneurs are hopeful as they try to develop cultivars for the damp environment.

The state permits valuable CBD extraction and has no legal impediment to selling finished hemp products, a huge boost for farmers that grow the plant.

INDUSTRY SNAPSHOT

Tennessee's hemp industry is much smaller than those in neighboring Kentucky and North Carolina.

Only about 20% of Tennessee's licensed hemp acres were in production last year – or just 130 acres of the 718 licensed acres.

The number of hemp registrants has grown since 2015, Tennessee's first year of experimenting with the plant in the modern era. But the number of acres is declining as farmers transition from fiber varieties to seed and flower varieties, which take up less room and produce more profit.

Tennessee allows indoor hemp production but has no estimate of how many square feet are being grown.

TENNESSEE HEMP SNAPSHOT

| | |
|-----------------------------|---|
| Licensed Growers: | 79 |
| Licensed Processors: | 38 |
| Licensed cultivation space: | 718 outdoor acres |
| Products allowed: | CBD Extraction Seed or Seed Oil Fiber |

As of December 2017

MARKET CONSIDERATIONS

Tennessee hemp growers report the market is fetching:

- About \$80-\$120 per pound of dried flower for use in CBD extraction – or even more if the plant CBD content is high.
- About \$10 per pound for seeds intended to be pressed for seed oil.
- About 19 cents a pound for stalks to be turned into fiber.

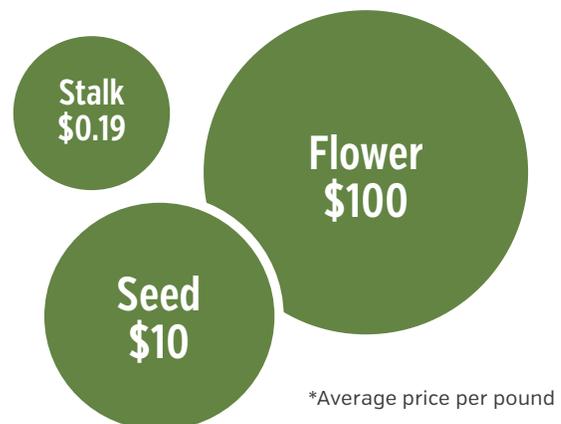
Despite challenges fighting mold and pests associated with high humidity, Tennessee hemp growers are bullish about the plant's potential. Tennessee has a strong history in the crop, and politicians and regulators have shown more enthusiasm for helping the hemp industry than in other states.

Hemp activists hope lawmakers will open more opportunities with a 2018 measure to allow the plant's use in animal feed, which officials with the Tennessee Department of Agriculture say is already being done in the state, though they declined to elaborate on how and where.

Agriculture departments in Oregon and Colorado rejected the idea, citing concerns that CBD could transfer to the animals.

Hemp activists cite a 2012 study on Canadian chickens that showed hemp in their feed increased beneficial omega-3 fatty acids in their eggs, with no side effects.

WHOLESALE PRICE BY PRODUCT



SOURCE: Hemp Industry Daily

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VERMONT



Vermont has the nation's loosest hemp regulations and a latitude that makes it an easy fit for hemp cultivars developed in Canada and northern Europe.

But Vermont's hemp growers have reason to worry, too.

And as the state implements regulations for recreational marijuana, hemp producers could be handed a whole new set of guidelines, with uncertain implications.

INDUSTRY SNAPSHOT

Vermont authorized hemp growing in 2013, but the state operates out of compliance with federal rules.

Vermont's hemp growers do not have to participate in a pilot project or a research collaboration with a university or state agriculture authorities – conditions laid out in the 2014 Farm Bill authorizing limited hemp production.

Interested hemp growers can get licenses for \$25 a year, with no background-check requirements or acreage limits.

Vermont growers have better access to viable hemp seeds than hemp farmers in other states. Because long-established hemp-seed producers in Canada and Europe are close in latitude to Vermont, seed acquired by Vermont growers can have higher germination rates than seed sown in states farther south.

The state does not actively research or monitor the plant.

Vermont agriculture officials also don't know how many licensed acres are actually in production, how much hemp its farmers are producing or where and how they're selling it.

Unlike other hemp states, Vermont does not require plants be tested to make sure their THC content is below 0.3%. Instead, Vermont tests hemp's THC content only at the request of law enforcement. That has happened only once, and the plants in question passed inspection.

In keeping with its laissez-faire hemp posture, Vermont also has no rules for how hemp can be used.

VERMONT HEMP SNAPSHOT

Licensed Growers: **90**

Licensed cultivation space:
560 outdoor acres

Products allowed:
There are no formal rules, but hemp is reported to be grown for CBD extraction, seed or seed oil and fiber

As of December 2017

MARKET CONSIDERATIONS

Vermont hemp growers report the market is fetching:

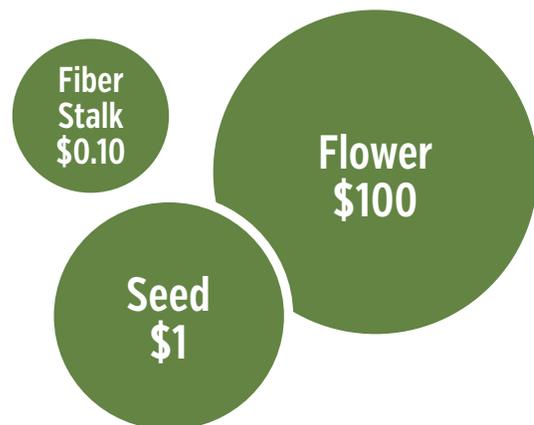
- \$100 or more per pound of dried flowers or buds for use in CBD extraction.
- 80 cents-\$1.20 per pound for seeds to be eaten as food products or pressed for seed oil.
- About 10 cents a pound for stalks to be turned into fiber.

The state's few hemp producers face increased competition from Vermont's larger neighbors, New York and Canada, both of which are making big investments in their hemp markets.

New York entered the hemp market in 2016 and made a big play for hemp development last year, with the governor personally inviting entrepreneurs to apply for grants aimed at building an industry.

Canada has a well-established hemp industry and imports just trace amounts of hemp products from the United States.

WHOLESALE PRICE BY PRODUCT



*Average price per pound

SOURCE: Hemp Industry Daily
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NEVADA



Hemp farms in rural northern and southern Nevada are struggling to keep up with booming demand for flower for CBD production. As a result, growers report prices of up to \$350 a pound for quality, high-CBD varieties – nearly 10 times what midgrade hemp flower sells for in Colorado.

Nevada growers are adding acreage and processing equipment – and hoping their luck doesn't run out before hemp growers in states with better water supply and milder temperatures overtake them.

But Nevada growers also are bracing for new entrants from California, and they're looking for new hemp uses in animal feed and industrial markets.

INDUSTRY SNAPSHOT

Nevada has allowed hemp production only since 2016, so the industry is still in its infancy.

Nevada regulators appear to have a hands-off hemp approach, probably because they're more focused on the state's nascent recreational marijuana industry. Nevada is working on issuing processing licenses and adding testing requirements patterned after states with more established hemp programs.

NEVADA HEMP SNAPSHOT

| | |
|-----------------------------|--|
| Licensed Growers: | 23 |
| Licensed Processors: | 0** |
| Licensed cultivation space: | |
| | 490 outdoor acres |
| | 17,170 square feet indoor greenhouse space |
| Products allowed: | |
| | Flower Seed or Seed Oil Fiber |

As of December 2017

**Nevada does not require hemp processing licenses

MARKET CONSIDERATIONS

Nevada hemp growers report that the market is fetching:

- > \$200 or more per pound for flower, depending on CBD content and quality.
- > About \$10 per pound of food-grade seed, or \$45 per gallon for seed oil.
- > About \$200 per ton of baled fiber.

With expectations for an influx of competition, the Nevada hemp industry is already looking for new markets and opportunities.

Some growers are experimenting with mixing hemp fiber with bentonite, a clay mineral abundant in Nevada and commonly used in pet litter and cosmetics. Others are researching hemp use in animal feed.

Other companies plan to sell their CBD products to international markets, notably Europe.

WHOLESALE PRICE BY PRODUCT



*Average price per pound

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NEW AND EMERGING MARKETS

The entire U.S. hemp industry is new and emerging, given that modern production of the crop was authorized only in 2014. While the top 10 presented earlier in this report are the most developed, there are some additional states where conditions are ripe for a thriving hemp industry in the years to come.

Some are moving to expand hemp production dramatically; others are experimenting with new uses for the plant or have academic institutions giving special attention to hemp.

Here are some of the key states we think you should be watching.

ARKANSAS



Arkansas could allow its first modern hemp crop in 2018, with production rules awaiting final signoff by Gov. Asa Hutchinson. At least one Colorado hemp biotech firm pulled up stakes and moved to Arkansas early this year to take advantage of a new market with plenty of fertile land and a low-cost labor force.

As of this report, though, Hutchinson held the hemp rules in limbo. The governor said in February that he wouldn't implement the program until he is satisfied that the U.S. Drug Enforcement Administration won't interfere, an uncertain prospect.

CALIFORNIA



The undisputed heavyweight champion of the marijuana industry, California has more than 68,000 registered marijuana growers, plus a thriving network of an unknown number of home growers.

So it may surprise some that California's hemp industry is still very nascent. California didn't start a commercial hemp program until 2016, when voters approved hemp language that was tucked into a larger measure legalizing recreational marijuana.

The nation's most populous state has yet to license a single hemp grower, deferring to local authorities. At least two California counties, Shasta and San Joaquin, have since banned industrial hemp production. And California hemp law does not allow hemp flower production, eliminating the plant's most valuable use - CBD production.

The state has a newly formed California Hemp Association, helmed by a retired Apple executive. According to Marijuana Business Daily projections, California marijuana will generate more than \$4 billion in annual retail sales within a few years.

PENNSYLVANIA



Pennsylvania entered the hemp industry in 2017 but is ramping up quickly. The state recorded just 14 hemp plots of less than 5 acres each in 2017, but it has licensed 39 hemp projects on up to 100 acres each this year.

Pennsylvania also boasts some serious academic weight, with Lehigh and Thomas Jefferson universities working with the Pennsylvania Hemp Industry Council to develop a large hemp research facility in the southeastern part of the state. The universities have said they plan to seek [note: approval instead of designation?] designation by the U.S. Department of Agriculture to make the hemp project a "Center of Excellence," which could unlock the first modern federal research dollars in the hemp industry.

SOUTH CAROLINA



Twenty farmers in South Carolina have been cleared to grow hemp on about 350 acres in 2018 – the state's first foray into the industry. Interest is strong, with 130 farmers applying for those 20 spots. Production could boom when the cap is lifted.

VIRGINIA



Virginia bans commercial hemp production. The state reported less than 100 hemp acres in 2017 and just 33 licensed growers, all cultivating the crop on behalf of university research. But this former tobacco powerhouse is worth watching.

Virginia grew 23,000 acres of tobacco worth \$110 million last year, according to the U.S. Department of Agriculture, and hemp has shown promise in areas once dominated by tobacco farming. Agriculture officials have said they may suggest ways to expand opportunity in hemp production, though specifics are still elusive.

The University of Virginia planted hemp on contaminated mining land, making it the only institution nationwide thought to be exploring hemp applications for waste cleanup, called phytoremediation. Those trials are expected to continue in 2018, though market potential for phytoremediation with hemp plants is unknown.

WASHINGTON STATE



Washington didn't authorize hemp production until 2016 – four years after voters approved recreational marijuana. The marijuana pioneer still doesn't allow hemp to be grown for flower, the most valuable part of the plant.

In 2017, Washington had just seven growers on 175 acres. Two of the seven growers were universities carrying out limited research projects. The Washington Department of Agriculture reported collecting about \$8,000 from hemp licenses but spending \$146,000 on hemp oversight.

There's no reason to think Washington can't catch up in the hemp industry, though. Washington has a thriving timber industry and plenty of wood-processing infrastructure, some of which may be convertible into fiber processing, which has been a challenge for many other hemp markets. Some hemp entrepreneurs in Washington say this state could see triple-digit hemp acreage growth in the next few years.

WISCONSIN



Wisconsin is moving faster than any state yet to allow the new industry to take root. Gov. Scott Walker signed a law allowing hemp production at the end of November 2017, and within four months, the state began accepting applications for the 2018 growing season.

State agriculture officials say it's too soon to know how many acres could go into hemp this year – applications aren't due until May – but they say interest has been overwhelming. At a single agricultural expo in Milwaukee in March, the agency handed out about 250 applications to grow the new crop.

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