

**BEST PRACTICES FOR**  
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## FROM THE EDITOR



**Laura Drotleff**  
*Hemp Industry Daily*

Because the hemp industry is nascent, new and existing companies still need to develop consistent processes for handling the production flow of their goods and services, from their raw components to the end product.

Developing a stable framework helps companies efficiently control product quality, inventory levels, timing and expenses to quickly deliver high-quality, consistent products to the end user.

Since hemp was reintroduced to the U.S. as part of the pilot research program under the 2014 Farm Bill, a rudimentary supply chain has developed rapidly. However, because the industry has largely been focused on cannabinoid production, several areas remain nonexistent at worst, immature at best.

The fiber and grain segments of the hemp supply chain are just getting started. Many farmers have started to pivot toward these areas because the oversupplied and uncertain cannabinoid market is much less profitable than expected, but there is still much that remains unknown.

Many within the industry view the situation around the fiber market as a chicken-versus-egg scenario. Most farmers don't want to grow fiber varieties for a supply chain that doesn't exist, but processors are hesitant to sink money into a supply chain that can't exist without a fiber supply.

Meanwhile, processing in every segment has become a bottleneck. Because there were so many cannabinoid-focused companies that vertically integrated to control their own supply chain from seed to sale, there were not enough processors or extractors for stand-alone farmers, contributing to oversupply and driving down crop prices. Many farmers elected to process their 2019 crops just enough to put them in storage—holding on to last year's yield, despite having just taken off the 2020 hemp crop.

Processors, manufacturers and retailers have their own sets of struggles and bottlenecks, mostly tied to waiting on federal regulation from the U.S. Food and Drug Administration for postharvest hemp products. However, farmers' obstacles are felt all the way through the supply chain, and each link in the chain impacts the previous and following segments.

To help you understand the current issues affecting the hemp supply chain and the changes necessary for the industry to improve the flow of product from field to consumer, *Hemp Industry Daily* developed this report in collaboration with Hemp Industries Association, a nonprofit organization representing the many sectors within the industrial hemp industry.

In it, you'll find insights on:

- Input suppliers
- Farmers
- Processors
- Manufacturers
- Retailers
- Supply-chain disruption

This is only a step toward nailing down a framework for the market, and we expect there will be more to report on as the hemp supply chain continues to evolve. Meanwhile, we hope you'll use this as a guide to help you navigate the industry from start to finish, whether you're a novice or experienced in the market.

Please contact me with any questions or comments at [laura.drotleff@hempindustrydaily.com](mailto:laura.drotleff@hempindustrydaily.com).

A handwritten signature in black ink that reads "Laura Drotleff".

**Laura Drotleff**  
*Hemp Industry Daily*

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**Jody McGinness**  
*Executive Director,  
Hemp Industries  
Association*

## THE INDUSTRIAL HEMP SUPPLY CHAIN: PAST, PRESENT AND FUTURE

Hemp as a natural resource was deeply intertwined with the history of America. Before colonization, indigenous populations cultivated hemp to produce clothing, thread, paper, cordage and food. Farmers of the 17th and 18th centuries were at times legally required to grow hemp as a staple crop—at one point they could even pay their taxes with it.

As the nation expanded west in the 19th century, hemp did too, taking root in California, Illinois and Nebraska. Hemp exports, particularly those to England, thrived, and with the advent of the decorticator, the beginning of the 20th century saw a booming hemp market that some estimate to have been worth nearly \$1 billion. But because of the 1937 Marijuana Tax Act and subsequent restrictions, that early promise was never realized.

The plant experienced a major resurgence during World War II with the federal government's Hemp for Victory campaign, which included the distribution of more than 400,000 seeds. Strong industrial fibers were in high demand for war necessities such as cordage, rope and cloth after Japan cut off supplies of industrial hemp from the Philippines. As a result, farmers from Kentucky to Wisconsin produced 42,000 tons of hemp fiber annually from 1942 to 1946. But that resurgence lasted only as long as the war.

The story of the early days of the modern hemp industry in the U.S. is one of activists and idealists determined to realize the remarkable potential of hemp as an agricultural commodity but who were forced to navigate a perilous and byzantine regulatory environment in order to bring their products to market. With hemp farming illegal in the U.S. because of the wholesale prohibition on cannabis by the Controlled Substances Act of 1970, manufacturers in 1998 started turning to international sources to import hempseed, oil, and fiber. In 2001 and 2003, the U.S. Drug Enforcement Administration attempted to ban this workaround, threatening to destroy the fledgling hemp foods and personal-care industries. In response, the Hemp Industries Association and its allies mounted a legal challenge, and in 2004, a unanimous verdict in federal court established that the DEA lacked the authority to regulate sterilized hempseed, hempseed oil and hemp fiber.

Even after the 2014 Farm Bill, product seizures by the DEA, local law enforcement and the U.S. Postal Service continued to interrupt the exchange of hemp goods and prevent stability in the marketplace. In 2017, after a series of aggressive actions by the DEA, the HIA once again took that federal agency to court, winning a negotiated settlement in the hemp industry's favor. But it was not until the 2018 Farm Bill officially differentiated industrial hemp from its high-THC counterpart that a commercial, domestic hemp supply chain could officially start to rebuild in America.

### PRESENT

Today, the domestic industrial hemp supply chain is still taking shape, beset by bottlenecks and deficiencies. But, more than anything, it is hampered by a lack of clarity at the federal regulatory level.

The DEA continues to attempt to assert control over parts of the industry, despite the clear intent of Congress that hemp be treated as an agricultural commodity.

The 2019 crop year saw a glut of hemp grown for CBD—with disastrous results and impractical testing requirements and a lack of standardization dramatically increased risk for farmers.

Hemp grain needs significant investments in everything from silo construction to quality research in order to take root, while producers and buyers are still looking for a supply-and-demand balance that will make fiber production in the U.S. profitable at the industrial scale.

**FUTURE**

According to San Francisco-based Grand View Research, the global industrial hemp market size was approximately \$4.71 billion in 2019, a figure projected to triple by 2028. In the United States, industrial hemp sales (including grain, fiber and oil) reached roughly \$500 million—a fraction of where many believe it should be.

In order for the U.S. to take its rightful place as significant beneficiary of the global opportunity, the industrial hemp supply chain will have to mature along with the rest of the market, which will require significant improvements in, at least, these three areas:

**Research:** Large, long-term studies are required before hemp grain can gain access to the animal feed sector. Massive weather- and soil-data collection is needed to guide farmers to understand how they can profitably incorporate hemp into their rotations. Promising applications for hemp as a plastics or oil substitute need to be explored, as do its potential for bioremediation and carbon capture. The role of the federal government in directing research dollars will be critical to opening up the market for hemp and its derivative products.

**Exports:** China leads the world in hemp exports, mostly for textiles and fabrics. The push for energy efficiency is driving the adoption of hempcrete in Europe. Canada still supplies nearly all the hemp oil and hemp cake used for natural foods and self-care in the United States. Meanwhile, Colombia and India, among other countries, also want to become major players in the hemp economy. It is vital that international markets be fully opened to American hemp exports and that producers have the opportunity to compete fairly on the global stage.

**Stability:** Investment requires some confidence about what the future will hold. The existing patchwork of regulations governing hemp production, along with some of the impractical restrictions currently in place, do not provide such confidence. A more reasonable THC cap, testing requirements not inspired by the DEA, increased transparency throughout the supply chain and the adoption of universal standards and terminology for hemp in the U.S. are all necessary prerequisites to market maturation. ■

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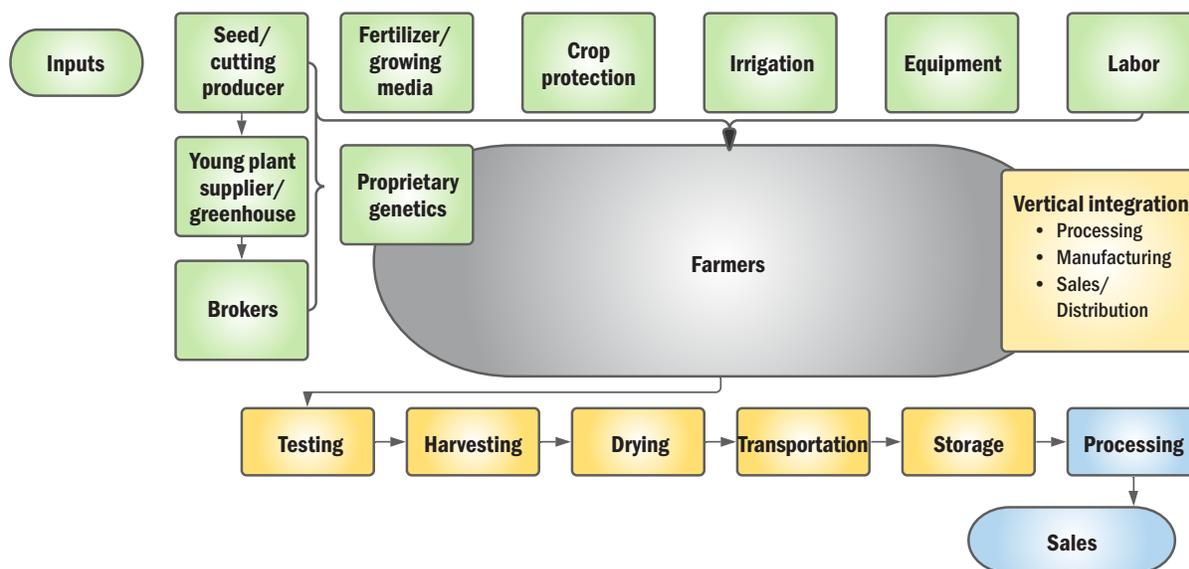


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## INPUT SUPPLIERS AND FARMERS

The hemp supply chain that produces cannabinoids, grain, seed, fiber and a host of derivative products ultimately begins with the hemp plant, the farmers who grow it and the tools and services needed to produce and harvest the crop. So it's imperative that farmers plan their crops accordingly, keeping in mind that their success and the resulting quality of their crops will impact the entire industry.



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In a nascent industry such as hemp, crop production hasn't become streamlined yet. There are different paths to production, including:

- Traditional farmers producing hemp as one of many crops.
- Specialized producers focused solely on hemp.
- Marijuana producers who have diversified into hemp production.
- Producers that have built some form of vertically integrated structure, taking the crop from seed to sale.

Vertically integrated companies and manufacturers also contract with farmers to produce hemp crops for them, though this model has been risky at best—and, in some cases, it has placed a large proportion of the risk on hemp farmers.

Hemp production itself is risky for several reasons, including:

- Lack of access to financing and crop insurance.
- Expensive crop inputs.
- A high learning curve for production and postharvest activities.
- Unsteady pricing for farmers' crops at harvest.

Add those to the uncertain federal regulatory framework that still exists, and it becomes clear why 2020 was the first year since the pilot hemp production program was established in 2014 that fewer U.S. acres were licensed for production.

## PLANNING

As a new industry, the only thing that has been consistent about planning production seasons is the lack of preparation. Hemp farmers have had to try to secure crop inputs at the last minute in many cases, scrambling for seed or liners (clones) all the way up to the start of planting season in June and July.

Ideally, planning should begin as soon as the last season ends, according to Mike Lewis of Kentucky-based Third Wave Farms.

“Your soil samples should have been taken in August so you have time to get cover crops in the ground, so you know what nutrient or mineral deficiencies you have, so you can address those,” he said.

This is how it often works in traditional agriculture. Greenhouse growers hit the big trade shows in the heat of summer after their spring seasons have wrapped up, with the most experienced placing orders as early as July and others wrapping up by November. Row crop growers place input orders for seed- and crop-protection products after their seasons end or just as they’re harvesting their crops in the fall.

Lewis said his outfit plans two to three seasons ahead, locking in seed orders to ensure availability.

Farmers can get a jump on the hemp season, Lewis said, by testing soil, considering labor needs for planting and harvest as well as sourcing inputs. Additionally, farmers should analyze their previous season, considering the performance of their hemp genetics, evaluating the pest and disease pressure that they experienced and developing a crop protection or integrated pest management (IPM) plan.

Farmers should also evaluate the business aspect of their operations, analyzing costs versus the anticipated prices they’ll receive for their crops. This gets tricky because of the volatility the industry has experienced over the past year. Prices bottomed out after the 2019 harvest because of an oversaturated market, a shortage of processors and the regulatory bottleneck for consumer use of CBD, which has thrown a kink into the development of the industry.

No matter what type of hemp that growers decide to plant, planning is the key to success, said Mark Reinders, CEO of Netherlands-based HempFlax and former president of the European Industrial Hemp Association.

“Do not plant hemp if you do not have a harvesting plan and if you do not have a contract at a processing facility,” Reinders said. “The total crop valuation only works if the whole infrastructure is in place. Start with your market and then work backward to the crop, but please do not plant any seeds without any planning because you will lose money.”



## KNOW THE COSTS

Too many farmers (of any crop) do not effectively keep track of their production costs—the dollar value of all inputs needed to grow the crop. Growing an acre of hemp would include inputs such as seed or clones, fertilizer, irrigation water, crop protection, machinery, labor and more. Each of these inputs has a dollar value, all of which add up to the crop's cost of production.

Knowing and understanding production costs is a prerequisite for determining a farm's performance, such as the yield per acre and its input value. This enables farmers to evaluate how efficiently resources are being used in farm operations to predict how the business will respond to specific changes and how to make useful decisions to achieve their goals. For example, if a hemp variety is not yielding enough per acre to pay for input costs, the farmer could evaluate changing genetics.

Estimating costs can be challenging. For example, assigning costs for raw materials or inputs for a particular time period, such as a growing season, is more straightforward than for ongoing and variable costs. Another category, imputed costs, can include fixed or ownership costs such as insurance, equipment depreciation and taxes.

The University of California, Davis created a [reference guide](#) to help estimate costs of production. For more direct guidance on particular operations and crops, farmers can contact their local extension office or the U.S. Department of Agriculture Farm Service Agency.



## FINANCING AND CROP INSURANCE

Until the 2018 Farm Bill separated hemp from marijuana and took it off the U.S. Drug Enforcement Administration's Controlled Substances list, farmers could not legally secure bank accounts or loans for hemp production. Crop insurance was also hard to come by because the U.S. Department of Agriculture's Risk Management Agency wouldn't provide it, and high-priced crop insurance was cost prohibitive. That left farmers to foot the bill for the high costs of hempseed and clones, as well as other inputs, without any kind of safety net. During the 2019 season, several farmers ended up losing more money when high costs outpaced profits—some even bet their entire farms on the expected returns. Despite lawmakers' efforts to help secure banking services, farmers lost bank accounts, crop insurance and even home insurance when institutions found out they were producing hemp.

When the USDA released its hemp production interim final rules, that dire situation began to change. Now farmers can secure loans and financing through the USDA's Farm Service Agency and federal crop insurance through Risk Management Agency. Further, federal banking and finance administrators have directed banks and credit unions to work with hemp farmers as they would any other business.

The U.S. Treasury Department's Financial Crimes Enforcement Network (FinCEN) said it expects banking institutions to monitor the transactions of hemp-related businesses as they would for other customers, following standard procedures and filing Suspicious Activity Reports (SARs) only if there are signs of questionable activity.

## SOURCING

Planning for a growing season means securing inputs from suppliers well ahead of time, ideally right after the previous harvest has ended. This allows the input suppliers more time to develop their own supply chain, based on sales rather than speculation.

Farmers should consider developing relationships with their suppliers, who not only can provide inputs but also offer technical support and services that make growers—and the entire supply chain more successful.

### SEEDS AND PLANTS

It takes 5-10 years to breed a new hemp variety and years after that to build up a seed supply for sexually propagated (seed) hemp varieties. This ramp-up process takes less time for asexually propagated (vegetative/clone) varieties, because producers can take cuttings from mother plants and literally clone those varieties.

According to Jenny Boyd, director of business development and supply chain with Colorado-based hemp plant breeder and seed provider New West Genetics, plant breeders have to build their output over multiple seasons. When a new variety is finally launched, it is typically released on a limited basis to a small number of farmers.

“The second year, you can ramp up faster. We could ramp up again next year, 10 times what we have today of (a new variety) if the market would demand it,” Boyd said.

Because of market uncertainty, there is only a certain amount of seed or cuttings (for liners or clones) that breeders will produce, so farmers need to plan early for the best chance at sourcing their genetics. Further, the earlier that hemp farmers begin to plan their seasons and order varieties with their suppliers, the greater chance they have to secure early order discounts, which is a model borrowed from the traditional agriculture and horticulture supply chains.

“Ideally, we would like to drive orders as early as possible, so we could start working together with the farmers and their agronomists and their other folks that they look to for expertise and make sure they can be successful,” Boyd said.

Growers can learn more about how to source reliable genetics through *Hemp Industry Daily's 2020 Variety Yearbook*.

### MACHINERY

Farmers looking to buy planting and harvesting equipment need to plan at least a year ahead, as the process for manufacturing and delivery of equipment can be long and arduous. Manufacturing of highly specialized hemp equipment is in the early development stages, with equipment engineers looking into the next iterations of machinery after learning more about the crop and its unique needs.

“This year is kind of a learning year, where we're finding out how the physiological differences and the dryness level of the plant makes a difference in how it behaves inside the combine,” said Beth Stukenholtz with FarmMax, a Nebraska-based hemp harvesting equipment manufacturer.

*Ideally, we would like to drive orders as early as possible, so we could start working together with the farmers and their agronomists and their other folks that they look to for expertise and make sure they can be successful.*

**Jenny Boyd**  
New West Genetics

The company sold three \$75,000 units in 2019 and hopes to produce more in 2020. However, based on parts sourcing and the cost of production, the price will likely increase, she said.

“An OEM (original equipment manufacturer) is going to take years to design and develop and test and then go back and design and develop and test and do that over the course of anywhere from five to 10 years before they even release anything to be sold to the public—and we’re accelerating that as much as we can to try to get this into the hands of the industry, because we know it’s going to be a huge benefit for the overall industry,” Stukenholtz said.

Lead times for manufacturing equipment are even more uncertain, considering that sourcing hydraulics and other parts has been difficult because of the economic and manufacturing delays caused by the coronavirus pandemic.

Reinders of HempFlax said farmers must understand that they can’t expect farm machinery to be delivered on time for harvest without pre-planning.

“The machine weighs 25 metric tons and it’s not something that I can send to the U.S. by DHL overnight express,” Reinders said, referencing a request he received from a U.S. grower who called to ask about sourcing a harvester two weeks before he needed it.

## LABOR

Many hemp farmers had difficulty finding labor to help with harvesting last fall, and industry insiders predict more growers will apply for agricultural guest worker programs to help fill the void. In the 2019 crop year, 63% of U.S. hemp harvesting was done exclusively by hand, according to *Hemp Industry Daily’s* 2020 Hemp and CBD Factbook.

Hemp farmers have yet to utilize agricultural guest worker programs on a significant basis to provide labor solutions for the labor-intensive crop. But the H-2 guest worker program has long been essential to industries within the United States, helping to boost the country’s economy and food security. The H-2A program provides agricultural workers, while the H-2B focuses on nonagricultural temporary workers.

Workers in the H-2 programs typically go through extensive interviews with the U.S. State Department. If accepted, they are permitted to enter the country to work temporarily or seasonally, but must return to their home countries after each labor season. But using guest workers isn’t cheap, and it can be difficult to keep up with all the bureaucracy involved, which is why many farmers use a professional service, agent or attorney to handle the applications. In addition to the H-2 programs, the TN visa program allows farms and businesses to hire educated and experienced Mexican and Canadian professionals for up to three years. TN visas are a good option for businesses seeking bilingual middle managers.

The H-2A program has grown exponentially since 2016, said Kerry Scott, program manager for guest worker consulting firm Mas Labor in Virginia. Businesses that both grow and process hemp can use H-2A workers for postharvest and processing jobs, a valuable option because current H-2B visa demand is about three times higher than supply.



Businesses that need H-2B workers in the fall should start the process the previous winter or spring, Scott said. For H-2A workers, farmers should contact guest worker consulting services at least 90 to 120 days before they want their workers to arrive.

## IRRIGATION

Determining how much water is needed for a hemp crop can require significant financial investment. Before buying irrigation systems, farmers might need to apply for permits, depending on state rules.

According to North Dakota State University's agricultural engineering department, the number of irrigated acres is usually less than dryland acreage, so irrigation must be integrated into the total farm enterprise. Irrigation also requires intensive crop management, including fertility, pest and weed control, timely identification of disease problems and, above all, accurate recordkeeping.

To develop a strong irrigation plan, farmers need to determine:

- Whether soils are irrigable.
- What quantity and quality of water is required.
- The availability of power and type of irrigation equipment needed.
- Whether irrigation is cost-effective for the farm enterprise.
- If financing is obtainable.
- How to select and manage irrigated crops, including scheduling.

Irrigation systems can work for up to 25-35 years, but they can cost as much as \$1,500 per acre. Farmers need to plan at least a season in advance to source and install a proper system for their crops.

Some hemp producers, especially in the West, fail before they begin because they don't account for irrigation through the entire season.

"If you go to plant and you're halfway through your season and you realize that you don't have enough water on your property, or your water rights only allow you to use X amount of gallons per year, you're going to be in trouble," said Kayla Haddix, a hemp consultant in Loveland, Colorado, and owner of Hippie Hempster, a line of topicals.

## CROP PROTECTION

During the 2010s, the agricultural use of beneficial insects and biological control agents ramped up significantly—especially among specialty-crop producers—as entire chemical classes were taken out of production and more pesticides were targeted. Glyphosate (the herbicide commonly known as Roundup), for example, is increasingly avoided because of potential effects on human health, while neonicotinoids have been implicated in the decline of pollinators such as bees.

Consumers increasingly are demanding sustainably and organically produced food—and the same applies in the cannabis space. So far, the U.S. Environmental Protection Agency has registered at least 10 pesticides for hemp production, nine of which are biological products approved by the Organic Materials Review Institute.

The use of sustainable and organic growing practices in hemp means that insectaries that produce beneficial insects and biological control agents such as predatory wasps have a tough time keeping up with demand. Insectaries require several weeks of lead time to rear the insects and ship them to producers. Biopesticides also take time to produce and, because of increased use by specialty crops farmers, demand is higher.

## POSTHARVEST

Farmers who produce traditional commodities such as corn or soybeans can deliver their crops to a grain elevator for storage until they can be sold on the commodities market. But farmers who produce hemp for cannabinoids don't have such a luxury. They must determine what the next step is for their crops.

Farmers' choices include:

- Securing a direct buyer.
- Preprocessing the crop themselves and contracting with a processor to finish the work for a toll or fee, then storing the finished product until it can be sold to a manufacturer.
- Investing in processing equipment and manufacturing a product for the end market.



*Photo courtesy of Victory Hemp*

On the fiber side of the market, the process is less clear, because fewer processors are equipped to accept the crops. However, farmers who produce hemp for fiber are finding that there more decorticators and processors are becoming available throughout the United States.

Hemp grain and seed producers have limited options, as well, according to Chad Rosen, founder of Kentucky-based Victory Hemp, a hemp grain producer and food manufacturer. More food manufacturers and consumer packaged goods brands are launching products that include hemp in their ingredient decks as hempseed ingredients increasingly resonate as nutrient-dense and healthy.

However, most processors are small and have demand filled by existing partners who expand their acreage—though they often are interested in engaging with new producers who can demonstrate proficiency from bringing in a good harvest.

“Producers who are keen to give it a go and who are involved in row crop agriculture, i.e. operate a seed drill, a combine, have grain bins and 50-100-plus acreage, should reach out directly to existing hemp food processors,” Rosen said.

Postharvest services and equipment needs must be set up before planting. Here are some key considerations.

## TESTING

Under the U.S. Department of Agriculture's interim final rules, farmers are required to inform state regulators when they plan to harvest their crops so the hemp can be tested within 15 days of harvest. This time frame might vary for states operating under pilot rules from the 2014 Farm Bill.

Every other industry that relies on chemical testing standards conducts some amount of routine in-house testing, according to Brian Smith, CEO and chief science officer of California-based hemp and cannabis testing analyzer manufacturer Big Sur Scientific. Hemp farmers should test their crops throughout the season to keep track of how the cannabinoid levels are developing so they know when crops need to be harvested to avoid exceeding THC levels, Smith said.

Hemp farmers must pay for their crops to be tested through third-party labs before harvest, when regulators sample and test their plants. Waiting until that point is irresponsible, Smith said, acknowledging that it's also expensive to constantly send samples to third-party labs to test crops when farmers can test more affordably in-house. Portable cannabis potency analyzers can cost up to \$25,000, according to Smith, but they can prevent an unusable crop—and disruption to the supply chain.

## DRYING

Drying the hemp crop after the harvest helps avoid mold and preserves the integrity of the crop's cannabinoids, terpenes, fiber, seed and grain. However, this step is often one of the most underestimated portions of the supply chain, according to Timothy Broderick, national sales and marketing director for IEC Thermo, an Illinois-based manufacturer of industrial hemp dryers.

Farmers should secure drying equipment or source drying services before they even buy their seeds and clones, he said.

“Have a business plan and, when buying genetics, make sure you have already talked to drying and extracting people—if you haven't done that, don't buy the genetics,” he said. “It's OK to miss a season, because the industry is only going to grow over time.”

Industrial dryers often work best for biomass material that has been combined, chopped and processed for oil extraction, Broderick said, but not so much for smokable flower products. Many farmers growing hemp for the flower tend to hang-dry crops in barns or, in the case of indoor producers, hand-harvest flower to dry on trays. However, the hang-dry method takes up space that most growers don't have and can backfire depending on the climate, temperature and level of humidity where farms are located.

New hemp farmers did not plan well the past two seasons for drying space or services, causing them to call processors or farmers with industrial dryers to ask for last-minute help—or even to contact dryer manufacturers to try to purchase machinery. This has led some groups to move away from vertical integration to specialize in toll-drying services. Farmer cooperatives are also investing in dryers.

Farmers and processors looking to invest in industrial dryers need a 16-20-week lead time at a minimum but should think as far ahead as possible. Projects often include local sourcing such as electricians and contractors, whose availability also needs to be factored in. And consider that it takes six months from dryer manufacturing to training.



***Industry data regarding the efficacy of different drying methods and its impact on cannabinoids, terpenes and other valuable parts of the hemp crop is in short supply. Hemp manufacturers are working on their own data, but industry researchers could provide additional clarity on this aspect of production with attention to different methods.***

## STORAGE

Hemp storage has become even more important over the past two years, with massive oversupply and corresponding rock-bottom prices in the 2019 season leading to farmers holding on to their crops with hopes of selling them later. But even as the 2020 season ended, farmers still had a surplus from 2019. Some growers chose not to produce this year as a result.

Until 2019, storage of hemp flower and whole-plant biomass had been relatively uncharted territory.

“This industry is so new that I don’t think anybody really knows how long this stuff will store yet,” said Scott Propheter, director of global cannabinoid extension and outreach at Pyxus International, a global agriculture company in North Carolina.

Hemp is susceptible to humidity, temperature, ultraviolet light and weather, so an improperly stored crop can quickly go from good to bad under the untrained eye. When exposed to the elements, some of the more common issues farmers and processors face with hemp include mold problems or degradation in cannabinoid potency.

Storage options can depend on the ability of the farmers to access processing. Storage options currently available include:

- Hang-drying and storing whole plants in tobacco or other barns.
- Bucking plants to take off flower and biomass and storing raw dried material in large sacks.
- Preprocessing dried hemp into pellets using a hammermill or pelletizer.
- Toll-processing hemp into winterized crude oil.



As more producers open for business, they likely will develop their own custom solutions that work best for their needs and customers.

Traditionally, industrial hemp has two main commercial uses: food and fiber. Each has distinctly different storage needs.

**Food:** Hemp grain storage is often kept on-farm. Canada requires hemp grain to be stored in clean, dry, aerated and locked bins. These can be similar to the steel bins used for corn, wheat and other crops. But unlike those grains, which are often heavily processed, hemp is served as a raw food, according to Russ Crawford, past president of the Canadian Hemp Trade Alliance.

It’s going to take some time for hemp grain production to reach the same point of other commodity producers; however, the grain-elevator model “would be a dream come true” for hemp food manufacturers such as Rosen.

**Fiber:** Similar to large, round bales used for storing hay as feed for animals, hemp bales can weigh up to 1,000 pounds and offer compact storage.

A former Kentucky-based natural fiber manufacturer said he received field-retted hemp straw in plastic-wrapped round bales from his contracted growers. Hemp straw must be baled dry, at a low moisture content of 12% or less, so it doesn’t mold in storage.

## TRANSPORTATION

Hemp is a heavy crop, which means transporting it can be costly. While many small-scale hemp farmers and agricultural producers have their own transportation infrastructure to ship crops directly to processing facilities, there can be advantages to working with professional transportation companies, according to Kevin Schultz, co-founder and president of 357 Co., an Illinois-based hemp logistics firm. .

To secure a logistics provider, Schultz recommends that farmers ask:

- Have they shipped hemp before?
- Do they have hemp-specific cargo insurance? Hemp is not standard on regular cargo insurance.
- Will the shipment be tracked via GPS?

Quotes can often be provided within an hour by some logistics companies, though additional time might be needed to ensure quote accuracy, especially if special equipment or logistics work is necessary.

In addition to asking the logistics provider about hemp-specific cargo insurance, growers should know their product's declared value and be able to provide backup information to prove the value.

Whether or not a grower works with a transportation company, in-transit hemp shipments need to include:

- Certificate of insurance and postharvest lab results to show legal total THC levels at or under 0.3%.
- Current grower's license from the state of origin of the product.
- Processor's license for the end destination (required by certain states).

The grower shipping hemp also must communicate ahead of time to:

- Ensure the receiving location is properly staffed and equipped to receive the load.
- Have a dedicated point person that will be at the location upon the driver's arrival and exit.
- Ensure that the point person can verify the bill of lading is correct regarding what was shipped and what was received.
- Have the point person sign off on the bill of lading.

# PROCESSING

Finding a qualified, highly credentialed extractor is an important step in the supply chain. The consequences of hiring a bad extractor can be devastating, leaving farmers with unusable crude or nothing.

But before going to a processor, farmers should have a plan for how they're going to harvest their hemp crops, as the different methods can impact the final result.

For example:

- Using a combine tends to lower the CBD potency. If you use a combine, do a couple of test runs to measure the effect.
- Hand-shucking or using a mechanical bucking process to try to get only the flower is labor intensive and expensive, but it could go a long way to maintaining high CBD potency, making the product more appealing to buyers.

Look for extractors with Current Good Manufacturing Practice certification (GMP) from the **U.S. Food and Drug Administration**. This shows the company is following high standards in inventory management and quality control, for example. It means they're constantly testing products for consistency and ensuring the facility complies with the Occupational Safety and Health Administration standards to keep employees safe.

In the absence of U.S Food and Drug Administration regulation, the Congressional Research Service's **CBD regulatory overview**, released in January, lays out a summary of FDA requirements for a variety of products that is a helpful start for manufacturers seeking to follow the agency's rules.

REQUIREMENTS	PHARMACEUTICAL DRUGS	FOODS AND FOOD ADDITIVES	DIETARY SUPPLEMENTS	COSMETIC PRODUCTS	TOBACCO PRODUCTS
<b>Example</b>	Epidiolex	CBD-infused honey	CBD oil	Body lotion	E-liquid
<b>Facility registration</b>	Yes [21 U.S.C. §360; 21 C.F.R. Part 207]	Yes [21 U.S.C. §350d; 21 C.F.R. Part 1 Subpart H]	Yes [21 U.S.C. §350d; 21 C.F.R. Part 1 Subpart H]	No	Yes [21 U.S.C. §387e]
<b>Product listing</b>	Yes [21 U.S.C. §360(j); 21 C.F.R. Part 207]	No	No	No	Yes [21 U.S.C. §387e(i)]
<b>Premarket review</b>	Yes [21 U.S.C. §355(a)]	No	No	No	Yes [21 U.S.C. §387j]
<b>Compliance with CGMPs</b>	Yes [21 U.S.C. §351(a)(2)(B); 21 C.F.R. Part 210 and 211]	Yes [21 U.S.C. §342(a); 21 C.F.R. Part 110]	Yes [21 U.S.C. §342(g); 21 C.F.R. Part 111]	No	Yes [21 U.S.C. §387f(e); regulations not promulgated yet]
<b>Adverse event reporting</b>	Yes [21 U.S.C. §355(k); 21 C.F.R. §314.80]	No	Yes [21 U.S.C. §379aa-1]	No	Yes [21 U.S.C. §387i(a)]
<b>Mandatory recall authority</b>	No (with the exception of controlled substances)	Yes [21 U.S.C. §350l]	Yes [21 U.S.C. §350l]	No	Yes [21 U.S.C. §387h(c)]
<b>Adulteration provisions</b>	21 U.S.C. §351	21 U.S.C. §342	21 U.S.C. §342; 21 U.S.C. §350b	21 U.S.C. §361	21 U.S.C. §387b
<b>Misbranding provisions</b>	21 U.S.C. §352	21 U.S.C. §343	21 U.S.C. §343	21 U.S.C. §362	21 U.S.C. §387c

Source: Congressional Research Service

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If you want to sell to big-box retailers or ship products internationally, make sure the processor also has certification from the International Organization for Standardization (ISO).

To earn and keep these certifications, companies must have their standard operating procedures well documented and administrative controls in place so every employee participates in the same training before they enter a lab or distribution setting, said Daniel Kohler, CEO of Hemp Synergistics, a Pennsylvania-based extraction company.

“It’s an ongoing process as well. It’s not one and done,” he said.

Biomass needs to be cleaned to remove seeds, stalks and large stems before extraction, but some companies, such as NeXtraction in Washington state, can process fresh hemp straight from the field.

Know what form your processor wants the biomass in before delivering it. Some extractors want milled or pelletized material; others want raw flower. Some extraction companies want to do the milling themselves so the process meets their standards, said Steven Turetsky, a cannabis consultant and founder and principal at The Yalla Group in Colorado.

Other biomass factors to be mindful of include:

- CBD potency. Extractors tend to look for biomass with more than 8% CBD, but 6%-8% is acceptable. Below 6% CBD requires more work to refine and more biomass to complete the process, Turetsky said. Higher potency makes the process easier and results in a higher-quality product.
- THC potency. To ensure compliance with U.S. Department of Agriculture rules, biomass can’t have more than 0.3% THC. If it’s higher, some companies will still complete the extraction process while lowering the THC.

Partnering with labs to co-market or co-brand CBD ingredients is a good way to ensure a buyer for the biomass. Kohler suggests developing a partnership immediately after deciding what will be grown.

Another way to work with processors is through a toll processing arrangement where the company keeps half the extracted CBD as payment from the farmer. Growers can also enter a tolling contract where they pay a processor a discounted fee per kilo and buy back the finished product.

Choosing an extraction method will determine the type of permits required. The four major extraction methods are:

- Hydrocarbon, which uses butane, propane or mixtures of other hydrocarbons.
- CO<sub>2</sub>.
- Ethanol.
- Water.

Some extraction methods are better for specific goals. CO<sub>2</sub> extraction is expensive, but the yields are higher quality, for example. However, CO<sub>2</sub> extraction might require winterization with ethanol to get a usable product. NeXtraction uses the water-extraction method because it can be certified organic when organic biomass is used.

Vertically integrated businesses that run their own extraction labs can acquire turnkey systems and closed-loop systems to handle the entire process.

As an extractor, partner with growers who can provide the type of certifications that instill confidence throughout the supply chain, such as organic or Good Agricultural Practices designation. Certify the potency of any biomass provided, even if the information has been supplied. NeXtraction splits the costs for heavy-metal and pesticide tests with growers, unless the grower can provide documentation that the tests have already been performed, said Nicole Foss, NeXtraction's vice president of research and formulation.

Extraction companies form a key part in the hemp product supply chain because they do business with both growers and brand owners. As an extractor, developing lasting relationships with buyers means knowing what their needs are and connecting them with the right biomass sellers.

A crucial aspect for a successful operation is understanding the role a business wants to play, for example serving as a supplier to small businesses or selling in bulk. Selling massive amounts of isolate, for example, can quickly create cash flow, but business margins are lower because the business is selling at quantity. Competition also can be fierce because wholesale buyers are always looking for the best deal.

Questions to ask when meeting with prospective buyers:

- Do they want a broad-spectrum, total-THC compliant product?
- Are they interested in acidic cannabinoids?
- Are they looking for minor, unique cannabinoids?

Growers are usually responsible for packaging the biomass and transporting it to an extractor, which means obtaining the proper permits from the relevant jurisdictions for transporting hemp. Things to consider:

- Does it make more sense to sell to a nearby extractor, which makes it easier to deliver product?
- If the extractor is in another market, additional permits in different states might be required.

Once oil is ready to sell, Foss said, extractors can work with buyers to advise them on proper dosing based on current research and to educate them about not making any false claims in their product labeling.

## FINAL TAKEAWAYS

Keep the supply chain running smoothly by having backup vendors in case something goes wrong—a natural disaster or product recall, for example. Vet vendors ahead of time to quickly fix a lapse in the supply chain. Consider:

- Background checks on management teams. Scrutinize their resumes and speak with former colleagues and peers.
- Inspections of vendor facilities and equipment. Note the year of manufacture, the make and model of equipment and the condition.
- Selecting vendors whose facilities and equipment have received Good Manufacturing Practice (GMP) and International Organization for Standardization (ISO) certification.
- Reviewing copies of licenses, certifications, compliance records, safety records, financial records and standard operating procedure manuals.



Photo courtesy of Victory Hemp

## THE BASICS OF RETAIL SUPPLY: THEN AND NOW

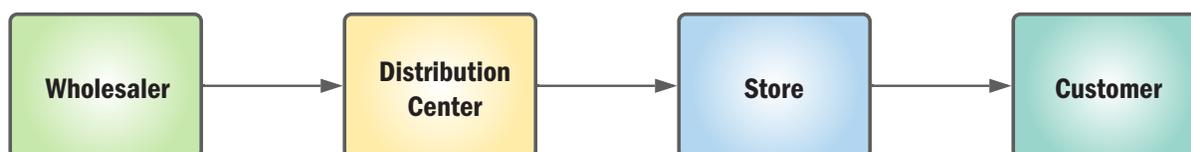
A traditional retail supply chain has four components:

- Wholesalers or vendors.
- Warehouses or distribution centers.
- Stores.
- Customers.

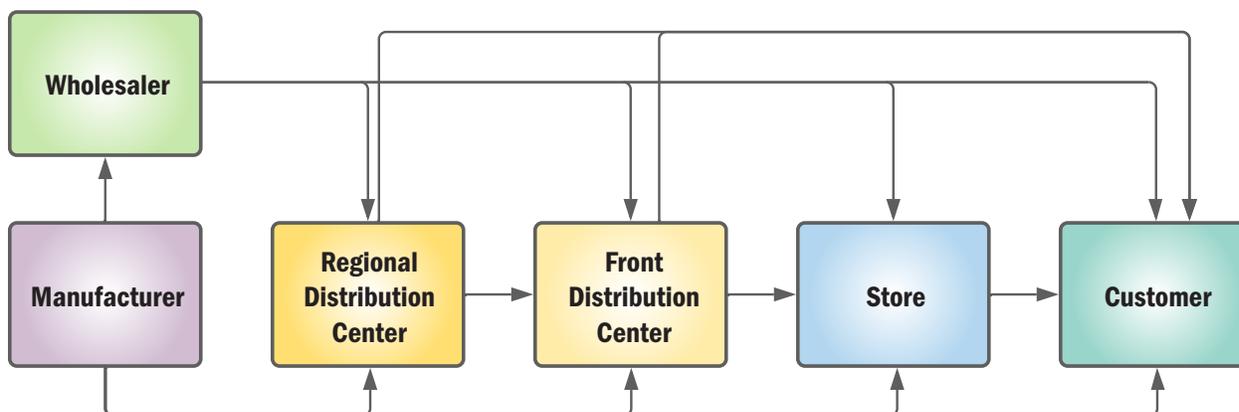
Traditionally, retailers haven't been concerned with manufacturers and their suppliers further up the supply chain.

Today's retail supply chain, however, is much more complex. Retailers are not only tasked with expanding their network of warehouses and stores, but they also have more options for acquiring products to meet consumer demand—namely via closer partnerships with manufacturers and raw-material suppliers to create store brands or private labels.

### Traditional retail supply chain



### Modern retail supply chain



Source: "Retail supply chain management: a review of theories and practices"  
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The versatility of the hemp plant and diversity of hemp-derived product offerings provides specialty retailers and those in the general consumer goods market with a wide range of options. It also means a wide range of considerations for managing the supply chain.

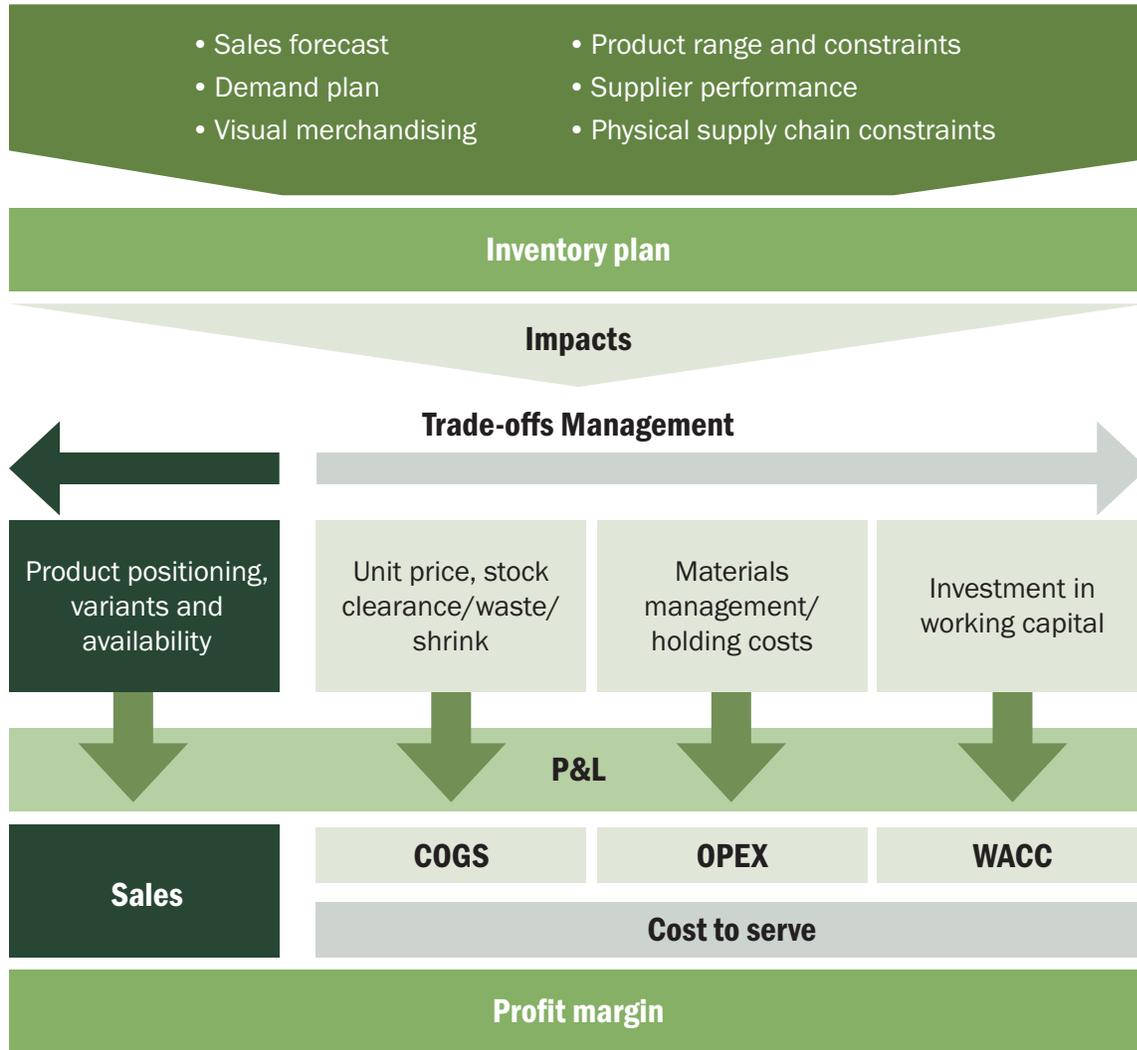
This includes determining the type of retail that is most appropriate for a product, which will provide direction to manufacturers and suppliers.

For example, conventional retailers tend to carry hemp-derived food products and supplements, while convenience stores focus on ingestible forms of CBD such as tinctures, gummies and beverages.

### INVENTORY PLANNING

Retailers need to consider a wide range of factors, both internal and external, when they plan and stock their inventories.

#### Role of inventory management in impacting a retail business' profitability



Source: PricewaterhouseCoopers  
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The most basic role of holding inventory is to help supply meet demand. To achieve this, a retailer must first understand what products its customer base is demanding.

Traditional retailers hold the majority of their inventory in distribution centers or in stores, so the ability to get product to where it needs to be when it needs to be there is a critical consideration.

When it comes to hemp-derived ingestibles containing cannabinoids, shelf life and potency are major inventory concerns for retailers. As a result, retailers might want to establish a more direct communication line to manufacturers to ensure the most complete and accurate information regarding the products.

## SOURCING

As retailers decide how to source the products on their shelves, the challenge of accurately evaluating product quality can loom large. Retailers face the burden of choosing the products they believe will appeal to their target customers, which can be a challenge in the saturated CBD market.

“Retailers are getting inundated with 3,000 companies plus who are trying to say, ‘Well, my product’s the best,’” said Annie Rouse, the Kentucky-based co-founder of CBD e-commerce platform Anavii Market and chief operating officer of hemp formulations company OP Innovates. “Well why is it the best? Are you manufacturing it in proper conditions? Are you getting the lab tests that you need? ... It comes down to the retailer being able to ask the right questions.”

A retailer that invests in sourcing quality products is also investing in customer loyalty, Rouse added.

“If you’re buying a product just based on margin, but ... it tastes bad or the functionality of the bottle or packaging is lacking, that customer is not going to come back and buy it again,” she said.

Suppliers should seek input from retailers when deciding how to formulate or package their products and provide samples or third-party reviews of their products. If the retailer is local, suppliers can offer to personally meet in person on store premises or invite potential buyers for a tour of the grow or manufacturing facilities.

## MERCHANDISING

Because the hemp and CBD industries are so new, retailers are still experimenting with merchandising displays and in-store placement.

The newness of the hemp industry also means that consumer misconceptions and confusion abound. The burden of consumer education often falls to the retailer, especially for those selling hemp-derived products.

“There are a lot of myths about cannabis science, how cannabis works or just overstatements that distort the things we have demonstrated scientifically or know to be accurate,” said Anna Symonds, a consumer educator at East Fork Cultivars in Oregon.

Symonds, who has visited stores across Oregon and hosted webinars to educate retail staff directly, is adamant that salespeople should be the focus of a CBD-education campaign.

Some ways that suppliers can help their retailers with education include:

- Arrange calls or visits with specialty retail staff to educate them on product formulation, function and intended uses.
- Incorporate QR codes, leaflets and graphics on product displays to address common questions.
- Work with retailers to understand their consumer demographics to target the educational materials more effectively.

In the absence of a highly trained sales associate, well-designed and strategically placed retail displays can serve a dual function: maximize a retailer’s sales while also setting one brand apart from the competition, according to Jim Hollen, the president of Rich Ltd., a point-of-purchase display and retail store fixture company in California.

## PRICES AND MARGINS

According to data from Nielsen Global Connect, consumers spend an average of \$75 per year on hemp-derived CBD products. However, many purchasers are still in the trial phase, which translates to a longer purchase cycle, especially for capsules, topicals and tinctures.

Hemp-CBD product prices are already compressing, driven by eroding prices for hemp biomass and plans to reach consumers with less disposable income in response to soaring unemployment numbers amid the coronavirus pandemic.

In April 2020, the aggregate price of hemp-CBD biomass plummeted to \$8.10 per pound—a drop of 79% compared with \$38 per pound one year earlier, according to pricing and tracking agency Hemp Benchmarks in Connecticut.

The falling CBD prices show up in direct sales faster than through mass-market retailers, according to Nielsen. Tracking prices for roughly 2,500 CBD products in food, convenience and drugstores revealed an average product price of \$20.69 in a four-week period ending June 13.

Retailers have lower margins than do CBD manufacturers that sell directly to consumers. This means they have less flexibility to reduce their prices when inputs up the supply chain become cheaper. Brands that heavily discount their products when selling directly to consumers on their own e-commerce sites will ultimately be less attractive for a retailer to carry.

## COVID-19 EFFECT ON RETAIL

The coronavirus pandemic has forced retailers to recalibrate their priorities. According to analysis from New York-based global management consulting firm **McKinsey & Co.**, demand for nondiscretionary goods have ramped up and companies have had to meet the surge in demand while also prioritizing employee health and well-being across the supply chain.

The hemp industry, particularly manufacturers of CBD products, largely produce discretionary products. This means conventional retailers are more likely to move the products down the priority list when it comes to inventory management and merchandising during a prolonged health crisis or major disruption.

“Typical merchandising behavior doesn’t happen anymore,” said Oliver Horn, CEO of Australian CBD maker Elixinol Global. “It feels almost like it’s a time capsule. It’s like a frozen market where there’s no new products being put on the shelves and stockholding is reduced.”

Specialty stores and exclusive sellers of hemp-derived products are among the retailers that have had to redeploy resources to support online orders or reduce business activities to compensate for the drop in demand.

**COVID-19 has made things pretty wacky. Being an e-commerce company, we had a spike in sales when everything shut down (due to the coronavirus outbreak), but we’re learning that CBD is not recession-proof. It’s more of a luxury good than a commodity.**

**Annie Rouse**

Co-founder of CBD e-commerce platform Anavii Market and chief operating officer of hemp formulations company OP Innovates

Supply-chain disruptions have been a hallmark of the coronavirus-hit global economy, and **Advanced Supply Chain Group** has identified five major trends that retailers have adopted to survive in the post-COVID era:

- Reviewing lead times.
- Localizing stock.
- Balancing stock flow/accurate inventory management.
- Auditing stock to improve profitability.
- Creating contingency plans (increase number of suppliers, working with more logistics providers) to avoid disruption.

Retail suppliers should find ways to be part of these conversations to strengthen the relationships.

## E-COMMERCE

According to a survey conducted by Chicago-based High Yield Insights in September and October of this year, CBD users report that the pandemic has changed their shopping behaviors. At least half of all respondents said they:

- Do more shopping online (56%).
- Reduced browsing in store (50%).
- Reduced the number of stores where they shop (59%).

“That pertains to shopping in general but has obvious implications as to how willing CBD users are to making special trips rather than consolidating shopping trips to a much smaller list of stores,” High Yield Insights President and co-founder Mike Luce said.

With less foot traffic in stores, retailers have been forced to confront their e-commerce capabilities as consumers adjust to spending less time in stores and more time at online or on their mobile phones.

The shift toward online sales began long before the global pandemic, however, and is forecast to ramp up over the next decade. According to California-based Grand View Research, the global e-commerce market is expected to grow at a compound annual growth rate (CAGR) of 14.7% from 2020 to 2027.

“The pandemic has accelerated the altering of buying patterns, and I believe it’s done that for good,” said Georgia-based Diego Pantoja-Navajas, vice president of WMS development at Oracle and former founder and CEO of LogFire.

“I don’t have any reason to believe that online shopping will suddenly slow down over the coming months. In fact, what I have seen and helped implement with many customers this year is the combination of the digital and the physical. Companies don’t want to lose their physical space completely. They may want to reduce footprints, but they know it’s good to have a physical presence in markets where they expect to have growth.

“The important thing here is that companies are giving customers the option to decide if they want to go to stores or stay in the safety of their homes to complete their shopping. This is the critical requirement in meeting the challenges of Year One of the new world,” he said.

## DOES YOUR BUSINESS NEED BLOCKCHAIN?

Gaining the trust of customers and supply-chain partners is paramount in any new industry, and the hemp space is no different. As CBD products flood the market, being able to show where something originated and what ingredients are included is one way to stand out from the crowd.

Blockchain isn't just for cryptocurrency anymore. With blockchain, businesses can enter records, transactions and other information on digital "blocks" stored in a network of computers without a central authority controlling the data. The records become part of a digital ledger that can include accounting data, cultivation information, certificates of analysis, certifications and other important documents.

One of the appeals of blockchain is that once a block is created, it cannot be modified because it exists in a network and every node in the network would have to agree to make a change. That means supply-chain partners can see where a product was sourced, for example. Customers also could access that information by using a smartphone to scan a QR code on a product.

"We're taking in biomass from farms, and we're putting it into nutraceuticals cosmetics and perhaps even biopharmaceuticals. And, to me, that needs the responsibility that comes with blockchain and the security that it provides," said Nicole Foss, vice president of research and formulation at NeXtraction, an extractor in Washington state.



*We're taking in biomass from farms, and we're putting it into nutraceuticals cosmetics and perhaps even biopharmaceuticals. And, to me, that needs the responsibility that comes with blockchain and the security that it provides.*

**Nicole Foss**

*Vice president of research and formulation at NeXtraction*

# DISASTER-PROOFING YOUR SUPPLY CHAIN: STRATEGIES FOR SURVIVAL

There are lessons worth remembering from the COVID-19 pandemic and the unprecedented wildfires and hurricanes that disrupted businesses in 2020. And those lessons will serve the hemp industry well into the future when unexpected events again disrupt supply chains, as they inevitably will.

In many ways, the hemp industry suffered the same supply-chain disruptions seen in other industries. According to **Accenture**, a multinational professional services company based in Ireland, roughly 94% of Fortune 1000 companies saw supply-chain disruptions from COVID-19 and 75% of Fortune 1000 companies reported negative or strongly negative impacts on their businesses.

Companies in all industries experienced seismic changes to supply chains, consumer behavior and the route to market. Those changes spelled doom for many businesses without the agility to outmaneuver uncertainty.

But the market rewards operators who show resiliency and responsibility.

## START WITH RESPONSIBILITY

The first step in planning for disastrous supply-chain disruptions boils down to three words that must be front of mind if your business is to survive and thrive past the crisis: Put people first.

That's a critical consideration. Your plan will be executed by a staff that is going to need your help to maintain productivity and give them alternative ways of working. Customers and suppliers need to know how your business model accounts for the disaster and that you can still deliver goods and services through the disruption. Shareholders and investors want to see responsible interventions that minimize unnecessary spending and preserve cash for future growth.

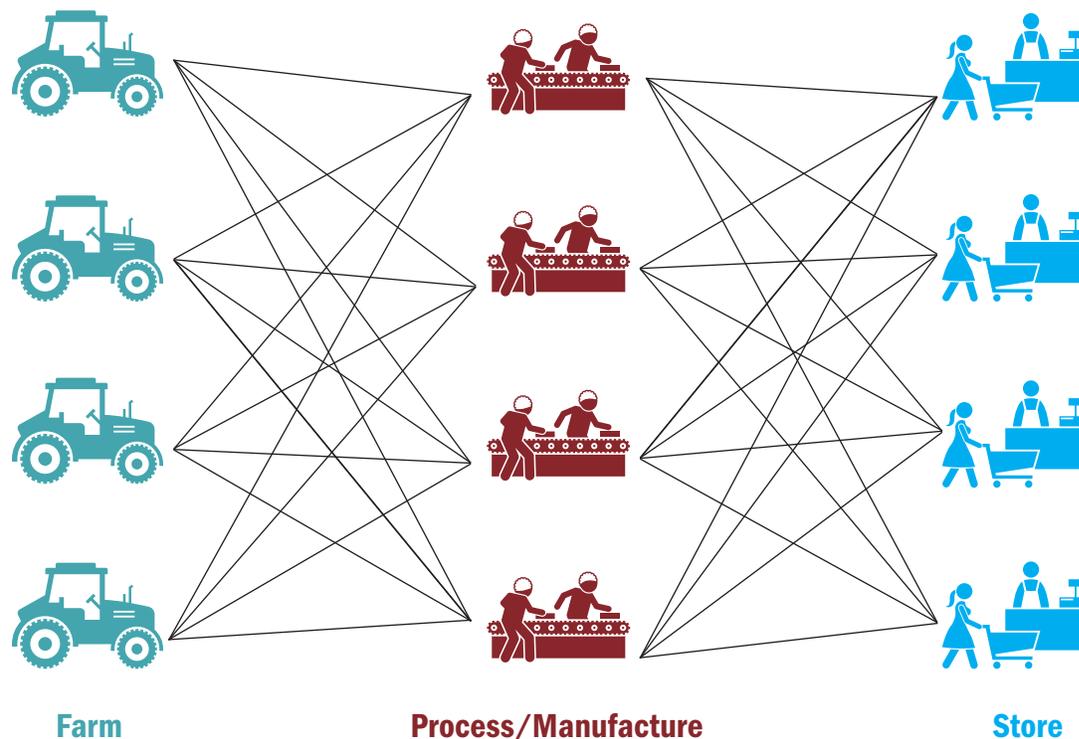
That means each step of your supply-chain disruption planning must start by answering six key questions:

- How will you support new ways of working if your employees are unable to come to an office or are forced to evacuate their homes?
- Who is your dedicated "first responder" team to identify supply-chain disruptions and investigate alternatives?
- How will you address the physical and mental well-being of your team? (Don't forget to include yourself as part of the team!)
- What resources can you tap to assist team members in crisis?
- How will you communicate supply-chain changes to on-site and remote workers, suppliers, carriers and investors?
- What do your customers need from you during this crisis or supply-chain disruption?

People represent both the first step and the foundation of every part of your plan for supply-chain disruptions. Keeping these six questions front of mind as you navigate inevitable business interruptions will position you for continued success after the crisis passes.

## CONSIDER YOUR SECTOR

The next step before building a plan to adapt to supply-chain disruptions is to consider your place in the overall hemp supply chain and what changes might be specific to your sector.



### Considerations for farmers:

- **Only three in 10 workers** in the U.S. agricultural workforce are born in or are citizens of the United States. How reliant are you on foreign-born labor, and how would your operations be affected if travel or visas are affected?
- Which other crops could you grow if the supply of input seeds or clones were disrupted?
- What is your strategy for harvesting and storage if your downstream buyers fail?

### Considerations for manufacturers:

- Where does your equipment come from? How would you service or replace it if your equipment supplier fails or is forced to close?
- Could you sell your products directly to consumers in case of retail disruptions?
- Do you have space to store “safety stock” in case you encounter OR experience an upstream supply-chain disruption or a workforce crisis causes you to pause production?

### Considerations for retailers:

- How would you serve consumers if they couldn't visit a store? How quickly could you pivot to e-commerce sales channels?
- Do you have spare inventory in case of unexpected demand surges? Or a storage plan in case of unexpected drops in demand?
- How would you communicate declines in on-time in-full delivery performance to your key customers?

## CIRCLE OF EXECUTION

After prioritizing the people you work with and for and considering the special supply-chain pressure points for your sector of the hemp industry, it's time to start drawing up a plan for responding to business disruptions such as natural disasters or health emergencies.

Imagine your supply-chain disruption response plan as a wheel:

- Your plan should start with a “trigger” to mobilize a response. The trigger might be obvious, such as a natural disaster right outside your business. But don't stop there. Your strategy mapping might need to account for supply-chain interruptions many time zones away. A thorough mapping of all your upstream suppliers and downstream customers will help your business respond quickly to supply-chain disruptions and give you the best chance to overcome them.
- After your mobilization plan is triggered, your first responders need to identify gaps in your supply chain and prioritize them. Encourage your first responders to identify alternatives or suggest solutions for working around the problems.
- Next, it is time to execute your workarounds. This might mean shifting suppliers to a country or region not experiencing interruptions. It might be finding storage for hemp biomass you can't sell. It also might be identifying business lines you'll need to close.
- Finally, evaluate your workarounds. What is working? What glitches have now appeared as you execute your plan? How is your cash flow?

Just like a wheel needs firm ground to keep rolling, make sure your company's is underpinned by a constant consideration of the people it employs as well as suppliers, clients and investors.

Don't put off planning for supply-chain disruptions. The interruptions of 2020 might have been unprecedented, but no organization in business for any length of time has failed to encounter a supply-chain disruption. Resiliency through the unexpected comes from having an action plan that can be updated throughout the years with the latest technology to keep your business open and thriving when interruptions occur.



## CASE STUDY: GREEN LION COMPLIANCE

Hemp's often-murky legal status makes it tougher to count on a supply chain during disasters.

That's a lesson hemp operators learned the hard way in 2020, according to Karen Tobin, CEO of Green Lion Compliance in Rochester, New York.

Tobin, who counsels hemp businesses, says her clients didn't know whether they needed to close when pandemic shutdowns began. Agriculture was deemed essential, but what about processing an agricultural product into something other than food?

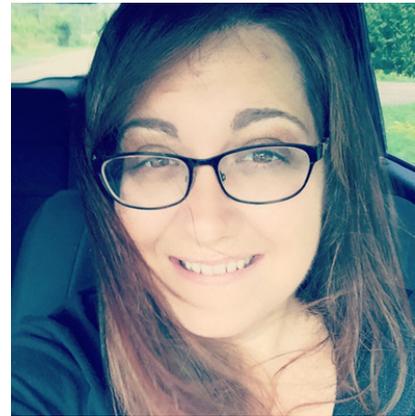
"Hemp, post-cultivation, is in a very gray legal area," she said.

Pile on top of that the patchwork of state regulations that govern everything in cannabis—both hemp and marijuana—and new hemp business found themselves with little direction.

Tobin said hemp businesses must consider not only what to do during a supply-chain disruption but also what they're allowed to do. Only after making sure they can stay open can they begin addressing the disruption.

Regardless of tomorrow's legal landscape, Tobin suggested two strategies for hemp companies to deploy now to prepare for future business interruptions:

- Have a good communication plan with vendors and clients. "Being honest, communicating with them on the struggles that you're encountering, I think, is No. 1. And then you start setting up a plan that will work for both parties, whatever that relationship is within the supply chain."
- Keep enough inventory and equipment to function for 90 days. "You should have some stockpile in place, always. You should have disaster-recovery and business-continuity plans in place. And within that is what we like to call a 'war chest'—general supplies all the way down to replacement pieces of equipment."



Karen Tobin, CEO of Green Lion Compliance