



Hemp plants are bred to grow as single, long stalks to facilitate processing into fiber and other valuable products. Processing branched stalks, which are typically found on medical cannabis plants, is much more difficult.

CONSUMER SAFETY

US hemp boom creates chaos

Companies struggle with varying state laws, lack of federal guidance

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In just 5 years, industrial hemp in the US went from small-scale research programs at a handful of universities to commercial crops growing in more than 40 states. But government regulation hasn't kept up. Rules dictating what steps hemp growers and processors must take to market their products differ from one state to another, and federal guidance won't be in place until at least next year. The result is an industry that is swirling in uncertainty and chaos as it tries to meet surging demand for its products.

The Hemp Industries Association (HIA), a trade group for the hemp industry, is pushing for federal regulations that would offer consistency across the US. The group doesn't want a patchwork of different state standards, says Joy Beckerman, HIA president and principal of the consulting firm Hemp Ace International. "We believe in states' rights, but we've got to get national standardization for hemp testing and labeling requirements," she says.

Beckerman also serves as regulatory officer and industry liaison for Elixinol, a hemp-extract company that operates in 43 countries. She worries about small businesses that may not be able to afford to pay a regulatory officer like herself to navigate the "ever-changing and open-to-interpretation"

state hemp rules. It is "burdensome and costly for them to even keep track of what the requirements are," she says.

The 2014 farm bill kick-started US hemp production after decades of prohibition by allowing states to establish pilot programs for hemp cultivation and commercialization. In 2016, growers planted hemp on nearly 10,000 acres (4,000 hectares) in the US. That number skyrocketed to more than 78,000 acres (31,500 hectares) in 2018, according to Vote Hemp, an advocacy group. The latest version of the farm bill, enacted in December 2018, removed hemp from the Controlled Substances Act, opening the door for rapid expansion of the industry.

Hemp is part of the cannabis family. But unlike medical cannabis, it does not contain sufficient tetrahydrocannabinol (THC) to produce a high. Much of the recent demand for hemp is being driven by the growing popularity of another chemical found in cannabis plants—cannabidiol (CBD).

CBD won't get you high, but anecdotally, people say it helps reduce pain and anxiety. Dietary supplements containing CBD are widely available in the US as tinctures, topicals, capsules, vape oil, gummies, and other products. Dozens of states also allow hemp-derived CBD in cosmetics, personal care products, beverages, food,

and pet food. In 2017, CBD-containing products made up \$190 million, or 23%, of the \$820 million hemp goods market in the US, Beckerman says. No market data are available yet for 2018, she says.

CBD aside, hemp's high-strength fibers and nutrient-dense seeds can be turned into paper, textiles, building materials, biocomposites, bioplastics, industrial sealants and coatings, and numerous other products, Beckerman says. The plant grows quickly and remediates soil, extracting heavy metals and improving the ability of soil to sequester carbon dioxide, she adds.

The Canadian Hemp Farmers Alliance touts hemp's potential to reduce global CO₂ emissions, both by replacing petroleum as a raw material for various products and through soil remediation, Dan Carter, the group's CEO, told US Department of Agriculture officials at a meeting in March.

The 2018 US farm bill directs the USDA to establish rules for hemp growers. The hemp industry is eager for these regulations, but they won't be ready until later this year. The USDA intends to issue the rules in time for the 2020 growing season.

Groups like the HIA are working closely with USDA officials to develop the rules. Many states do not require testing of hemp beyond showing that it contains less than 0.3% THC—the limit for THC in hemp as defined by the farm bill. Hemp, however, accumulates heavy metals like lead, cadmium, mercury, and arsenic from soil. That is a benefit when you are trying to remediate contaminated soil, but it is problematic if

the plants are intended for the CBD market.

“We are going to be pushing for stringent testing” for contaminants like heavy metals, mycotoxins, and pesticides, Beckerman says. Testing is especially important when hemp is used as a source of CBD for dietary supplements, food, and cosmetics, she says. Beckerman points to the US Hemp Authority’s certification program, a voluntary effort that created the first certified good agricultural practices and good manufacturing practices for the US hemp industry. The effort was seed funded by the US Hemp Roundtable, the HIA’s advocacy partner.

The 2018 farm bill also legalized transporting hemp and hemp-derived products across state lines. Even so, a few US states don’t want anything to do with the plant and are interfering with shipping. In one high-profile case, law enforcement in Idaho confiscated a legal shipment of hemp making its way from Oregon to Colorado. The owners of the hemp sued, and a federal judge ruled that Idaho does not have to give back the crop. The case is being appealed to the Ninth Circuit Court of Appeals. “That will be the first real test” of the farm bill’s hemp provisions, Beckerman says. The US Hemp Roundtable wrote an amicus brief siding with the hemp owners in the appeals case, she notes.

In comments to the USDA during the March public meeting, the elected chair of the National Hemp Association, Geoff Whaling, urged the agency to “provide educational programs for law enforcement and other stakeholder groups so that they are aware that hemp is now recognized as a commodity crop and that issues such as interstate commerce are allowed.”

In addition to transportation issues, the hemp industry is struggling with companies that still associate hemp with illicit cannabis or medical cannabis. For example, social media sites like Facebook have blocked manufacturers from advertising hemp products. Banking and merchant processing “are also a nightmare,” Beckerman says, as several companies refuse to do business with hemp companies.

And then there is a lack of infrastructure required to turn hemp into valuable products. “But that is also an opportunity,” Beckerman says. Tens of millions of dollars’ worth of equipment is needed to process that long, strong, valuable stalk, she notes.

China and Europe are much more advanced than the US in terms of hemp-processing infrastructure. China is the “master of textiles,” Beckerman says, and supplies most of the hemp textiles in the US. The recent trade war between the US and China threatens US businesses that rely



Hemp-derived CBD supplements are growing in popularity, but the legal landscape in the US remains murky.

widely used for fiber, building materials, and plastics, Beckerman says. Canada has been regulating hemp since 1998 and “very quickly made itself the world’s leader in bulk hemp food ingredients,” she notes.

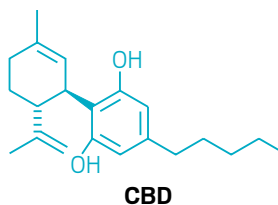
In the US, the demand for CBD is giving the hemp industry a huge boost. But the legal landscape for CBD products is even murkier than that for growing and transporting hemp. Although hemp-derived CBD is legal under many state laws, the US Food and Drug Administration has federal authority to regulate the compound in food, dietary supplements, cosmetics, and other products under the agency’s jurisdiction. The FDA considers CBD to be an active pharmaceutical ingredient in an approved drug. Adding such active pharmaceutical ingredients to any food or dietary supplements is illegal under federal law.

Nevertheless, the FDA so far has taken limited action to address the confusing legal status for products that contain CBD. The agency has cracked down only on companies marketing CBD products with therapeutic claims.

The FDA has established a task force to explore federal regulatory options for products that contain compounds derived from cannabis, including hemp. The agency held a public meeting on May 31 to learn more about issues related to product safety, quality, marketing, and labeling of CBD in food, dietary supplements, cosmetics, and other products regulated by

on hemp textiles, she says. Building up the US hemp industry would help mitigate import tariffs, which just increased to 25%.

In Europe, hemp is



the FDA. It is unclear, however, when the FDA will issue any regulations.

The quality of CBD products is highly variable, in both the US and Europe, according to recent reports. “When you are dealing with a hypergrowth industry, you see compromises, and corners are cut,” says Tami Wahl, a Washington, DC-based attorney and lobbyist with clients in the CBD market. “From a consumer perspective, really know your brand,” she warns.

In a study published in 2017, US researchers tested 84 CBD products, including oils, alcohol tinctures, and vaping liquids, purchased online in 2016 (*JAMA, J. Am. Med. Assoc.* 2017, DOI: 10.1001/jama.2017.11909). The CBD concentration on the label was accurate for only 31%

of the products tested, while 26% of the products contained less CBD than declared and 43% contained more, the researchers reported. Of all the product types, vaping liquids were the most frequently mislabeled.

Last year, researchers in Italy reported similar results for CBD oils purchased in European countries (*Molecules* 2018, DOI: 10.3390/molecules23051230). The scientists found that 9 of 14 products had inaccurate CBD concentrations on their labels.

Scientists have also found unlabeled, potentially harmful psychoactive ingredients in CBD products. Last year, researchers at Virginia Commonwealth University reported finding the synthetic cannabinoid known as 5-fluoro MDMB-PINACA, or 5F-ADB, in four CBD vaping liquids. 5F-ADB is associated with intoxication and overdoses. The researchers also found the cough suppressant dextromethorphan in another CBD vaping liquid (*Forensic Sci. Intl.* 2018, DOI: 10.1016/j.forsciint.2018.10.019).

Hemp industry supporters are not optimistic that the FDA will issue rules related

to hemp-derived CBD anytime soon. “It could take 2 to 3 years, if we are lucky, for the FDA to put any type of regulations in place,” Beckerman says.

While the industry and consumers wait, “hopefully the reputable companies will be able to preserve the market space,” Wahl says. “A lot of players that are using CBD in their products are trying to do it the right way,” she notes. Under its voluntary program, the US Hemp Authority has certified more than a dozen companies making CBD products. In general, certification aims to ensure that products contain quality CBD, are not contaminated with impurities, and are accurately labeled.

The US hemp industry is hoping that Congress will step in and pass legislation to fix the confusing legal situation related to CBD products. Congress could give the FDA a deadline to establish rules or declare CBD a legal ingredient in food and dietary supplements. Lawmakers could also set a threshold concentration for CBD in food and dietary supplements, above which the FDA would regulate the compound as a drug. It is unclear what direction lawmakers will take, but Senate Majority Leader Mitch McConnell (R-KY) supports boosting the hemp industry in his home state.

In the meantime, groups are spring-

US hemp industry by the numbers

31,500

Hectares of hemp planted in the US in 2018, up from nearly 4,000 hectares in 2016

\$820 million

US sales of hemp products in 2017, of which \$190 million was hemp-derived CBD products

Source: Hemp Ace International.

ing up to help educate consumers about cannabis and hemp products. “With the cannabis, hemp, and CBD sectors in the US now booming, consumers are more confused than ever by the flood of products hitting the market,” Toni Ioppolo, CEO of the Cannabis Consumer Institute, says in a statement. The group is holding a symposium on June 5 at the University of Colorado, Boulder, to educate consumers “so they can consume with confidence and know that the products they are using

are safe, quality” cannabis goods, Ioppolo says.

Hemp advocates are hoping to shine more light on the benefits of hemp across all product categories. CBD is a major factor driving the growth of the US hemp industry, Beckerman says, “but the larger factors are the need for a renewable, fast-growing, less expensive, less toxic resource to make tens of thousands of products that are better performing, more durable, and healthier.” ■



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