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Industrial Hemp: Overview of Opportunities and Risks

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Key Points:

- Any nascent industry has inherent risks, but regulatory and legal hurdles compound the risks for the hemp industry. However, with big risks can potentially come big rewards. Opportunities and risks should be evaluated case by case.
- Of the three markets for hemp – fiber, grain/seed, and CBD (cannabidiol) – CBD demand is currently driving hemp’s growth. Though widely available in the marketplace, CBD in food, beverages, and dietary supplements is still federally illegal. The timing and outcome of future FDA regulation will be critical to the long-term CBD demand outlook.
- Hemp fiber has potential long-term market opportunities; a significant barrier, however, is the lack of processing capacity today. Grain/seed hemp has more stable risks and demand markets than hemp fiber or CBD, but not the growth potential of either.
- USDA plans to release hemp regulations and guidance in the fall of 2019, in time for the 2020 growing season. The USDA and the FDA regulations will not only be crucial in determining risk and defining the outlook of the hemp industry, but also in setting a path forward for leaders to finance hemp.

Introduction

Along with the hype around hemp comes a lot of false, outdated, biased, or contradictory information. Understanding that sound data and information is limited, and each day brings new information and innovation, this report is intended to provide a foundation to understand key nuances of the growing hemp market and highlight key business risks and opportunities. This report is intended as informational only and is not intended to represent any official policy or procedure on behalf of CoBank or its Farm Credit partners.

Background

The 2014 Farm Bill allowed institutions of higher education and state agriculture departments to launch pilot programs for hemp research. Since the 2014 Farm Bill passed, U.S. hemp acreage has increased exponentially, increasing almost 70,000 acres (680%) between 2016 and 2018 (*Exhibit 1*). Currently, hemp production is still regulated under the 2014 Farm Bill and the 45 states that chose to have programs established thereunder.

In December 2018, Congress passed the 2018 Farm Bill which removed hemp from the controlled substances list. Federal regulation of hemp moved from the Drug Enforcement Administration to the USDA. USDA is now working on its regulations and guidance to be released in the fall of 2019. Each state will then have the option to either submit its own plan to be approved by the USDA, opt in to the federal plan, or prohibit hemp production.

Market Opportunities

Three main types of hemp are grown for different markets: fiber, grain/seed, and cannabidiol (CBD).

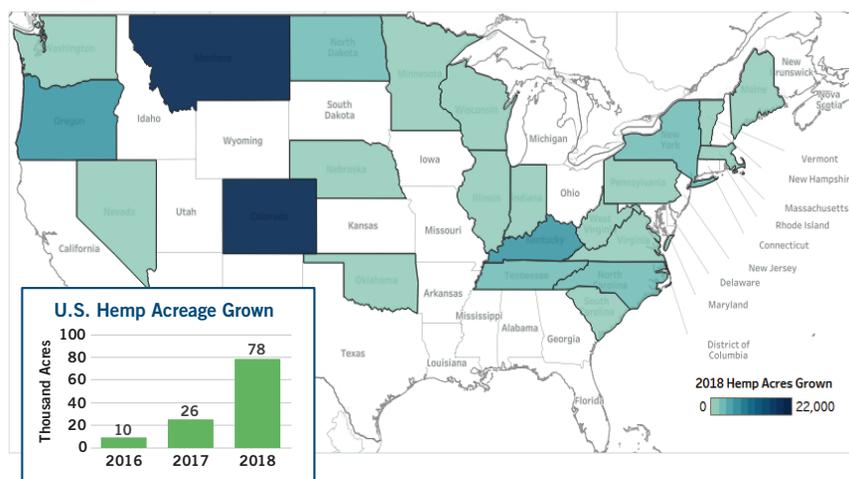
CBD, the Current Demand Growth Driver

Of the three markets for hemp, CBD demand is currently driving hemp's growth. Despite relatively loose enforcement, CBD is still federally illegal in food, beverages, and dietary supplements. The Food and Drug Administration (FDA) recently announced it will speed up efforts to create a regulatory framework, but in reality permanent regulation is not likely to happen within the next year, as long-term impact studies are needed to determine safety and efficacy of therapeutic claims.

Primary compliance requirements for CoBank customers participating in the industrial hemp pilot program

- Be licensed and compliant with the 2014 Farm Bill, which allows industrial hemp production for research under state pilot programs.
- Operate in a state and county with an approved license-granting industrial hemp program.
- Ensure the hemp license is in the same name of the entity operating the business.
- Send/receive all hemp-related cash activity within the licensed entity only.

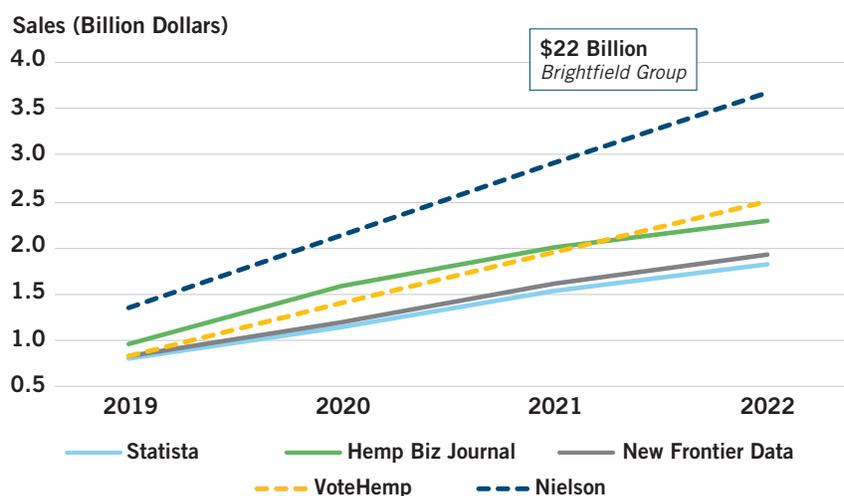
EXHIBIT 1: U.S. Hemp Acreage



Sources¹: Vote Hemp

CBD demand has boomed as a popular “cure-all” for a multitude of health issues and ailments. CBD sales projections range widely across industry sources, from \$1.8 billion to \$22 billion by 2022 (*Exhibit 2*). Producers are paying attention. In Kentucky for example, over 70% of the hemp acres are CBD hemp, and this percentage is expected to grow in the coming years.²

EXHIBIT 2: CBD Sales Outlook



Note: Dotted lines represent linear interpolations between project points given by the data source.

Sources³: Statista, Hemp Business Journal, New Frontier Data, Vote Hemp, Brightfield Group and Nielsen.

Despite the high production costs and risks (outlined in the next section), large potential returns are enticing farmers to give CBD hemp a try, and most are wisely starting with relatively small acreage plots. Gross CBD hemp revenues range greatly depending on the concentration of CBD and individual processor contracts. These contracts can – among many things – vary in terms of the levels of risk and farm production cost held by the processor.

Through interviews and anecdotal research, CoBank has found that for a farmer taking on the majority of the production risks and costs (which can be extremely high), 2018 CBD prices commonly reported in the range of \$3-\$5 per percentage point of CBD concentration (within the dry flower). For 10% CBD yielding 2,000 pounds of dry flower per acre, that equates to \$60,000 to \$100,000 of gross revenue per acre (before expenses). While most in the industry do not expect these prices to last and prices will come down significantly, plenty of people are looking to take advantage of the short-term opportunity.

Fiber May Hold Longer-Term Demand Potential

Textiles are the best-known application for hemp fiber. A new technology touted by Levi's is working to make hemp more consumer-friendly with environmental advantages over cotton. However, there are notable challenges in competing against cotton and its well established large-scale supply chain. A bigger opportunity may be in hemp biocomposites and other industrial applications. Recently, BMW released its i3 electric car made with hemp-based biocomposites. While hemp can be used in combination with other plant materials such as soy, canola, and corn, BMW used hemp

with thermoplastics. BMW claims the resulting material is two to three times stronger than steel, reduces the vehicle weight, and increases the distance the electric car can travel between charges.

Grain/Seed as a Protein Source

Grain/seed hemp currently has a better rate of return than fiber but less than CBD. Grain/seed hemp has more stable risks and long-term prospects than hemp fiber or CBD, but not the growth potential of either. Hemp seed is claimed to be a super food that is high in fiber, protein, omega-3s, and essential fats. Hempseed cake could potentially be a viable protein source in animal feed once it is approved by the FDA as a commercial feed ingredient. Its protein content is typically cited at around 30%, which is less than soybean meal, but studies show hemp seed is a more digestible protein.⁴

Risks and Uncertainties

While the potential opportunities within the hemp industry are abundant, with big reward comes big risk. Any industry in its infancy has inherent risks, but the risks for the U.S. hemp industry are compounded by legal and

regulatory hurdles. While not every risk will apply to every situation, the table below highlights a few key potential risks and unknown variables to keep in mind. This table does not represent a comprehensive list of all risks.

Type of Risk / Uncertainty	Level of Risk			Description
	Fiber	Grain/ Seed	CBD	
International Competition	Med	Med	High	<ul style="list-style-type: none"> Hemp industries in Europe, China, and Canada are more mature, and growth rates have been relatively modest over the past five years. Hemp acreage across key producing countries/regions reached nearly 400,000 acres in 2017 (<i>Exhibit 3</i>). CBD production is currently labor intensive, giving an advantage to countries with lower labor costs (e.g., China).
Demand Risk in Each Market	Low	Med	High	<ul style="list-style-type: none"> Fiber and grain/seed hemp would be used in relatively well-established markets (depending on usage) with low regulatory hurdles, though hemp meal is not yet allowed in commercial animal feed. Future CBD demand is less certain. Issues include product efficacy claims not supported by scientific research, false marketing of CBD products that do not actually contain CBD, and the big issue: CBD is not technically legal for use in food, beverages, and dietary supplements. Longer-term CBD demand will depend on studies and pending FDA decisions.
Processing Infrastructure	High	Low	Med	<ul style="list-style-type: none"> A facility capable of processing canola should be able to process hemp grain/seed. Hemp fiber has a severe shortage of processing infrastructure (decortification facilities). With the rapid growth of CBD hemp production, the risk is lack of processing capacity. Most CBD processing is not currently at an economically efficient scale. However, one processor has purchased a 1.2 million square foot processing facility in Houston to process CBD.⁶ This level of larger-scale processing would not only be more efficient, it would allow for lower levels of CBD concentration which in turn would reduce farm costs. At the front end, contracts should cover the necessary details, be understood by all parties, and only be entered into with trusted partners. At this time, the uncertainty around current and future FDA regulation of CBD increases the risk profile of lending to CBD processors, particularly in cases which CBD would be the primary source of collateral. An open question is what role the USDA can play in helping to establish a processing industry.
Seed	Low	Low	High	<ul style="list-style-type: none"> While seed sizes and germination rates are highly variable, seed for fiber and grain/seed production is not a significant barrier. For CBD production, feminized seed or clone availability is limited, seed costs are high (approximately \$1/seed), and germination rates are variable. Producers have reported some suppliers providing false feminized seed and/or seed with lower than advertised germination rates. Certified seed is currently limited in the U.S. because it takes several years to certify seed, and legal hemp production only started in the U.S. in 2014. While seed is available from other countries, it is not always well-adapted to regional growing conditions. The development of certified seed, or until then, a list of reputable seed suppliers and/or seed varieties, would help reduce some of this risk.

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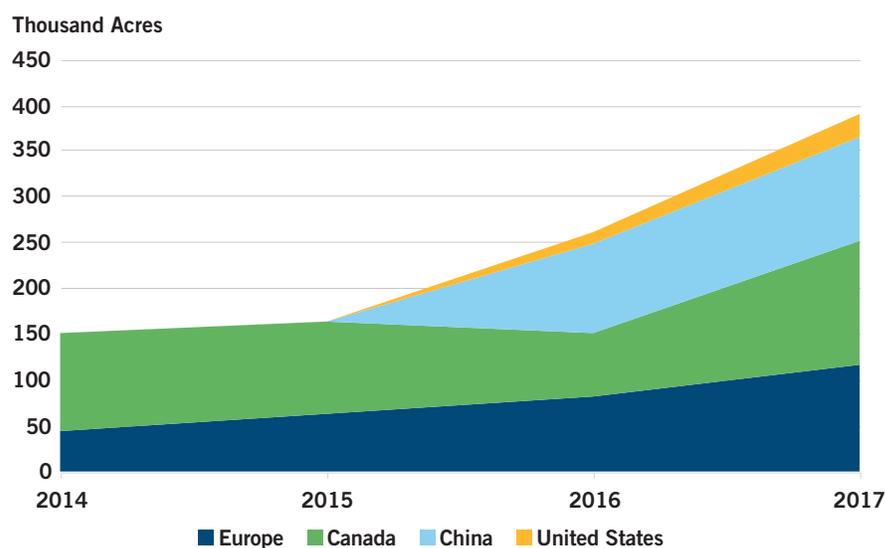
Type of Risk / Uncertainty	Level of Risk			Description
	Fiber	Grain/ Seed	CBD	
THC Limit	Low	Low	High	<ul style="list-style-type: none"> The risk of testing as a “hot crop” (THC levels above 0.3%) is a bigger issue for CBD hemp production than fiber or grain/seed varieties (<i>Exhibit 4</i>). Currently, each state has different costs and procedures related to sampling and THC testing. The industry hopes to see USDA regulation address standardized testing across states. If a hemp field tests as “hot,” some states currently allow for a re-test and others do not. This provides an inherent advantage for re-test states. If the USDA allows an alternative to destroying a hot crop, such as producing building materials, it would significantly reduce financial risk.
Market Information	Med	Med	High	<ul style="list-style-type: none"> Transparent market information is currently lacking. Available information is often false, outdated, biased, or contradictory.
Pricing	Med	Med	Med	<ul style="list-style-type: none"> Lack of transparent market information adds additional price risk. The majority of hemp will be grown under contract with legally enforced specifications, which is not the norm for most field crop producers.
Crop Insurance	Med	Med	High	<ul style="list-style-type: none"> Federal crop insurance is not currently available for hemp. While some form of federal insurance is expected for crop year 2020, it will likely be a few years until true multi-peril options become available and they will be limited compared to traditional crops. Private companies have developed hemp insurance policies.
High labor costs	Low	Med	High	<ul style="list-style-type: none"> Lack of approved crop protection chemicals and limited harvesting equipment means CBD production is labor-intensive. It is important to understand the labor needs and availability.

Until additional laws and regulations are developed to address banking/anti-money laundering issues, borrowers need to consider the increased scrutiny industrial hemp banking transactions are under.

Hemp is not Marijuana

While marijuana and hemp originate from the same family (cannabis) and look and smell the same, there is one key difference - hemp cannot get you “high.” Hemp can only contain 0.3% of Delta-9 Tetrahydrocannabinol (THC), which is the psychoactive element in marijuana. While low in THC, hemp contains higher concentrations of another non-intoxicating cannabinoid known as cannibidiol (CBD).

EXHIBIT 3: Historic Hemp Production by Key Producing Countries



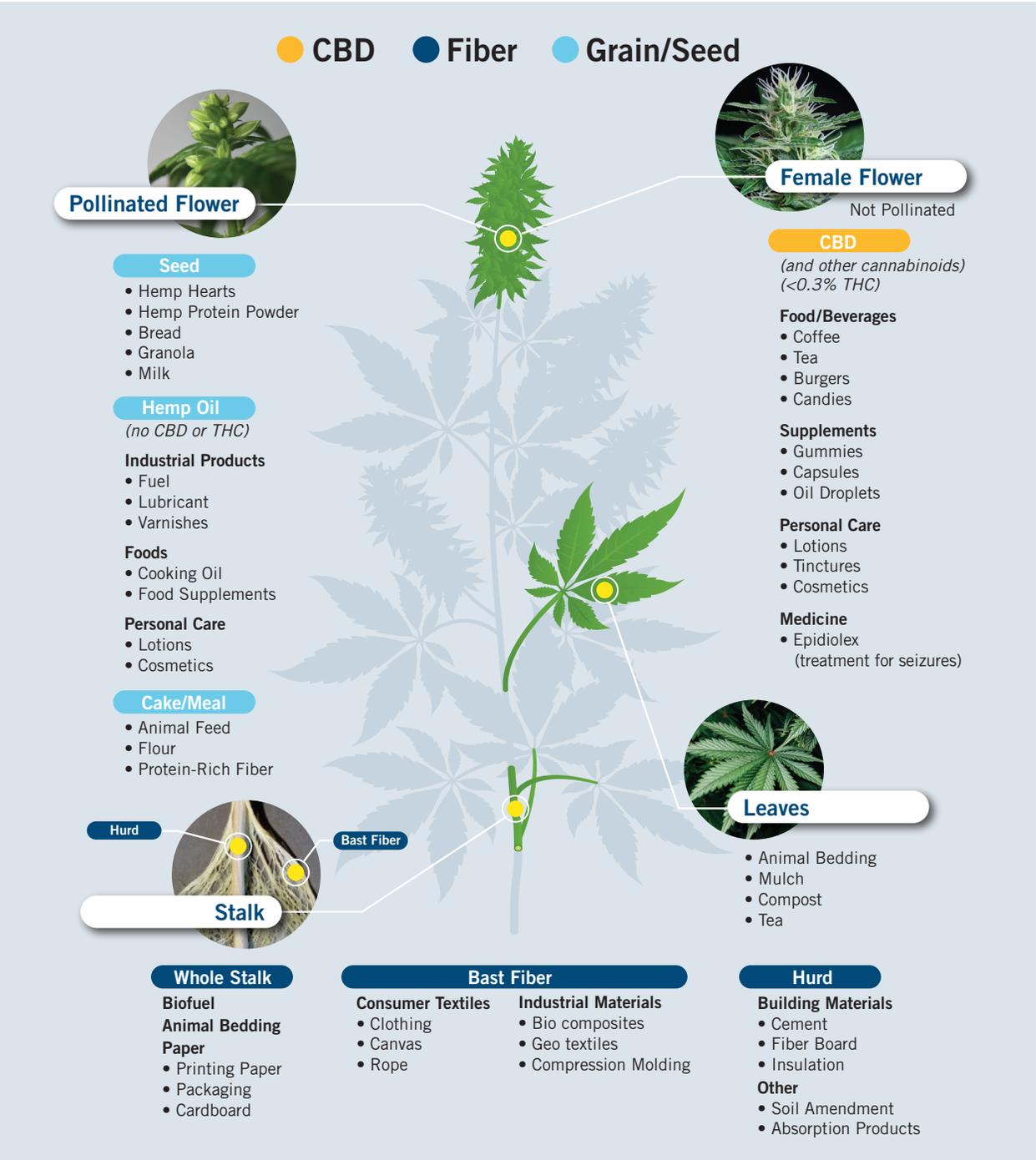
Sources⁵: EIHA (Europe), HempAlta (Canada-2014), various articles (Canada - 2015 & 2016), Health Canada (Canada 2017), New Frontier Data (China), and Vote Hemp (U.S.).

What's in a Hemp Plant

There are three main types of hemp grown for different markets: fiber, grain/seed, and CBD. Here is how the

parts of the plant are used and examples some of the 50,000 potential uses.

EXHIBIT 4: The Hemp Plant



Sources: CoBank Knowledge Exchange

Conclusions

Hemp is not a single crop or market. Rather, three main types of hemp are grown for different markets – fiber, grain/seed, and CBD – each with their own set of opportunities and risks that should be assessed individually, case by case.

CBD is currently driving hemp production growth. While the market opportunities for CBD hemp are huge, there are many risks to carefully consider. CBD could be a short-term boom or a solid long-term market, depending on what FDA studies determine. In addition, there are many other risks and uncertainties throughout the supply chain highlighted in this report including: high seed costs, intensive labor requirements, lack of transparent market information, seed suppliers selling false feminized seed or seed with lower than advertised germination rates, and the risk of having to burn the crop if THC levels test too high.

Hemp fiber is facing significant processing infrastructure constraints, but may have overlooked longer-term growth opportunities outside of the textiles market (such as

biocomposites). Currently, grain/seed hemp has a better rate of return than fiber but less than CBD. It has more stable risks and long term prospects than hemp fiber or CBD, but not the growth potential of either.

Assessing risks and opportunities in the hemp industry heavily depends on the outcome of the regulations and guidance USDA plans to release in the fall of 2019 as well as FDA's studies and regulatory framework. Despite the widespread presence of CBD in the market, it is not technically approved by the FDA for food, beverages, or dietary supplements. These risks will vary greatly based on individual circumstances. Some processors and a few lenders are willing to take on the risks in anticipation of huge revenues. Given the lack of available financing in the face of growing demand, some processors are paying huge risk premiums. The right financing arrangement can help foster the industry and take advantage of the short-term and perhaps longer-term market opportunities. ■

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⁶ Brezosky, Lynn. “Texas Farmers Ready for Catch-Up Mode in Global Hemp Race.” *San Antonio Express-News*. June 17, 2019. Retrieved July 2019 from <https://www.expressnews.com/business/local/article/Texas-farmers-ready-for-catchup-mode-in-global-14003074.php>

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