
Hope for Hemp? A Misunderstood Plant Prepares for its Comeback

By Rona Kobell

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A B E L L
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F O U N D A T I O N
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Hope for Hemp? A Misunderstood Plant Prepares for its Comeback

by Rona Kobell

Introduction

What if we discovered a plant that grew quickly and in multiple climates, could be used to make everything from textiles to medicine to fuel, required less fertilizer than corn and less water than cotton, and could be more valuable to a farmer's bottom line than most commodity crops?

The truth is, we already have such a plant. In Colonial days, farmers grew it and processed it to make paper, outrig ships, braid ropes, sew clothing, and manufacture canvas sacks. Even the first American flag, sewn by Betsy Ross, was made from it.¹ In Asia, the plant's uses reach back even further, at least as far as 6,000 B.C.

The plant is hemp. And for close to a century, it has been illegal to grow in the United States of America.

Hemp comes from cannabis, like marijuana, but it won't get anyone high. Although hemp has many different varieties with different chemical concentrations, all are low in THC, the active ingredient in marijuana, and none contain psychoactive properties.

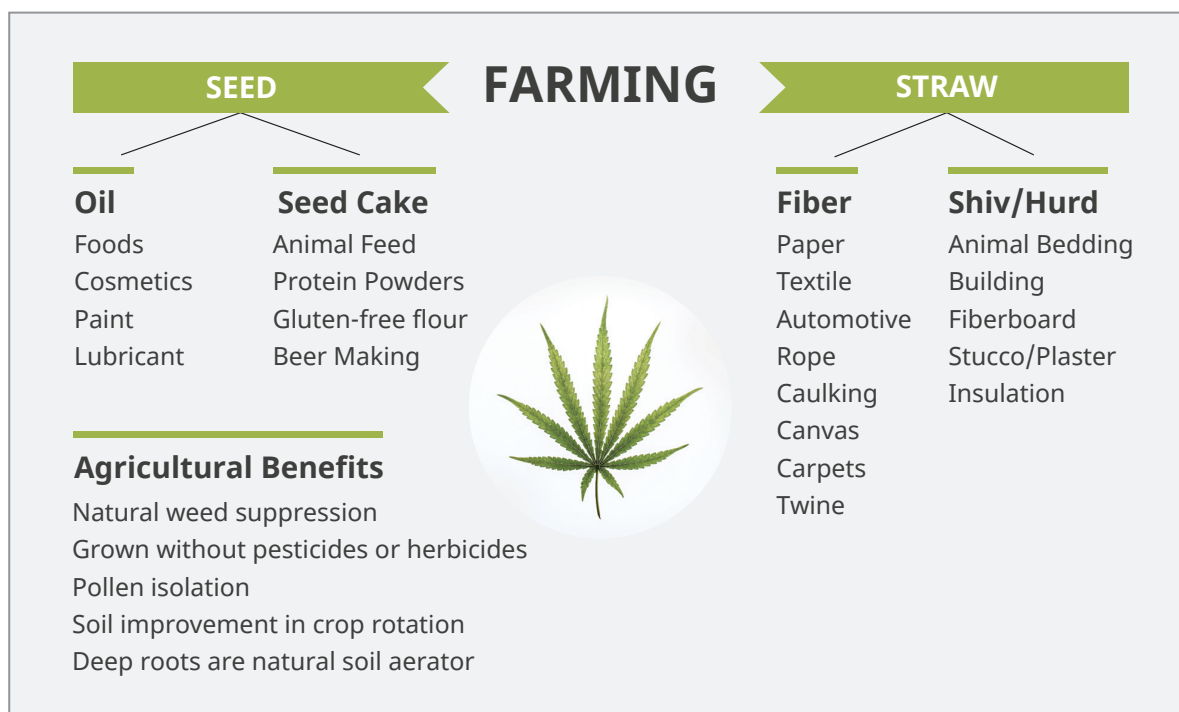
Instead of a mind-altering state, hemp produces thousands of valuable products. Among them: medicines that heal wounds, temper chronic pain and nausea, reduce seizures in epileptics, and supplement nutrition; high-quality fibers that can be spun into dresses or tops; hurds that become insulation for airline seats and homes; oils and seeds to improve digestion; and fuel to power farm equipment, vehicles, and homes.²

Despite its usefulness, hemp became nearly impossible to grow legally after 1937, when Congress passed the Marihuana Tax Act.³ (It originally had an H, but was replaced with a J soon after in common spelling.) As a result, cotton took the place of hemp in textile manufacturing. Trees came down to turn wood pulp into paper. Companies manufactured chemicals, many of them toxic, to dye cotton clothes, insulate homes, and protect textiles from fire. And tobacco, already more commonly used than marijuana in the general population, became the ingredient of choice in pipes and cigarettes.

Now, as various states decriminalize medical marijuana, some are also tugging at the proverbial hemp rope. Interest goes beyond an endeavor to find all-natural oils or soaps for personal use; states see great potential in being early to enter a growing industry.

As of 2015, annual worldwide sales of hemp products were around \$580 million, with hemp seeds driving this growth. France produces 70 percent of the hemp for the worldwide market, China about a quarter. The U.K. made hemp production legal in the 1990s and found a solid market. Canada only legalized the industrial production of hemp in 1988 and began issuing licenses in 1994. By 2014, it had exported \$48 million worth of hemp products.⁴

Recognizing the promise of a plant that is still classified federally as a controlled substance, states are taking matters into their own hands. In 2014, the U.S. Department of Agriculture authorized state agriculture departments to create industrial hemp research programs in partnerships with universities. Kentucky now has more than 200 hemp growers and several major processing facilities, while Maryland has a program in name only.



However, Maryland could become a hemp leader. Agriculture remains the state's largest industry, with approximately 350,000 people employed in some aspect of farming. More than 2 million acres—approximately 32 percent of the state—are farmland.⁵ The corn-wheat-soybean rotation in Maryland lends itself well to hemp, which thrives in the same conditions. Maryland's farm belt is within 90 minutes of Baltimore on either side: To the West are the dairy farms and orchards of Frederick and Washington counties; to the East, the poultry and corn farms of the Shore.

Baltimore, meanwhile, is well-situated to process hemp and turn it into various products. For clothing and textiles, the city is home to the rapidly expanding sportswear company Under Armour, and students majoring in textiles at the Maryland Institute College of Art. For the biomedical sector, it offers the University of Maryland Medical Center, Johns Hopkins University and Hospital, and the two institutions' biotech park initiatives. Morgan State University is developing a botanical program to prepare students for careers in manufacturing health supplements and other pain-reducing products

from plant extracts instead of the synthetic and often addictive ingredients used today. The city has vacant buildings; an eager workforce; affordable housing; and access to Interstate 95, rail lines, and a deep-water port.

Yet, Baltimore and Maryland could be passed over if the state does not move quickly to legalize hemp. Pennsylvania is already issuing hemp-growing licenses. Virginians are farming hemp in conjunction with their universities and looking to grow it unrestricted. New York wants to expand its hemp-growing program. North Carolina, the nation's textile epicenter, is planning to grow and process hemp.

This report looks at the history of hemp cultivation in the United States, why it was banned, and the factors bringing it back. It weighs the benefits and limitations of hemp, and its possibilities for Baltimore and Maryland as a job creator and an environmentally friendly crop. Finally, the report will warn of the costs of inaction: loss of job opportunities, economic development dollars, and education potential and recommend steps to build a hemp industry.

I. Hemp and its History

In 1938, Popular Mechanics magazine touted hemp as a “billion dollar crop” and estimated that the plant could produce more than 25,000 products. That might have been an exaggeration, but only a slight one.⁶

Hemp comes from the plant *Cannabis sativa*. It differs from marijuana in that marijuana’s active ingredient is tetrahydrocannabinol, or THC, while hemp’s is cannabidiol, or CBD. Both are types of cannabinoids. Hemp contains low amounts of THC, which has mind-altering properties—usually less than 1 percent, and in many places, less than 0.3 percent, as required by law. Marijuana contains 5 percent to 10 percent THC.⁷ Farmers often describe it as the difference between seed corn, which tastes great with butter on a summer day, and field corn, which only livestock and poultry want to eat. U.S. Senator Ron Wyden from Oregon uses the analogy of a portobello mushroom

and a psychedelic one—same species, different attributes and purposes.⁸

Hemp products and benefits

Hemp’s main use categories are fiber, fuel, food, and medicine. For fiber production, the plant’s stalks are left to rot in the field, a process called “retting.” They break down and become separated into bast fibers and woody hurds, also known as pulp. Hemp fibers were famously made into rope for America’s ships, but hemp was also spun into canvas, shoes, denim, fine fabrics for apparel, carpets, purses, and many other goods. The woody hurd can be used to make building materials, absorbents for wastewater plant spills, cement, and animal bedding.⁹

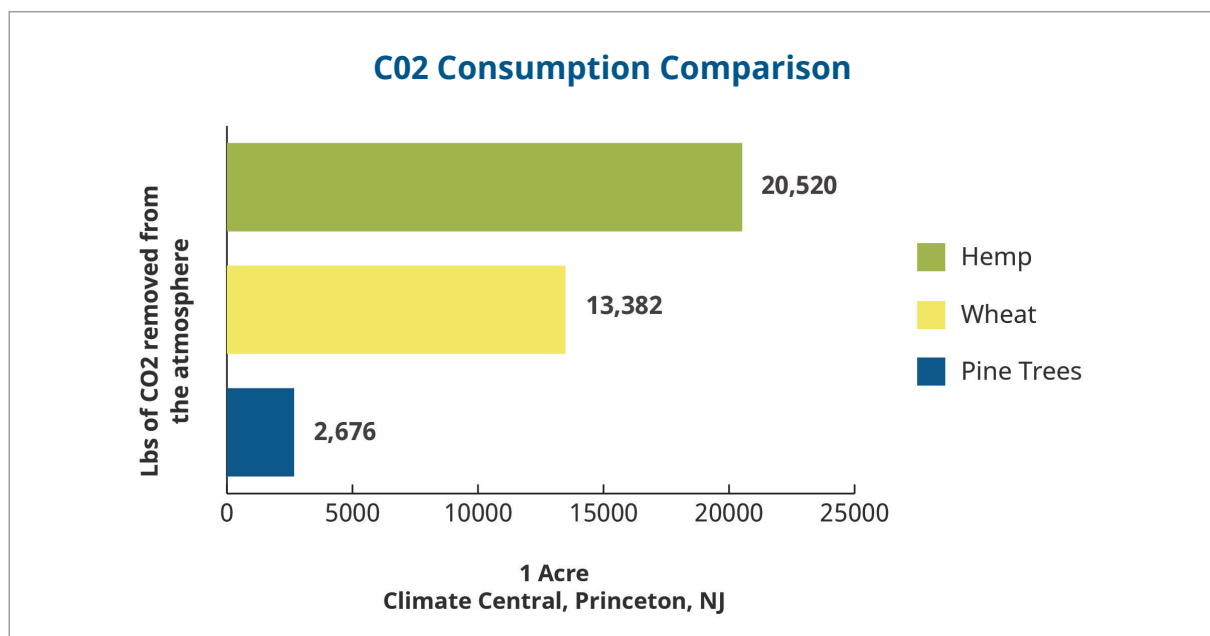
For food, the hemp seeds are crushed to make meal for birds, livestock, or human beings; or shelled to resemble a trail mix snack. Pressing the seeds yields a protein-rich oil that can be used for cooking or salad dressings, and also for soaps and balms. In addition, hemp oil can be a fuel, or an additive that makes paint fire-resistant. That is an important development, as toxic flame-retardant chemicals have shown up in recent years in everything from couches to paints to children’s pajamas.¹⁰

Much of the hemp harvest worldwide has been for the seeds, in part because conventional combines used for grain work well in this area. Farmers have been experimenting with a dual crop for hemp, for fiber and oil, as well as a combine (a self-propelled harvest machine) to harvest both. A dual crop is tricky because the best time to harvest the fiber is before the plant has a chance to flower. It’s possible to do, though researchers say it will result in a less high-grade fiber. Currently, most hemp that farmers grow is for fiber, or seed, but not both.¹¹

The medicinal aspects of cannabidiol, or CBD, are the most lucrative and the most complicated. Early Americans used CBD oil to treat a variety of ailments; researchers say it



This poster was part of a campaign appealing to farmers’ patriotism to grow hemp for the Navy after sources in Asia were no longer available. When the war ended, so did the campaign.



has promise today to treat inflammation, nausea, anxiety, and some mental illnesses. Particularly promising is its ability to reduce seizures in epileptics.¹² But growing hemp for CBD is still new domestically, and the federal government still considers the extract a controlled substance. States where hemp is legal have said that CBD is legal under their laws, but the issue remains murky. Still, those who grow hemp and process it for CBD find the effort worthwhile; University of Kentucky hemp researcher David Williams said pure CBD molecules are worth about \$7,500 per pound.¹³

Hemp has environmental benefits, too. It has a short growing season, takes less fertilizer than corn as a fiber crop, helps replenish the soil, and does not require much weed control. In fact, no pesticides are allowed.¹⁴ The EPA has not approved any pesticides for any cannabis variety, and states that allow hemp to be grown require farmers to abide by that rule.¹⁵ Frequent pesticide spraying for corn and other crops, research shows, has led to water contamination, intersex fish, and the near-collapse of bee populations.¹⁶ A plant with no pesticides is a welcome change.

Further, an acre of hemp removes eight times as much carbon dioxide from the atmosphere

as an acre of pine trees, and nearly twice as much as an acre of wheat. Carbon dioxide is a dangerous greenhouse gas that contributes to global warming.¹⁷ Instead of planting more trees, perhaps cities and counties should plant more hemp.

Hemp and marijuana: A problematic connection in need of untangling

If hemp is so beneficial, why was it banned? Hemp planting declined somewhat when slavery became illegal, as the process of retting fibers was labor intensive and the cotton gin had made production much easier for that textile. The rise of synthetic fibers played a role, too, and DuPont, maker of nylon, lobbied powerful friends in the government to favor the new materials over the old ones. Timber interests, similarly, might have pushed a switch from fiber paper.

The biggest culprit, however, is hemp's close association with marijuana. Marijuana was a favorite of Mexican workers, and increasingly among African-American laborers and musicians, though certainly white Americans also partook. A racially charged moral panic, most famously manifested in the 1936 film

“Reefer Madness,” helped scare public opinion to support a tax on marijuana. The insinuation was that minorities used the drug, became violent, and thus could threaten white security. As a result, the prohibition on pot and its nonintoxicating cousin became another means of subjugating minorities. Even today, there is no evidence that African-Americans use marijuana more than whites do, but plenty of evidence that African-Americans are arrested and incarcerated more often for that use.¹⁸

Law enforcement in the 1930s feared hemp could hide marijuana, and officers could not distinguish between them. But hemp and marijuana cross-pollinate and weaken each other’s active ingredients. Marijuana’s THC becomes far less potent next to a hemp crop; hemp, meanwhile, has its genetics compromised. Each becomes less desirable. Plus, hemp is planted in neat, tight rows, where marijuana is spaced out to give it room to flower.¹⁹

The Marihuana Tax Act of 1937 did not make it illegal to grow hemp—just very costly. Interestingly, the federal government lifted the tax during World War II. One government film, “Hemp for Victory,” declared it American farmers’ patriotic duty to grow hemp for the United States Navy, which needed hemp for ropes, uniforms, and sails.²⁰ Many did, but after the war, the tax was re-imposed. By then, synthetic fibers had overtaken hemp, and many of the factories built to de-cord and process hemp fiber were mothballed. The last known hemp crop of the era was harvested in 1958 in Wisconsin.²¹

In 1970, President Richard Nixon designated both hemp and marijuana Schedule I drugs, the most dangerous category for controlled substances. In a 1994 interview, Nixon’s right-hand man, John Ehrlichman, told Harper’s Magazine writer Dan Baum what many suspected: The push to put marijuana in the “most dangerous drug” category was aimed

at punishing Nixon’s enemies, specifically the anti-war and the civil rights movements.²²

Marijuana came slowly crawling back, first among enthusiasts who enjoyed smoking it, and then among doctors who sought the drug as relief for nausea. Several states, including Maryland, have made medical marijuana legal. A few, including Colorado and Oregon, have made marijuana legal for recreational use.

For several years, a group in Congress that includes some of the legislature’s most socially conservative members (many from Kentucky) has been trying to pass a law legalizing all aspects of industrial hemp to bring back job opportunities. It has not yet succeeded, leaving a patchwork state effort.

II. Hemp in Kentucky: A Cash Crop Comes Home

Across the vast farm fields of Lexington’s horse country, a familiar plant is sprouting where tobacco used to grow. Familiar, that is, to anyone over the age of 80. The last time these bluegrass fields were thick with hemp was in the 1940s. But this year, more than 200 Kentucky farmers are expected to grow close to 13,000 acres of hemp. The state now has close to 40 processors, and it has approved 525,000 square feet of greenhouse space to work on extraction and cultivation. Kentucky officials are hesitant to put a dollar figure on that, but it’s clear that dozens of Kentuckians are making at least part of their living from hemp. They still call it a pilot research program, but it is the re-launch of an industry.²³

How did Kentucky bring back hemp? Six major factors helped: farmers who fondly remember the crop (or remember hearing about the crop from relatives) and wanted to grow it again, especially because tobacco demand had plummeted; an assertive agriculture commissioner (James Comer, who later ran for governor and is now a congressman); a dedicated staff at the Kentucky Department



Hemp farmer and longtime seed dealer Tom Hutchens stands in the greenhouse with the hemp he's cultivating. Hutchens is a partner in Atalo Industries, which paid hemp farmers \$2 million for their crop in 2016. Photo credit: Rona Kobell

of Agriculture; an interested researcher at the University of Kentucky; powerful senators in Congress who address issues with the DEA; and available money in the state from the tobacco settlement to help farmers move in other directions.

A push from tobacco

Farmers from Central Kentucky who were feeling the pinch from declining tobacco production and sales formed the Kentucky Industrial Hemp Commission in 1998.

In 2000, the state passed a law to make hemp cultivation legal in Kentucky as soon as it was legal under federal law. But progress lagged, and the commission all but disbanded. Then, in 2012, Comer, a republican, was elected to the position of agriculture commissioner of Kentucky. He re-instated the commission, which had not been active. In 2013, the Kentucky legislature, in its last hours, passed a five-year pilot program, eligible

to be renewed, to license hemp growers and processors. Perhaps the bill's most important provision is that hemp would be exempt from the state's controlled substances act. As long as the state department of agriculture oversaw the cultivation, hemp would be legal to grow.²⁴

The University of Kentucky was named as a partner, and David Williams, who had spent much of his career studying turf grass, stepped up to lead the work.

Hemp farmers credit Williams and Doris Hamilton, the state's industrial hemp program manager, for taking seriously the opportunity to reverse the economic misfortunes in the nation's fifth poorest state, where coal was once (and maybe still is) king.

Feds seize the seeds

The 2014 federal farm bill authorization helped kick-start the program, with 33 acres dedicated



Hemp in a Kentucky greenhouse. Here, farmers and agronomists are trying to figure out the best varieties to grow in Kentucky soil, where the plant thrived 70 years ago. Photo credit: Rona Kobell

to hemp. But DEA agents seized the Kentucky Department of Agriculture seeds, and Comer and his attorneys had to go to court to retrieve them. Incensed over this attempt to derail an industry before it had a chance to take root, Sen. Rand Paul of Kentucky, with support from Majority Leader Mitch McConnell, established a practice that federal law enforcement agents could not use federal money to seize hemp seeds in states where hemp was legal to grow.²⁵

The standoff with federal officials is not over. Kentucky maintains it's legal, under its laws, to extract oils from hemp and turn them into products; the federal government declared late last year that it still considers "marijuana extract" a controlled substance. The Hemp Industries Association is suing over that, too.

Making green in the Bluegrass State

The link between tobacco and hemp in Kentucky feels as strong as rope. One

processing facility, Atalo Holdings, has moved into a former Philip Morris outpost in Winchester. Atalo, which is Greek for "new beginning," purchased some of its equipment for the work from the tobacco settlement money awarded to states and counties. Under the 1998 agreement, tobacco companies will pay \$246 billion over 25 years to various entities as compensation for medical bills and other costs governments incurred because of tobacco advertising.²⁶ While much of that went to anti-smoking initiatives, some also went to converting tobacco into other crops.

Atalo is a cooperative that includes Andrew Graves, a seventh-generation hemp farmer who heard about hemp from his parents and grandparents. Until recently, he grew 32 varieties of tobacco—a product, he said, he felt considerably less good about as time went on.

"Hemp brings all the healthy things," Graves said. "You're actually growing something that helps people."



The product on the left, Hemp oil, was pressed in Louisville, Ky., and was given to the writer a few miles from where it was made. The product on the right came from hemp seeds processed in Canada, then shipped to California for distribution, and then taken to Baltimore. It was purchased at the Towson Trader Joe's. Photo credit: Rona Kobell

Last year, Atalo paid its 58 hemp growers \$2 million.²⁷ For 2017, they expect that number to increase. Most of the farmers are growing the hemp for seeds that Atalo will turn into food—both hemp hearts (seeds with the shells removed), and protein powder. Some farmers, like Brennan Gikison, initially started growing seeds, but now are growing the hemp for the lucrative CBD market.

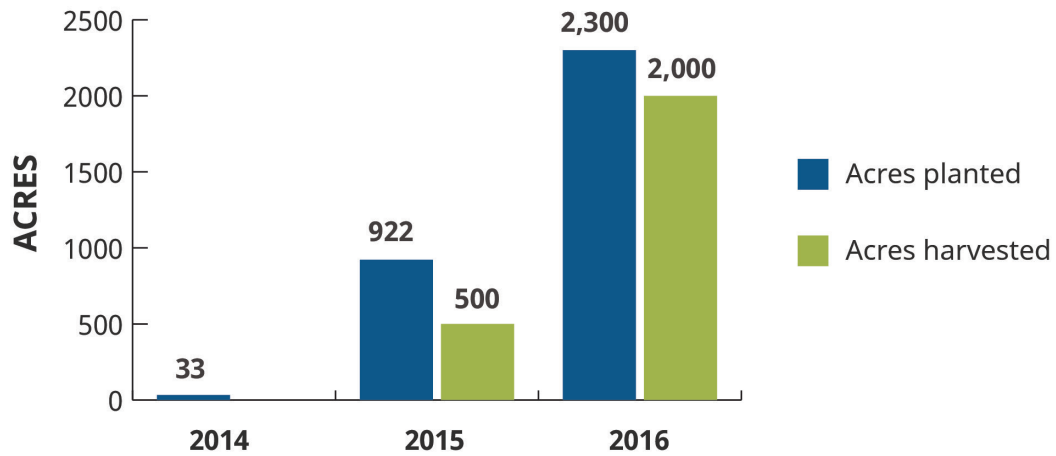
More than 100 miles away, in Louisville, Trey Riddle is standing amid bales of hemp in various stages of transformation into fiber. The founder of Sunstrand is moving his fiber processing plant to a 25,000-square-foot space, five times larger than his previous one. The hemp he collects from more than a dozen farmers is run through his industrial de-cordicator to separate the fiber from the wood core. The wood core is used for animal bedding and 3-D printing, and as an absorber for spills at wastewater treatment plants. The fiber becomes building material for the construction industry, raw material for sporting goods (hemp makes an excellent jujitsu uniform), and plastic moldings for coffee cups. The most lucrative

growth segment, Riddle said, is the \$200 million automotive components industry.

Riddle moved his company to Kentucky from Montana to be closer to his customers. But he also moved because Kentucky changed its law for growing hemp. Now, it is legal not only to process the fiber, but also to receive state grants. Sunstrand received \$750,000 in public funding to help it get started in 2014. It has 11 employees and is in the process of hiring four more.²⁸

At its new facility, Sunstrand is renting space to another hemp company, Victory for Hemp Foods, which presses seeds to make oil and other food products. Victory for Hemp's founder, Chad Rosen, also moved to Kentucky because of hemp's legal status. He came from Oregon, where both hemp and marijuana are legal, but he prefers to work in Kentucky because marijuana is not. The state is unencumbered by those who still object to the cultivation because of its bedfellow. Kentucky officials, who tend to be politically conservative, have no plans to legalize marijuana.

Kentucky Department of Agriculture, Industrial Hemp Research Pilot Program (2017)



Currently, Rosen is devoting 70 acres on six farms to growing hemp for food. But this, he said, is just the beginning—for him, and for hemp. Cannabis, he said, was “locked in a jail cell for 70 years.” We have much to learn about what hemp can do.

At his farm in Winchester, overlooking harvested stocks, Gilkison agrees.

“Hemp went out, tobacco came in, and now that tobacco is out, hemp will hopefully come back in,” he said. “But hemp is here to stay.”

III. Hemp for Maryland: Growing Nowhere

What can Maryland learn from other states? Kentucky and Colorado have jump-started their hemp industries, partly because their initial legislation was sufficiently permissive to do so, and partly because their agriculture departments were ready to register and license applicants. When Oregon revised its law in 2016, the number of farms increased from 13 to 77, which could have a large

economic impact.²⁹ California and Washington state are still building their programs, while Maine, which legalized hemp cultivation last year, is off to a slow start.³⁰

Maryland legislature: Three years of trying for hemp

Maryland had no obvious hemp champion after the 2014 authorization. Del. Daniel Morhaim, a Baltimore County physician, might have been the one, but he was working on legalizing medical marijuana. He asked his friend, Del. David Fraser-Hidalgo, to take it on. The Montgomery County democrat knew nothing about hemp, but he was a former law enforcement officer and current environmental consultant, and represented a county with 93,000 acres in agricultural reserve. If farmers in Maryland were to grow hemp, his constituents might want to have that option, too.

Fraser-Hidalgo quickly concluded, he said, that hemp was “the best kept environmental secret” and even keeps hemp hand lotion on his desk to educate visitors. In 2015, he

drafted a hemp legalization bill. Because of some legislators' confusion with marijuana, he said, the bill was gutted—making hemp cultivation and processing legal only when the federal government did. Passing the bill, he said, ensured that Maryland would not have to wait a session or two and lose a couple years of profits as it struggled to pass its own version of the federal law. Still, Fraser-Hidalgo felt it wasn't even the half a loaf one often gets in Annapolis. It was more like crumbs.³¹

He came back in 2016 with another attempt at legalization. This time, though, he wasn't alone. By his side were farmers; entrepreneurs; executives with the Maryland Farm Bureau; and Eric Steenstra, president of Vote Hemp and executive director of the Hemp Industries Association. They got an audience with Maryland Department of Agriculture Secretary Joseph Bartenfelder. Fraser-Hidalgo thinks the secretary seemed receptive.

His bill again got gutted, and he had to settle for one that allowed farmers to grow hemp only for research purposes in conjunction with the University of Maryland and the Maryland Department of Agriculture.³²



Del. David Fraser-Hidalgo, a Montgomery Democrat, said that some of his fellow delegates laughed at him the first time he tried to legalize hemp production two years ago. He has more support now, and it's bipartisan, but is not sure whether hemp will become legal to grow commercially anytime soon. Photo credit: Rona Kobell

Prospective Maryland hemp farmers could now grow the plant and experiment with how much water, fertilizer, and sunlight it needs, and where it fits best in a crop rotation. But manufacturers would not then be able to turn those fibers into clothing, dashboards, animal bedding, or sewage-treatment products. On the CBD side, simply growing the crop does not tell entrepreneurs anything about processing the extract into oils and medications, especially because cannabis oil is still a controlled substance under federal interpretation of the law. CBD companies attracted to Baltimore because of its biotech parks and its proximity to major cities may not be able to wait until the law changes, and could go elsewhere.³³

Fraser-Hidalgo knows the current situation with tightly restricted hemp growing is not going to create the industry he hopes to see, one that mirrors Kentucky's. At the start of the 2017 session, he was not sure if he would introduce a law to expand the research to include processing, or go for a legalization bill in the Kentucky mode. His republican colleague, Andrew P. Cassilly, urged him to push for full legalization. The committee on which they serve, the House Environment and Transportation Committee, supports legalization, as does House Majority Leader Del. Maggie McIntosh.³⁴

Cassilly, a free-market enthusiast who represents Harford and Cecil counties, believes hemp gives farmers a choice, and might help save a farm from development. Plus, he said, Maryland farmers already grow hops for beer. They grew tobacco for decades. Hemp is more benign than either of those.

"The sole goal here is to allow farmers to diversify," Cassilly said. "Look at all the creativity we could have had with this crop that we have lost because we haven't had access to experiment. Compare that to corn, where we have made major advances."

He added: "It's not always wise to be first, but there is also no sense in being last."

Fraser-Hidalgo decided he did not want to be last. In early February 2017, he filed a bill, H.B. 902, to allow for the broad legalization of hemp in Maryland.

Like Kentucky's bill, Maryland's authorizes a person to "plant, grow, harvest, possess, process, sell or buy industrial hemp." It would divorce hemp from its more troublesome bedfellow, marijuana, and repeal the previous provision that hemp growers must register with the Department of Agriculture before planting.³⁵

A hearing has been scheduled for March. The session ends the second week of April.

Hemp-related economic development stalled in Maryland

Hemp's current status—illegal to grow and process in Maryland due to the lack of a program to regulate it, and prohibited under federal law by long practice—is stifling the economic assistance the industry might enjoy. Maryland has no program to grow hemp, no hemp farmers, and no incentives to jump-start businesses.

Other industries that benefitted from state assistance include renewable energy, in particular efforts to turn poultry manure into power³⁶; oyster aquaculture; and wineries. All have received state grants or low-interest loans to establish themselves, and in all cases, the number of businesses in their sphere has grown.

The Maryland Department of Agriculture, Maryland Department of Commerce, University of Maryland Cooperative Extension Service, and Baltimore Development Corporation all said they were not in a position to assist potential hemp businesses because the crop is still classified as a Schedule I drug under the law.

IV. Hemp for Baltimore, and Beyond

Kentucky has answered the questions of whether farmers can grow hemp, and whether entrepreneurs can make money from it. Even while hemp is still illegal under federal law, the answer to both has been yes. How will Baltimore and rural Maryland answer those questions?

All signs point to hemp becoming a successful crop in Maryland. Hemp can survive the cold winters of Manitoba and the warm summers of Lexington. It grew here in Colonial times,³⁷ and it is growing again in the Shenandoah Valley of Virginia, about two hours west.³⁸ It requires less fertilizer than corn as a fiber crop, and it can grow everywhere corn can—preferably on the lands that yield 50 to 70 bushels of corn per acre.³⁹ A USDA Farmer's Bulletin from 1952 specifically mentions the "Hagerstown Series" as ideal for hemp—the deep and well-drained soil that is found throughout Washington County. It is suited for land that grows soybeans, and can follow corn in crop rotations to hemp rejuvenate soil. The best fertilizer for hemp, according to the 1952 Farmer's Bulletin, is "barnyard manure," a product in plentiful supply on Maryland's Eastern Shore.⁴⁰ In fact, the Shore's manure is a problem in search of a solution.

But the best reason to think that hemp can grow in Maryland is that, recently, it did.

In the 1990s, as grain prices reached their lowest levels in two decades,⁴¹ farmers turned to the University of Maryland's Wye Research and Education Center for possible alternative crops. The center has for years been experimenting with different crops to reduce pollution and help yields. Over the years, it has flirted with switchgrass, canola, and sorghum. This time, a researcher there received funds and a research exemption to grow hemp. It grew well, and the researchers used it for poultry bedding, recalls Ken Staver, the center's director. But lacking an economic plan for the crop, most of it sat in the field. When

grain prices rebounded, Staver said, farmers went back to the corn-wheat-soybean rotation that served them well.

If the Kentucky numbers are accurate for pharmaceutical products, Staver said, “there’s not a corn farmer in Maryland that would not switch.” But that market is risky. And, he cautioned, most farmers are not going to try something new without the promise of more profit if, as it seems, hemp’s prices for fiber and seed are similar to prices for corn and soybeans. Like Williams in Kentucky, Staver, who is also a farmer, sees hemp as another option, not an agricultural game-changer.⁴²

Baltimore has a “maker” culture, where artists, entrepreneurs, and chefs collaborate on projects and create new ventures, even in some cases new industries. Distilleries, for example, are making a comeback in the city, in part thanks to a rye revival. The ability to experiment with hemp might let a thousand Victory Hemp Foods bloom here, or at least a couple dozen. In creative spaces at public markets and warehouses around the city, entrepreneurs could press hemp seeds into all manner of dressings, artisan oils, snacks, and meal for baking. Builders could use insulation made locally out of hemp grown close by. Boutique owners could make and sell hemp dresses and jackets. It’s still affordable to do all that here. And while hemp needs room to grow just as corn and soybeans do and is unlikely to grow in a small, backyard lot, some urban farms might have success with it if their acreage is large enough inside or outside the city.

Several local companies are interested in processing hemp in Baltimore. Though they would initially have to import the hemp from Canada or Kentucky, these companies hope it will eventually come from local farmers who have expressed interest in growing it.

The companies asked to remain anonymous in this report, thanks to fear that the federal government will stop securing loans for those who grow or transport hemp. Uncertainty about the election also prompted this request. The



Tyler Hoff, a California hemp entrepreneur, stands in the first commercial hemp crop in Oregon. Hoff has a company called Hempaware, which helps brand and market hemp products and tells the story of the plant’s history. Photo credit: Tyler Hoff

incoming attorney general, Jeff Sessions, has spoken against marijuana, though he is also an advocate of state’s rights. The federal government has agreed not to use federal funds to enforce federal marijuana laws in states where the drug is legal. But it’s unclear how long that restraint will last, though members of Congress from states allowing cannabis are pushing for more permanent protections.⁴³

Executives from one Philadelphia company recently toured a building in Baltimore and are hoping to relocate their headquarters here as well as build a prototype hemp processing plant. The company already grows and processes 1,200 acres of hemp in Kentucky. The company reports that the prototype plant would employ about 100 people, and could contract with 50 more to grow hemp for the operation.

A second company, based near Virginia Beach, is interested in making fire-resistant paint out of hemp in Baltimore.

A California company has been working for several years to de-cord and de-gum hemp so that as a fiber it will be as soft as cotton and available to replace cotton across the world. If it works, the company said, it could bring hundreds of jobs and millions of dollars in revenue to Baltimore. It is also talking to officials in Colorado, though, and is mulling possibilities in North Carolina, which is moving along on hemp to boost its textile industry.

Company executives say they love what Baltimore offers in proximity to markets and farms as well as amenities for workers. A change in the law would solidify the decision to relocate, make investors more comfortable, and ensure the product would be local from start to finish.⁴⁴

V. Hemp for Higher Education in Baltimore

Maryland is already known as a powerhouse in the biomedical fields, with the University of Maryland Medical Center and Johns Hopkins Hospital downtown and within close proximity to industrial spaces that would be ideal for a hemp processing facility. But the state has other institutions eager to enter the hemp world.

MICA: Weaving a new purpose

On the fiber side is the Maryland Institute College of Art. At the school, with 2,000 students in the heart of the city's cultural district, more than 100 students are majoring in textiles, and 45 are studying experimental fashion. Those students often leave Baltimore after graduation due to the lack of jobs here, though many would like to remain here. Instead, according to professor Annet Couwenberg, they take jobs at Nike and IBM.

Couwenberg, who was chairwoman of the school's textile department for 19 years, is working to create a "Smart Textile Center" that incorporates modern techniques into

textile manufacturing. Those would include 3-D printing and computer embroidery, but they would also focus on how to make fashion less toxic. In that regard, Couwenberg said, hemp would be a huge help.

Right now, finding hemp clothing is difficult, and the pieces that do exist often tend to be somewhat shapeless. They are marketed to a clientele looking for hemp clothing, rather than a shopper looking for a nice dress regardless of whether it's made out of hemp. It is possible to find beautiful hemp clothing—a boutique in Traverse City, Michigan, sells some, for example. But it is far easier to go to the mall and buy something made with synthetic fabrics and dyed in India under dangerous and toxic environmental conditions.⁴⁵

Couwenberg stressed that does not have to be the case. In her native Holland, hemp is already an important fiber in manufacturing everything from clothing to car dashboards. Americans have not worked with hemp in 70 years, so we don't know all it can do. How companies brand, blend, and use it will be crucial to how it sells. It is a high-quality fiber, but it's still new to the marketplace, and the more entrepreneurs work with it the better they will be able to assess where it fits.

"I think it's necessary that we invest in this. It's one of the most versatile materials," she said. "It's strong. It takes dyes beautifully. With hemp, there are ways of opening up the fiber. And my instinct says, yes, hemp will pick up dye better than cotton."⁴⁶

If a hemp manufacturer were able to produce a fine grade of hemp, Under Armour would be interested in using it in its clothing, said Kyle Blakely, the company's senior materials director.⁴⁷ Under Armour's CEO, Kevin Plank, has expressed interest in bringing overseas jobs back to the United States.⁴⁸ If those jobs return to Baltimore because of a local hemp manufacturing center, Couwenberg said, she would have the students to apprentice at the center and possibly earn permanent jobs, and let them remain in the city.



At Morgan State University, Dr. Joseph Whittaker is working with Vitreon's J. Randall Hoggle and Michael Megginson to establish a botanicals program that will use the Morgan greenhouse. Hemp will be one of the plants researched as part of the program. Photo credit: Rona Kobell

"I do have students who know how to weave, who know how to sew, who know how to dye. They would love to be interns. They can try things out," Couwenberg said. "They are the R&D people."

Morgan State University: Planting promise

Morgan State University will have the capacity to play a major role in the cultivation and production of medical hemp when and if it is legalized. The university has about 7,000 students, a third of whom are in the science and engineering fields.

For decades, Morgan had a greenhouse where students learned botany. That major fell out of favor as most drug makers turned to synthetic chemicals and molecular innovations. But due in part to antibiotic resistance and adverse reactions to interacting chemicals, manufacturers are turning back to plants. They are hoping the extracts of thousands of botanicals can lead to cures for pain and diseases.

Vitreon America is one such company. The chairman of its board, J. Randall Hoggle, has worked with the Food and Drug Administration on protocols for testing new drugs, and has testified before Congress on his work.

Vitreon licensed the plant database of Dr. James Duke, believed to be one of the most extensive in the world. But the company, based in Rockville, needed a place to store the plants, extract their essences, and test their viability. Hoggle called Joseph Whittaker, a neuroscientist who had been dean of the science department at Morgan State for several years.

Whittaker worked with Hoggle and his partner, Michael Megginson, to prepare the greenhouse to house Vitreon's inventory and use it as a bridge for its permanent move into Baltimore. After that, the partners hope that Morgan State will supply internships, employees, and expertise to their growing company.

Morgan's involvement puts the pieces together. "So you have the best database in the world, you have documentation in the process of how to register a plant with the Food and Drug Administration, and now you are developing the unique extraction techniques," Hoggle explained.

For Whittaker, the new botanicals program offers a chance to equalize what has never been a level playing field, despite constant talk of bringing more minorities into the science fields.

"It's not about being passed over. But it's a matter of a lack of support," Whittaker said. "Like everybody else, we still have a responsibility to do innovative things. But without resources, you can't do that. So we are being innovative and creative in spite of a lack of resources."

Morgan students work with thousands of plants; one day, those involved in the project hope that hemp will be among them. Hoggle, with more than 30 years of experience in the pharmaceutical business, is optimistic about hemp's ability to provide salve for burn victims, relief for diabetic ulcers, and other pain reduction.

But Hoggle, like many others in the hemp world, has to wait. Because hemp is still illegal, he said, he needs dispensation—assurances from the state that any hemp work is indeed for research, so that law enforcement won't seize it.

"We are ready to go. But we are waiting for clarity," Hoggle said. "We have to follow the law."⁴⁹

VI. Hemp for Victory? A Tale of Two Paths

What are the perils of either acting or declining to act? Two recent examples offer apt parallels for what could happen with hemp.

The first is oyster aquaculture. In the late 1800s, the Chesapeake Bay oyster industry was in crisis. Oystermen from New England and New York were poaching from some of the last wild reefs, while Marylanders and Virginians shot at each other across the Potomac for the right to catch oysters in the river they shared.⁵⁰

Johns Hopkins scientists recommended that both states privatize their fishery, letting individuals lease the bottom from the state. Virginia did so, setting up a system by which farmers could plant oyster seed and shell on bottom they leased. But Maryland watermen refused to consider leases.⁵¹ Eventually, in 1906, the state passed a law authorizing aquaculture, but the law was so weak that oyster farming was only permitted in a few counties, and often on barren bottom.

In the early 2000s, as oysters reached a perilous state throughout the bay, Virginia scientist Stan Allen began breeding a sterile native oyster that could survive oyster diseases and thrive in the Chesapeake. Oyster growing in Virginia flourished with the new "seedless" product, and the state is now the largest producer of oysters on the East Coast. Virginia maintains its public fishery, too. It also has a robust clam aquaculture business, which grew out of the leased oyster beds. Far from putting Virginia oystermen out of business, the private leasing system created hundreds of new jobs while also cleaning the water. Oysters filter the bay, encourage biodiversity, and rebuild habitats. Having more was a benefit for everyone.

Tired of watching Virginia profit while Maryland struggled, in 2009, Gov. Martin O'Malley signed a law legalizing aquaculture statewide; Maryland also made it easier to enter the business by offering low-interest loans to potential oyster farmers, helping to choose lease sites, and cutting red tape in permitting.⁵²

Six years after the first leases were issued under the new law, Maryland oyster



Hemp seeds make great additions to smoothies, yogurts and salads. Rich in fat and protein, they provide excellent nutritional benefits. Customers can buy them at Whole Foods, Trader Joe's and many natural food stores.

Photo credit: Rona Kobell

aquaculture is now a \$5 million business. More than 6,000 acres of Chesapeake Bay bottom are under lease, with 173 different owners. Production since 2012 has increased more than 1,000 percent. The industry has created hundreds of jobs in rural areas that were struggling, and it has helped filter the water and boost the wild oyster fishery as well.⁵³

Watermen have seen some of their best harvests in years since aquaculture came along. While some watermen have converted to aquaculture, none was forced to do so, and many of the new oyster farmers came from other careers. Despite more than a century of resistance and fear, when aquaculture finally came to Maryland, it didn't take anything away. It only added an option for employment, environmental benefits, and entrepreneurial expansion.

On the other end of the spectrum is MBNA, the credit card company whose name stands for Maryland Bank National Association. Despite the name, MBNA never resided in Maryland.

In the 1980s, Charles M. Cawley, a Maryland banker, wanted the Maryland General Assembly to lift a cap on interest rates and create a favorable business environment for him and others to open more financial service businesses. When it refused, he opened MBNA in Delaware, just four miles from the Maryland line.

By the early 1990s, MBNA became a credit card juggernaut, issuing cards associated with major institutions. MBNA helped build Wilmington into a powerhouse of a town, and Cawley was a generous philanthropist. The company employed thousands of people in Delaware. Bank of America bought it in 2005 for \$35 billion.⁵⁴

Cawley had wanted to keep his company in Maryland. He always blamed the legislature for its failure to keep him here.

Hemp offers opportunities for new products, good jobs, and wellness. It can replenish our soils; reduce our dependence on pesticides that harm rivers and streams, the air, and bee populations; and save much-needed water, especially as droughts become more common with climate change.

VII. Conclusion and Recommendations

The hemp story in Maryland could look like the oyster aquaculture story—another option for entrepreneurs, a pathway to create jobs and wealth while also reducing pollution and helping the environment, a success that augments the industries that already exist (farming, manufacturing) instead of trying to replace them.

Or, it could look like the MBNA story—a tale of missed opportunities. Kentucky is already a winner in the hemp race; Virginia, New York, and Pennsylvania won't be far behind. As Cassilly said, Maryland can't be first, but it can make sure it is not last.

Hemp offers opportunities for new products, good jobs, and wellness. It can replenish our soils; reduce our dependence on pesticides that harm rivers and streams, the air, and bee populations; and save much-needed water, especially as droughts become more common with climate change. It offers an opportunity for natural processes in manufacturing clothing, paint, and furniture to replace unnatural and often toxic processes that have harmed workers and shortened their life spans. It can help farmers diversify and keep their land in agriculture. It can jump-start entrepreneurs who want to build businesses that process and transport hemp. It can provide premiere research funding and opportunities to students and faculty

at Morgan State and MICA. It can keep more Baltimore college graduates in the city to pursue careers in botanicals, textiles, pharmaceuticals, and manufacturing. And it offers synergy among the city's artists, doctors, researchers, and innovators.

If Maryland officials want to take advantage of these opportunities, they must:

1. Pass legislation making it legal to grow industrial hemp in Maryland. The bill sponsored by Del. Fraser-Hidalgo (H.B. 902) provides for that.
2. Establish a robust licensing program for hemp growers, like the one in Kentucky.
3. Engage university researchers to choose varieties best suited for Maryland, and lead research in how best to convert hemp into valuable products.
4. Make available the same types of low-interest loans and grants that other experimental industries enjoy, from oyster aquaculture to wineries.
5. Pressure the federal government to legalize hemp nationwide, to remove the risks of growing a crop still considered a drug.

The hemp rope is dangling over Maryland. Lawmakers need to grab hold of it and make the crop that fueled the colonies a part of our future.

About the Author

Rona Kobell is a reporter for the *Chesapeake Bay Journal*. For five years, she also was co-producer and co-host with Dan Rodricks of *Midday on the Bay*, a monthly public affairs show on WYPR in Baltimore. She worked for nearly a decade at the *Baltimore Sun* and has also contributed to *Grist*, *Slate*, *Modern Farmer*, *Columbia Journalism Review*, *The Boston Globe*, *The Washington Post*, *Yale Environment 360* and *National Parks Magazine*. She was recently the main writer for *The Chesapeake Bay and Agriculture Pollution*, an Abell report in 2015. She is a graduate of the University of Michigan and was a 2008-2009 Knight-Wallace Fellow at the university.

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**Hope for Hemp? A Misunderstood Plant
Prepares for its Comeback**

By Rona Kobell
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The Abell Foundation is dedicated to the enhancement of the quality of life in Maryland, with a particular focus on Baltimore. The Foundation places a strong emphasis on opening the doors of opportunity to the disenfranchised, believing that no community can thrive if those who live on the margins of it are not included.

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