

2020 Hemp Production Survey

Summary of Findings

The Jacobsen has been reporting on the emerging hemp industry since July of 2019, after the legalization of hemp production nationwide. Pricing for hemp and derivatives was artificially high prior to the passage of the 2018 Farm Bill and remained so through planting last year. Midsummer, reports of extraordinary acreage made headlines, as people continued to stream into the space looking for a niche to carve out. The frenzied pace was driven by public agencies and hemp advocates alike, with very few voices of reason warning about the basic principles of supply and demand. These voices were generally not welcomed at national conferences, it seemed as if hemp could not lose. In July, the perception of oversupply, along with extraordinary inventories of derivatives, caused pricing to plummet.

Hemp has not lost by any means, but a market correction, if one can characterize a barely conceived market in that way, was guaranteed. The volatile cannabinoid segment has been the key driver, with retail markets that were not fully understood, and where demand today remains unclear. The arrival COVID-19 in the US has altered markets for the long term, also in ways that aren't yet known, though some aspects are becoming clear. One example is the extraction segment pivoting to hand sanitizer, providing a key infusion of cash flow for businesses that are highly capitalized, and were developed on the premise of \$4000/kilo isolate.

Of course, there are businesses with a much more calculated game plan and a long-term outlook. For these, accurate pricing is essential for business planning. Private capital fueled the growth of many medium and large CBD companies, based on speculation and hype rivaled only by tech. Traditional bank finance is now stepping in to fill the void filled by retreating investors, requiring operators to dial in their business planning, supported by real world numbers. PPP loans emerged rapidly and privately funded businesses were sent scrambling trying to ready themselves for loan applications. Businesses with existing relationships with banks, either hemp related or otherwise, are far better positioned for jumping on the evaporating pot of SBA administered money.





The daily Hemp Bulletin pricing and commentary generally covers more immediate influences in markets, with a nearer-term outlook. The Jacobsen's Market Intelligence reports are longer-term in scope, looking at macro influences based on fundamentals of supply and demand. Our production and processors surveys are a key element to developing our long-term outlook in hemp. Forecasting is perhaps presumptuous in this nascent market with no historical numbers to utilize, so it will take some time and increased data for us to effectively forecast to the level of accuracy we achieve in our mature commodities in our portfolio. For now, we offer these Market Intelligence reports that leverage our comprehensive supply and demand balance sheets, supported by survey data that we are presenting here. This report, in particular, is a complimentary report for survey participants, in hopes that readers will see the value of consistently participating in our concise surveys, as over 400 did in this initial production survey. This survey will be followed with a midsummer planting survey, and one following autumn harvest.

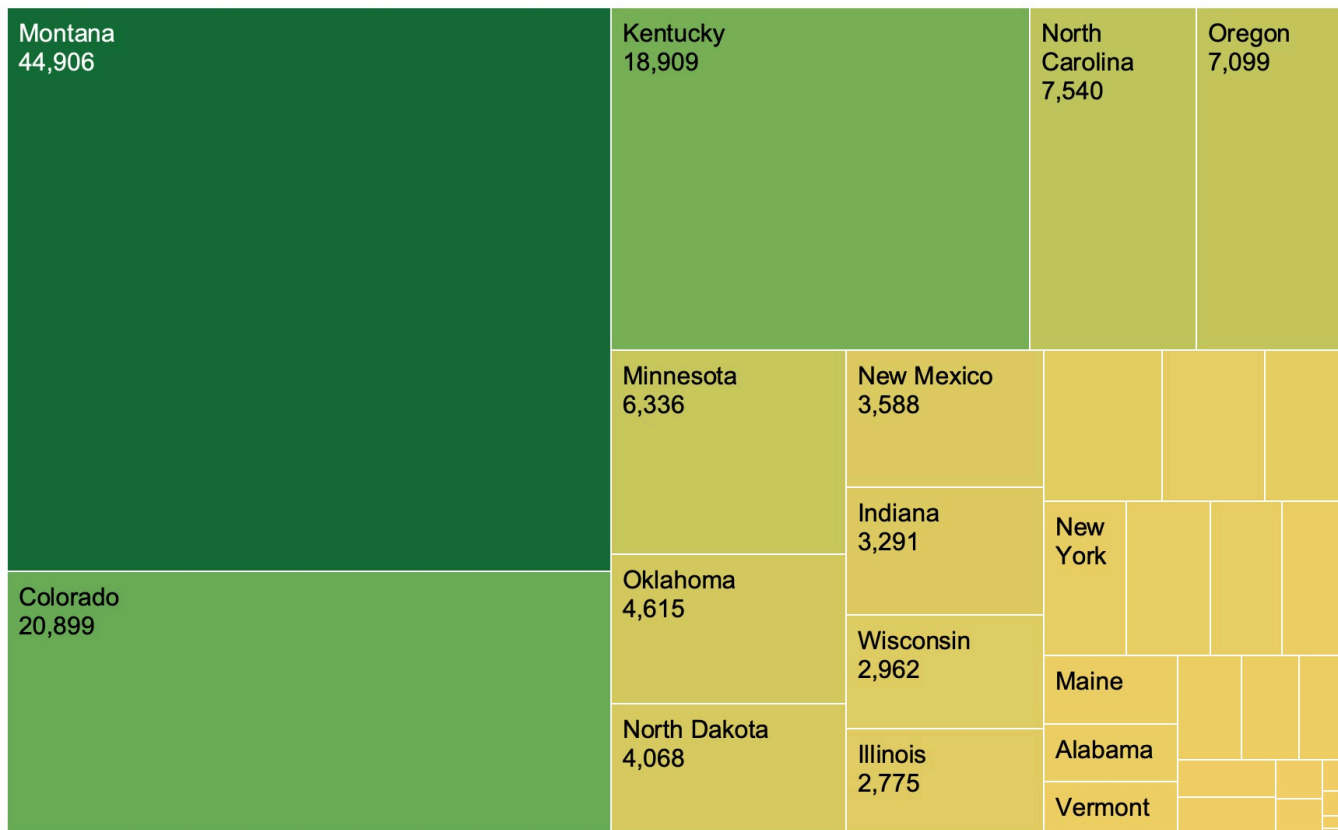
Chase Hubbard

Senior Analyst at The Jacobsen
Industrial Hemp

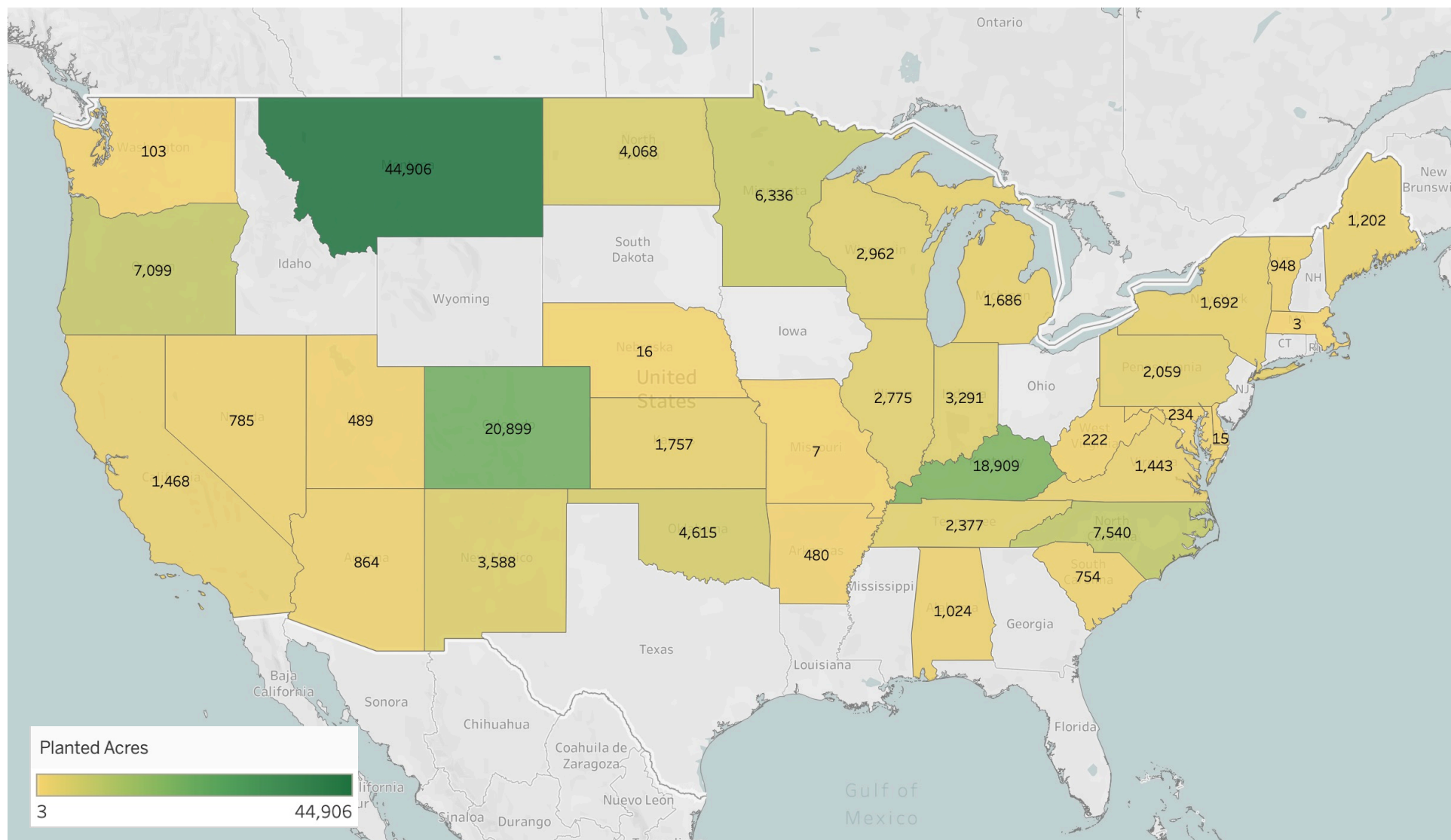
Hemp Acreage 2019

Acreage last year made headlines, as states saw permitted acreage grow at astonishing rates. In the end, states reported over 500,000 acres permitted for hemp production, with notable increases in Oregon, Montana, Colorado and Tennessee. Many states saw ten times the number of permitted acres in 2019 compared to 2018. But permitted acreage does not give an accurate picture of supply. Producers permitted much more than they eventually planted, which is an understandable approach given the permitting process. Better to have more options, farmers believed. In late summer, we saw acreage numbers posted by the Farm Service Agency (FSA), which they do for a number of crops, most of which have a long history and associated programs administered by FSA, including

crop insurance. The agency reported 146,780 acres planted in 2019, but this data was skewed. In states like Oregon, tens of thousands of acres went unreported since the acreage accounted for new farmers or cannabis farmers, neither of which have a relationship with FSA. Acreage reporting to FSA is compulsory in 2020, built into the Interim Final Rule (IFR) published by USDA in October. Fortunately, the agency will be recording intended use as fiber, grain, seed, or cannabidiol.



Below we can see the acreage as reported by FSA by state. Grayed states had no activity in 2019. Montana shows almost twice as much acreage as Colorado in 2019, but Colorado acreage is underreported, and Montana acreage is likely over-reported in terms of actual acres planted. Harvested numbers are a much different story. It is likely that 2019 saw less than 200,000 acres, with perhaps half of that harvested.



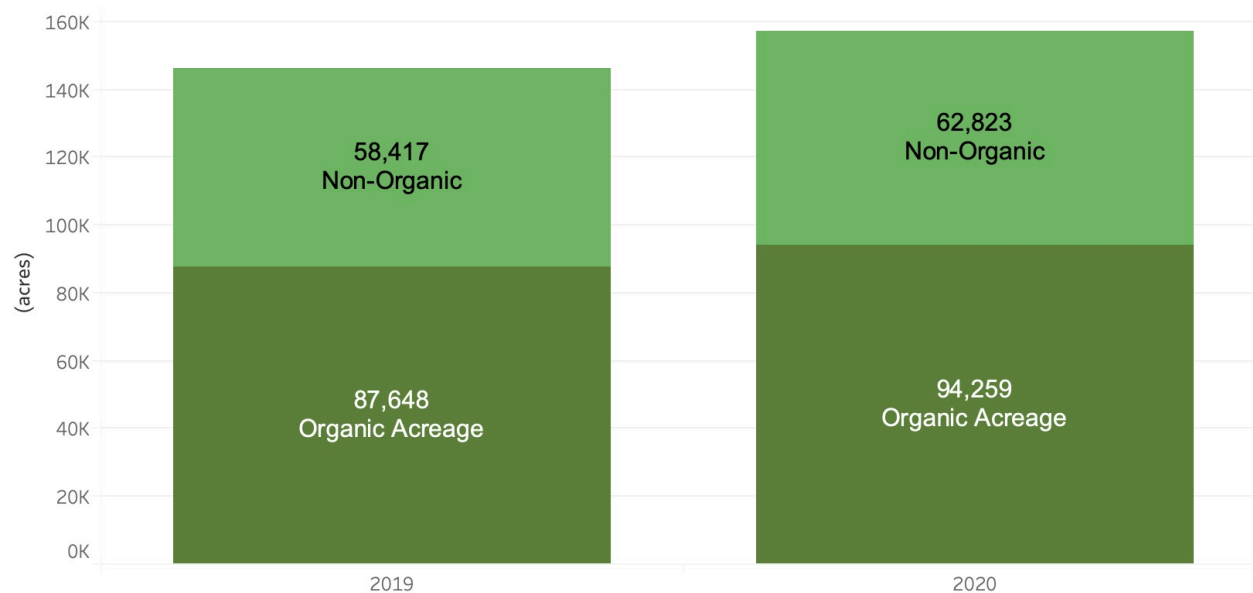
Hemp Acreage 2020

The Jacobsen's current estimate for planted hemp acreage in 2020 is projected to be 157,082. This number may change as we continue to develop our MI Reports, and as we learn planting number midsummer. Tier 1 subscribers will see state level detail in the full May report.

Organic vs Non

The majority of US hemp acres are managed organically. We realize that not all of reported organic acreage is certified organic, though certified acreage is growing rapidly. An organic supply chain is emerging, including extraction facilities that produce certified organic extracts. This is a key strategy for market participants looking for marketing advantages, but there are also principles and practical considerations at work. Organic hemp extracts by their nature are more desirable, and given the concerns for bioaccumulation, the production method is a better fit for dietary supplements. Additionally, few pesticides are approved for hemp, all but one being OMRI approved for organic production.

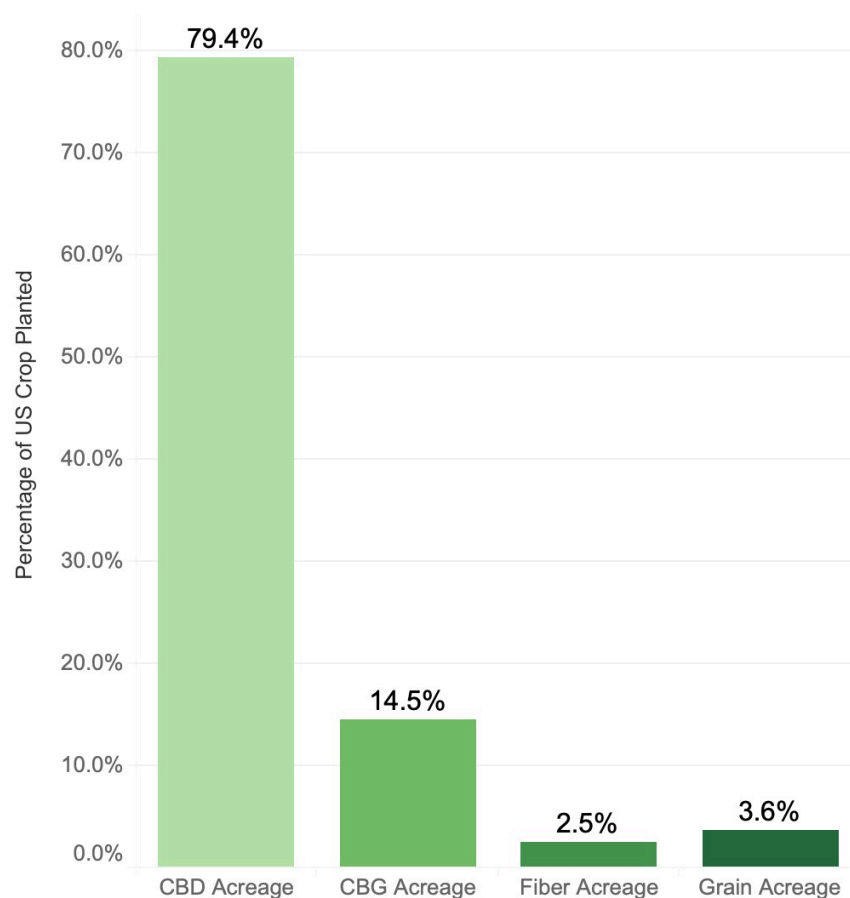
Hempseed grain production is also predominantly organic, again, partly a function of available agrochemicals. That premium market, with pricing double of conventional, requires certification. In the Northern Plains and Upper Midwest, relatively clean fields make organic hempseed production a practical choice, given the lack of crop protectants. As fiber production increases in the US, and as conventional crop protectants gain approval, the ratio of organic to conventional hemp acreage will likely shift to conventional. For many organic producers, hemp is a welcome addition to their crop rotations both for its impact on soil structure and for breaking pest cycles.



Breakdown of Crop

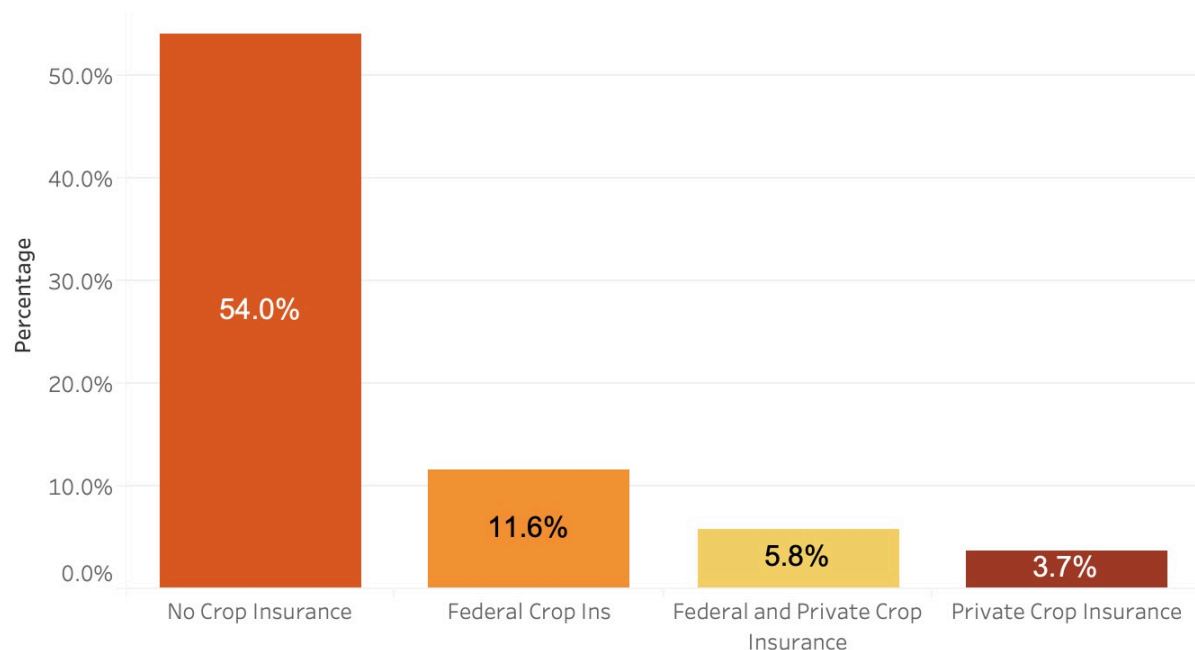
The bulk of the 2020 crop will again be dedicated to cannabinoid production. Just over 6% of 2020 acreage is destined to be planted to grain and fiber varieties. Based on our survey results, 14.5% of the intended 2020 crop is comprised of CBG dominant genetics. Seed companies have actively marketed CBG seed this year with some sellers reporting as much as half of any given order comprised of CBG seed. Producers are still experimenting with various hemp genetics, and some acreage will be planted to minor cannabinoids, including CBG which will be the lion's share in this category. Retail markets for CBG are developing but are sparse now, precluding any significant demand for the material. THC compliance is a factor in selecting CBG dominant varieties, as these plants generally show lower levels of THC, though this is impacted by the same factors that can influence THC content in other varieties.

Farmers are actively trailing grain and fiber on their farms, some on just several acres, and in areas with no active markets. This gives them time to develop production systems using their current equipment line, and to address any shortcomings or challenges discovered during field operations. Domestic hempseed grain merchandisers are working to increase contracted acreage in 2020 so we will see some increase in hempseed production. Hempseed prices have been steady, and there is theoretical global demand, especially for hempseed oil. Montana is a key hempseed grain producing state along with North Dakota and Minnesota. Montana has initiated the first checkoff program in the US, which could open doors for expanded hempseed marketing. There is limited demand for fiber at this point, and it will take years for this segment to develop. Once companies with market ready products seek out contracts for raw hemp fiber, acreage could increase dramatically in a very short period of time, since haymaking equipment and knowledge allow producers to jump right in without fears of bottlenecks seen in CBD.



Insurance Coverage

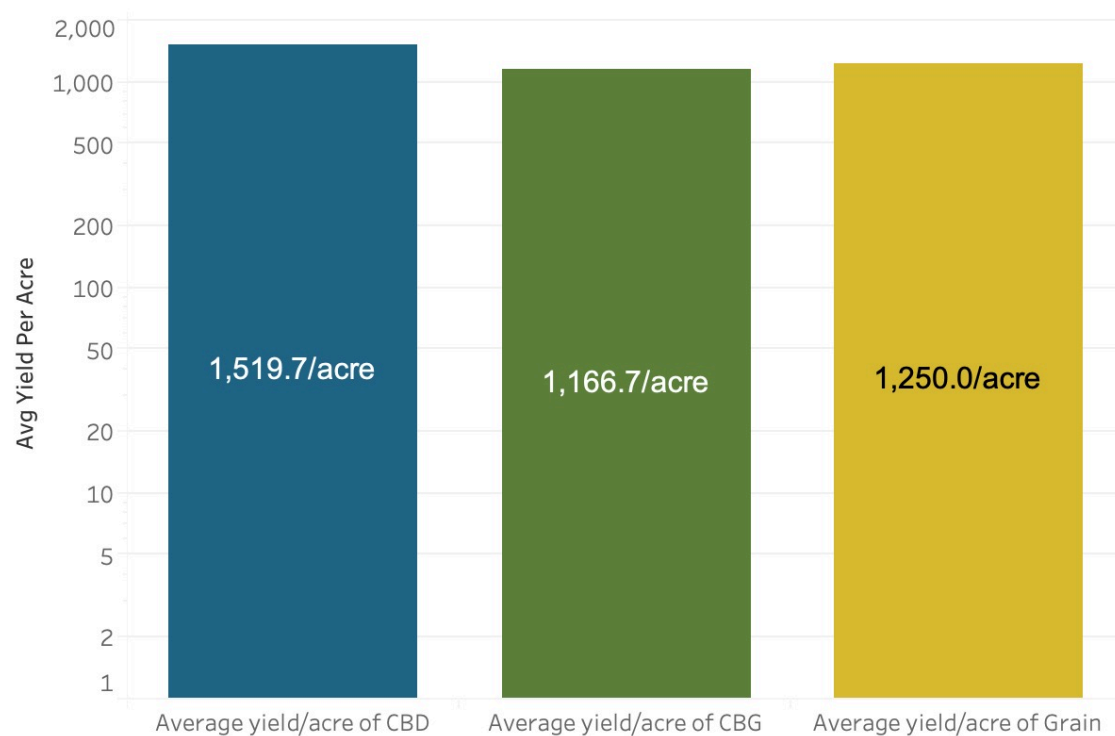
Just over 20% of acreage reported by respondents will be covered by any form of crop insurance in 2020. Growers utilized private insurance in 2019 to some extent, with claims in Central Oregon following a hailstorm there, but very few acquired policies last year. The federal program was developed in a very short period of time, but the marketing contract requirement for underwriting precluded most farmers from participating in the new program. Farms with federal policies in 2020 tend to be larger and part of a diversified operation, typically with an existing relationship with FSA.



The inability to insure crops that are destroyed due to THC spiking is another deterrent. These programs rely on past data on production and pricing, of which there is precious little. Because genetic instability, weather, and agronomic practices all can influence THC levels, the program cannot practically cover this now. As the industry and markets develop, so will the Federal Crop Insurance Program for hemp, and participation in turn.

Yields

Average yields reported by survey respondents can be seen in the adjacent graph. The average for CBD is more than expected, given that much of the acreage went unharvested. In new hemp growing areas, yields were often less than 1000 lbs/ac. Growing conditions vary widely from location to location, with 3000 lbs/acre not unusual on good soils and under competent management. CBG yields were lower than that of CBD varieties, and may be a result of earlier harvest.



Survey Averages

THC compliance will continue to be a critical issue for hemp producers, creating more risk with new testing guidelines in the IFR. On average, producers plan to test their crops 2 times in 2020, showing the management approach by a majority is to use minimal testing. Larger producers commonly test in-house with expensive HPLC equipment, and test more frequently, commensurate with the risk of growing large acreage of cannabinoid hemp. An average of .67 acres of hot crop per respondent were destroyed in 2019. Our data shows that well over 25% of growers had a crop test hot in 2019, but it is unclear if this was from cherry-picking top flowers, whether the test had consequences, as some were only in-house results, and also by what standard the crop tested hot. States have generally reported less than 15% of crops testing hot in 2019. Many states will be on the total THC standard this year in lieu of the delta-9 standard, but like 2019, state hemp regulations vary. Some states will continue to test this year on a delta-9 standard, and likely with some potential for rounding down.

Thanks to all of you for participating in our production survey, we hope these results are useful in your planning. Please look out for our mid-season plant survey, for which we will also provide you with survey results. More in depth analysis will be available in our Market Intelligence reports for Tier 1 subscribers and will be released later this month.

Chase Hubbard, Author



Senior Analyst - Hemp
chase.hubbard@thejacobsen.com

Chase Hubbard earned his degree in Sustainable Agriculture from Warren Wilson College in Asheville, NC and later completed NC State's Agricultural Leadership Development Program. His career in farm management -- including a broad range of crops, livestock, and markets -- received widespread local and national recognition for progressive agricultural practices and for mentoring young farmers. Chase's unique perspectives in agriculture result from deep sector knowledge across many commodities and geography, ranging from Western North Carolina to Latin America and Southeast Asia. In addition to farming full-time, he served as an elected Soil and Water Supervisor, and in appointed leadership roles for local/state agricultural committees and commodity groups. Chase is now covering the emerging hemp industry for The Jacobsen.