The emerging [re]interest in industrial hemp

by Adam Hinterthuer
It’s a cold, late April day in Indiana, and the forecast calls for yet another week of rain. Ron Turco is growing uneasy. His window for getting seed into the ground this year is closing, taking visions of an unprecedented harvest with it. The goal is modest—only a couple of acres—but the crop Turco wants to plant hasn’t grown in Indiana soil for more than 70 years.

“We’re going to lose yield as we go into May,” he says, thinking of his two-acre research plots on the Purdue University campus. While the weather would prevent planting anyway, it’s not the reason the plots are unplanted. The seed isn’t in the ground because there is no seed to plant. And there is no seed to plant because Turco still hasn’t received his research number from the Drug Enforcement Agency.

Turco, a professor of agronomy at Purdue and SSSA member, is one of only two people with an Indiana Industrial Hemp license, which allows him to legally grow the crop for study in the state. He applied for one soon after the state passed Senate Bill 357, or the Indiana Hemp Law, in 2014 and, shortly thereafter, helped create the Purdue Industrial Hemp Research Group. The group applied for their DEA research number in February and, when that’s settled, will then need to file for an import license. Once they navigate that last bureaucratic hurdle, Turco will finally be able to order hemp seed from a supplier in Canada. If he’s lucky this year, he’ll join a handful of scientists who are beginning the slow process of dusting off an old crop and figuring out how to get it back in rotation in America—both in the ground and in the market.1

“If you were going to do tomato research, you wouldn’t have to engage the American Tomato Growers Association or the Department of Tomato Enforcement to get your seeds,” Turco wryly notes. “So there’s still that stigma attached to this.”

“This,” of course, is a singularly infamous species of plant: Cannabis sativa. And, while industrial hemp shares the same scientific name as its high-inducing cousin, marijuana, it would make a lousy recreational drug.

Marijuana’s psychoactive properties are a product of THC, or tetrahydrocannabinol. Through thousands of years of selection and breeding, humans have produced varieties of marijuana that contain THC content anywhere from 10 to 35% of the dry weight of its flowers and leaves. By comparison, commercially grown hemp averages less than 1%.

Yet the 1970 Controlled Substances Act applies to Cannabis sativa in all of its varieties, which makes hemp a highly regulated “Schedule 1” drug. And that begs a question: What led Turco, an agronomist more comfortable with corn and soybeans, to undertake a research project that requires so much paperwork, legal hurdles, and an extensive background check?

For starters, there is the immense economic potential of a burgeoning market for products like hemp seeds and fiber. That market has caught the eye of farmers looking for a new crop to help boost their margins.

And then, Turco says, there’s simply the sheer excitement of scientific discovery. “[That’s] exactly why we’re doing this,” he says. “You just don’t get to introduce a new plant very often. And this is really not a new plant, but it is a re-introduction. It’s a rediscovery.”

From War Hero to Casualty

Of course, this rediscovery wouldn’t be so exciting if the plant in question didn’t have either a fascinating history or an incredible versatility. Hemp, it turns out, has both.

Turco says he’s “blown away” by the countless varieties of hemp in the world, each with different characteristics. Some grow to knee height while others tower 12 ft above the ground. Some yield highly nutritious seeds and oils while others produce high quality fiber. That fiber can wind up in everything from paper and clothing to composite plastics, concrete, and insulation. The edible seeds and oils are stocked at high-end grocery stores and added to things like nutritional supplements, health-food snack bars, and personal care products.

The United States is the only developed country that doesn’t cultivate hemp, and our decades-long hiatus is only a brief pause for what is one of the earliest known species cultivated by humans. In America, it was grown basically as soon as settlers set foot on North American soil. In some early colonies, hemp was used as currency and farmers were required by law to grow it. For the next couple hundred years, American hemp grown in

Photo opposite page: courtesy of Hemp Industries Association.

doi:10.2134/csa2015-60-6-1

1 Editor’s note: As this article was going to press in early May, Ron Turco informed us that he just received his DEA research number and import license.
states like Missouri, Illinois, and Kentucky provided clothing, paper, and cordage to the market. It was especially popular at sea, used in ship sails, ropes, and rigging.

As American industry evolved and grew, it continued to find new uses for the versatile plant.

An editorial in Popular Science magazine from February of 1938 claimed that hemp could be used “to produce more than 25,000 products, ranging from dynamite to Cellophane.” It touted a new machine that would make processing hemp by hand obsolete, dramatically increasing production. The headline said it all: “New Billion-Dollar Crop.”

That future never came to pass. Domestic hemp was already on a downturn, competing with cotton, which had become easier to process, and cheaper hemp imported from Asian countries like the Philippines. Only four months before the Popular Science article, the Marihuana Tax Act of 1937 went into effect, an attempt by Congress to curb a “worrisome” national trend of Cannabis sativa being used as a drug. The act didn’t criminalize the production of hemp, but it did bog potential farmers down with new taxes, fees, and licensing procedures.

That might have been the end of the industry, if not for World War II. When Japan cut off American hemp imports, domestic cultivation became crucial for providing raw materials to the war effort. In 1942, the USDA launched the “Hemp for Victory” campaign. It didn’t repeal the strictures of the Marihuana Tax Act, but it streamlined the licensing process and created a market for hemp fiber to be used in shoes for soldiers, webbing for the parachutes of paratroopers, and cordage for U.S. Navy battleships. According to the USDA’s “Hemp for Victory” video, every battleship required 34,000 ft of rope. World War II became American hemp’s last hurrah.

After the war, the hemp market dried up. New synthetic fibers like nylon appeared on the scene. Hemp was a boutique crop at best. And then, in 1970, the Controlled Substances Act cemented its fate—the crop that had helped win World War II became a casualty in the War on Drugs.

The Times They Are a Changin’

Today, hemp is back in the picture thanks to growing industry interest, a few insistent and forward-thinking state lawmakers, and shifting attitudes about marijuana, with which hemp is still culturally, if not scientifically, linked.
“The momentum has gone positive,” says George Blankenbaker, manager for Real Hemp, LLC and president of its parent company, Stevia Corp. Real Hemp sells imported hemp goods like seeds and oils to U.S. markets and helps support research projects on hemp cultivation and potential uses. “Among politicians, growers, and industry, there are only a very few who are against it, and in many cases, they have misperceptions about what industrial hemp is,” Blankenbaker says.

For example, in Indiana, where Real Hemp LLC is working with the Indiana Hemp Association, the current law reflects a climate still wary about the hemp–marijuana connection. During negotiations, Blankenbaker says, one promising product, which is thought to have immense potential in medical applications, drew the ire of state police and attorneys who felt it was too similar to a drug. Nervous about rocking the boat, researchers shelved plans to explore the product in pilot studies.

These misperceptions don’t just stop at the state level. Legislation currently filed in both houses of Congress would officially distinguish hemp from marijuana, moving it off the controlled substances list and throwing the doors open for cultivation. Senators Rand Paul and Mitch McConnell, both from Kentucky, have been vocal supporters. But, says Blankenbaker, these stand-alone bills don’t have much chance of getting passed.

Despite this, the American hemp market—where imported goods are both popular and perfectly legal—has too much potential to be ignored. Consider the seeds alone. The U.S. imported about $25 million worth of raw hemp seeds in 2013. That was up from 12 million in 2012 and six million in 2011. In 2013, says Blankenbaker, the total market for hemp-derived goods grew 24% percent from the previous year. In 2014, it grew another 21%.

While it may not yet be the “billion-dollar crop” that Popular Science promised 77 years ago, hemp is halfway there. In 2012, the Hemp Industries Association, a national trade group, estimated that the existing market for imported hemp in the United States equaled roughly $500 million. New products and uses for hemp could easily push those numbers higher. With such potential, it’s no wonder so many people are getting in on the game.

To date, 22 states have passed laws allowing the cultivation and study of industrial hemp—all with strict licensing requirements. And, in 2014, Congress added wording to the farm bill that allowed these efforts to continue even though, technically, hemp is still an illegal drug as far as federal law is concerned.

As more and more politicians and enforcement agencies come to realize that marijuana is the lone black sheep in a much larger family of plants, Blankenbaker contends, it will be harder to keep hemp’s status as a “Schedule 1” drug on the books.

“We are definitely on the way to a future where it will be legal to grow industrial hemp,” he says. But, even if that happened tomorrow, he says, “we need to figure out which varieties we can grow here and get them adapted. After the War on Drugs [began] in the 1970s, all the varieties that did exist got eradicated. America had a huge portfolio [of hemp varieties], but it doesn’t exist anymore.”

Growing the Knowledge Base for Growing Hemp

With no heirloom seeds to reintroduce, researchers must rely on the closest relatives they can find from places like Canada, China, Italy, and Australia. In 2013, the Kentucky Department of Agriculture approached ASA and CSSA member David Williams, an agronomist and professor at the University of Kentucky, about their Industrial Hemp Pilot Research Program.

Kentucky Agriculture Commissioner, James Comer, had pushed to make hemp cultivation legal in the state and...
lobbied on federal efforts to do the same. Comer’s stated purpose was to “unlock the potential of industrial hemp to create jobs and farm income” in a state that had seen its agriculture sector plummet with the decline in tobacco production. To do it, he would need help from farmers and universities across Kentucky.

By mid-June of 2014—after Comer negotiated the release of Italian hemp seeds held by the DEA—Williams was tending to crops planted at the University of Kentucky Agricultural Experiment Station. By September, the plants were more than 8 ft high. It was his first look at how foreign hemp might fare in American soil.

“It does very well here,” Williams says. “We have an excellent climate for hemp. Excellent soils. So it’s a great crop for [Kentucky].”

But, Williams says, there’s a lot more to know. His primary research focus is basic agronomy, aimed at teaching farmers who have no experience with the plant how to grow it and then what to do with it once it’s grown. Existing studies from countries where hemp is currently cultivated fill in some of these gaps, Williams says, but notes that “Our environment and our soils are potentially very different, and I think, some of our end goals are different, too.”

For example, Williams is working on studies exploring how nitrogen fertilization affects the quantity and quality of the fibers produced by hemp. He’s looking into weed control, whether or not it’s required for hemp and, if so, what herbicides will be effective. He’s even exploring an untapped source of historic American hemp varieties—“ditch weed,” or heirloom plants that, long ago, escaped a farmer’s field and have survived on the margins ever since. If he finds any suitable candidates, he may turn to molecular geneticists to try to resurrect the line.

And then there is, for Williams, the holy grail: What he’d like more than anything is to someday see rows of hemp hanging upside down, curing in the rafters of Kentucky tobacco barns.

The New Tobacco?

THC is the substance that makes people high, but it is the only known psychoactive cannabinoid, or chemical compound produced by Cannabis sativa. There are dozens of others, and one, called cannabidiol (CBD), shows potential in the pharmacological world. Studies have suggested it could help treat neurological ailments like schizophrenia
and seizures, and current research in Europe, Canada, and Israel is looking into its potential for the medical field.

If CBD proves its worth as a pharmaceutical, Williams says, “then, theoretically, the production of industrial hemp solely for CBD could be an option. And that’s very exciting, especially if it follows well with the current tobacco production model.”

The collapse of the American tobacco industry hit Kentucky particularly hard. Many farmers left the business, and others are still struggling with slim margins. Hemp grown for the pharmaceutical industry, Williams says, may be the ticket back if the profits approach those of tobacco from years past. As an added bonus, the production model, involving transplant greenhouses and other specialized equipment, would be old hat for lifelong tobacco farmers. It could end up being “the same exact production model with a different species of plant grown for a different biochemical,” he says. “We grow burley tobacco for nicotine. That’s exactly why we grow it. And so, instead of growing tobacco for nicotine, we’d be growing industrial hemp for the non-psychoactive cannabinoids.”

While Williams stresses that this is all hypothetical potential, it’s not just a pipe dream. He’s currently in talks with a number of corporate entities interested in pursuing possible uses of CBD.

In the end, the market will decide whether or not industrial hemp becomes a commodity and, if so, which of the harvestable components—fiber, grain, or cannabinoids—will be profitable. As Williams puts it, “If farmers can’t make a profit, then they won’t be interested even slightly” in growing it.

Keeping Farmers on the Land

Brian Furnish is one of those farmers who is interested in growing hemp. An eighth-generation Kentucky tobacco farmer, Furnish was contracted by the Kentucky Department of Agriculture to plant a pilot plot of hemp seed on his land in 2014.

Furnish is friends with Agriculture Commissioner James Comer and ended up serving as chair of the state’s Hemp Commission, helping to lobby the state to amend its laws. “The more I learn about [hemp] and talk about it with people all over the world,” he says, “the more I realize it’s a good crop with a lot of good uses.”

Despite his tobacco roots, however, Furnish is most intrigued by hemp’s potential for fiber and seed.

“Tobacco requires so much labor,” he says, “whereas industrial hemp would hardly be any labor at all.” He says it’s a very hardy plant that requires little effort to grow once seedlings are established and that much of the work in harvesting and processing hemp could be done with machinery that growers already have on their farm. Besides, there are already known markets for seed and fiber. While it wouldn’t match tobacco-level profits, Furnish thinks that a farmer could put hemp in production where they may be growing a more marginal crop, like hay, and make “pretty decent returns.”

“I think the money will be in the fiber and the seed,” Furnish says. “I’ve been in ag ever since I got out of college, and I’m looking for a crop that can help farmers stay on the farm. A good commodity crop that’s sustainable, that’s here for the long haul. I’ve seen what tobacco can do to keep people on the farm, and I’m hoping that [hemp] is another opportunity.”

Ron Turco thinks such hopes are well founded. He knows it’s only a matter of time before he gets his Canadian hemp seed planted in Indiana soil. If not this spring, then the next. “There are roadblocks,” he admits, “but they’re not insurmountable, they’re just there.”

Besides, with each new pilot study and each new state law and even each failed bill in Congress, comes another small victory for hemp—a seed planted in a field loaded with potential. Someday, through the efforts of scientists, entrepreneurs, farmers, and lawmakers, one of those seeds is going to take, putting down roots in the right combination of market, political will, and agricultural knowledge. Turco wants to be there when it happens.

“It’s a whole new world,” he says. “We haven’t started this kind of thing ever, or in a very long time, and we’ll just see how it blows up or blows out and who’s there at the end.”