# Hemp 2021

## His Verdict: Hemp a Good Career Move

## Lawyer Gladly Trades Courthouse for Greenhouse

#### Tom Venesky

Northeast Pennsylvania Correspondent

Eric Trajtenberg's dress code for work has changed quite a bit since he left the courthouse for the greenhouse.

Gone are the briefcase, smooth shave, suit and tie of a lawyer.

Today, his beard grows freely, his clothes are a bit dirty and he wears a baseball cap to "the office."

In October 2019, Trajtenberg was feeling burned out after a 12-year career as a family law attorney. He decided it was time for a change. That's when the lawyer, who has always been a cannabis advocate, became a full-time farmer and started Paradise Hemp Farm in West Grove, Pennsylvania, growing plants in his 3,000-square-foot greenhouse and 1 acre outside, primarily for the smokable flower market.

Trajtenberg, 40, planted his first crop last year, and he immediately faced challenges with damaging rain, bugs and mold.

He left his law career behind



Photo by Eric Hurlock

Eric Trajtenberg of West Grove, Pa., is happy with his career change from lawyer to hemp farmer.

hoping stress would stay behind with it, but he quickly learned that hemp farming offers plenty of its own pressures. Still, no regrets. "As a family law attorney, you're dealing with emotional, complex issues. With hemp, I'm not waking up to any angry emails or dealing with opposing counsel," said the Villanova law school graduate. "I'm so relieved and happy I get to do this for a living."

Even when times are tough. The first challenge Trajtenberg faced was frequent precipitation early in the summer, including one downpour that dumped 6 inches of rain in four hours, washing out parts of his field and toppling hundreds of plants. Afterward, he staked every plant with bamboo poles to protect them from future rainstorms.

But problems caused by the excessive rain persisted even after the downpours were long gone.

Excessive moisture created problems with insects and mold, and even though Trajtenberg was happy with his harvest, he decided to address the weather uncertainty.

He added the greenhouse in August and plans to raise most of his crop in it this season. He already has 500 plants under roof.

"I hope I can get a nicer quality

## Why, You Ask?

Why is Lancaster Farming dedicating seven pages to hemp in this week's A-Section?

Great question.

The Pennsylvania Hemp Summit trade show and reception, originally planned for March 30-31 by Team Pennsylvania and the Department of Agriculture, has been postponed to Nov. 1-3 due to pandemic restrictions.

Consider these pages a bookmark for the upcoming event, and look forward to another section on industry developments in our Oct. 23 edition.

Until then, Hemp Hemp Hooray!

finished flower growing in a more controlled environment with the greenhouse than outside," he said. "I have natural light, propane heat, two dehumidifiers and plenty of

More **TRAJTENBERG**, page **A23** 



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#### HEMP 2021

## Baby Hemp's Fuzzy Future as a Salad Green

#### **DICK WANNER**

Staff Reporter

Microgreens are becoming a macrobusiness for entrepreneurial growers who can target restaurants, farm markets and other retail food outlets, as well as home cooks.

Tiny shoots of beets, spinach, radish, cress, peas and other greens can be grown year-round in high tunnels, barns, basements, etc., harvested in a week or two, and re-seeded for the next crop.

Some New York hemp farmers have started growing baby hemp plants for salad greens, and have been meeting with some success, Neil Mattson told a webinar audience during the 2021 Mid-Atlantic Fruit and Vegetable Convention in February.

Mattson is an associate professor of horticulture at Cornell University, and a greenhouse Extension educator.

He said he heard about farmers enrolled in New York's hemp program who were harvesting baby plants for sale as microgreens. With help from his graduate students, he launched a seed-to-taste test study that investigated every aspect of producing a baby leaf hemp crop for market.

One thing that makes baby hemp different from, say, baby radish greens, is that growing baby radish greens has never been a criminal offense.

Though commercial hemp farming was legalized in the 2018 Farm Bill, growers will still need a stateissued permit to grow hemp or buy hemp seeds.



Baby hemp could have a future as a microgreen, which would make it a high-value niche crop for greenhouse growers.

Mattson's study covered general cultural practices, cultivar selection, sowing density, seed size, fertilizer and consumer preferences.

Nine cultivars were involved in the research, some dual-purpose grain and fiber varieties, others just for grain production. Mattson didn't test cultivars bred for CBD content.

The plants were grown in 10-by-20-inch flats in a well-drained soilless substrate, mostly a blend of coconut coir and peat moss. The substrate was 2 inches deep, with another half-inch to cover the seeds. The temperature was controlled at 70-74 degrees.

Because the sprouts quickly developed a tight canopy, overhead watering wasn't an option, Mattson said. The plants were watered from below, but if the roots stayed wet for too long, phytophthora became a problem.

Germination typically took two to four days, and the greens were ready to harvest in 13 to 18 days. They were harvested at the third true-leaf stage and cut off at the cotyledon.

The dual-purpose varieties in the study were Anka, Ferimon, Wojko, Canada and Joey. The grain varieties were USO-31, Katani, X-59 and Picolo.

Yield was closely tied to germination rates. Picolo and X-59 had the highest germination rate at about 80%, and the highest yield at just over 6 ounces per flat.

Mattson also wanted to know an optimal number for seeds per flat. To find out, he used the dual-purpose Ferimon and Katani, a grain variety.

Seeds were distributed evenly in the flats, roughly at rates of 840 to 3,675 per flat. The flats that performed best got 3,000 seeds each.

Above that seeding rate, yields plateaued and diseases took off.

In another project, Mattson found that small seeds germinated poorly and did not produce marketable

He used a set of sieves to separate seeds from 3.77 mm to 2.38 mm. Seeds 2.98 mm or greater accounted for more than 70% of the seeds involved in the study.

Hemp seed vendors do not typically size their seed because CBD and fiber producers aren't too concerned about it.

But a salad hemp grower who buys enough seed might be able to work a deal with a supplier to sort out the small seeds, Mattson said.

Picolo, the cultivar used for the fertilizer part of the study, responded well to a 21-5-20 conventional

fertilizer, delivering 2.5 times the yield of a control with no fertilizer. The best organic fertilizer result was about one-third less than with the conventional product.

Mattson said baby leaf hemp might be a good addition to a mixed green salad. But in a sensory analysis in which panelists compared hemp greens on their own to baby versions of spinach, butter lettuce, romaine, kale and arugula, hemp did not appear to fare too well.

In a chart of the panelists' impressions, the nine baby hemp varieties landed on the negative side, while the five other baby greens were solidly in positive territory. Panelists reported hemp as having a hairy, fuzzy texture; an herbal, floral or aromatic taste; and slightly sharp flavor.

But Mattson said selective breeding, different growing practices or other cultivars might improve baby hemp's consumer appeal.

One takeaway from Mattson's presentation is that the future of baby hemp as a salad green is a bit



Baby hemp greens are harvested at the third true-leaf stage, and cut off

## **CBD Hemp Seeds**

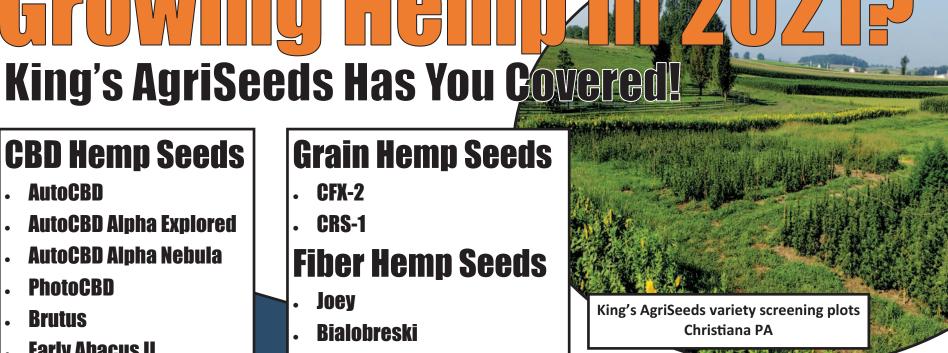
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#### HEMP 2021

## Hemp Headphone Giveaway Winner

In a 1938 Popular Mechanics Magazine article titled "New Billion Dollar Crop," it was speculated that hemp could be "used to produce more than 25,000 products, ranging from dynamite to Cellophane."

Well, now we can add a new product to the list — headphones.

The limited edition hemp headphone is hand-crafted by Grado Labs, in Brooklyn, New York, where three generations of the Grado family have been making high-end headphones and turntable cartridges since

The headphones are an open-back style and made with highly compressed Hemp-Wood, which "produces a fuller sound, comprised of a noticeable low end and a top end that extends smoothly to its limits," according to the company's website.

HempWood is a wood substitute made from hemp fibers by a company also called HempWood in Kentucky. Hemp-Wood has many uses, including flooring and cabinet making.

Grado Labs sent a pair of hemp headphones to the Lancaster Farming Industrial Hemp Podcast for review. And they looked and sounded great. And we wanted to share them with a member of our listening audience, so we hosted a giveaway on the podcast and Instagram.

The lucky winner is Luke Kneuss, a hemp farmer in New Philadelphia, Ohio.

In a comment on the Instagram, Kneuss wrote: "I began my journey into your show with the intent to gain an understanding of the legality of hemp. Now as a successful 1st year grower, I reflect on truly how many decisions I weighed so heavily based on the content of your interviews. Thank you for such an amazing tool and, even better, a welcoming community space.'



Photos by Eric Hurlock and Luke Kneuss Luke Kneuss, a hemp farmer in New Philadelphia, Ohio, is the winner of the hemp headphones giveaway. Listen to Lancaster Farming's Industrial Hemp Podcast for your chance to win future hemp prizes.

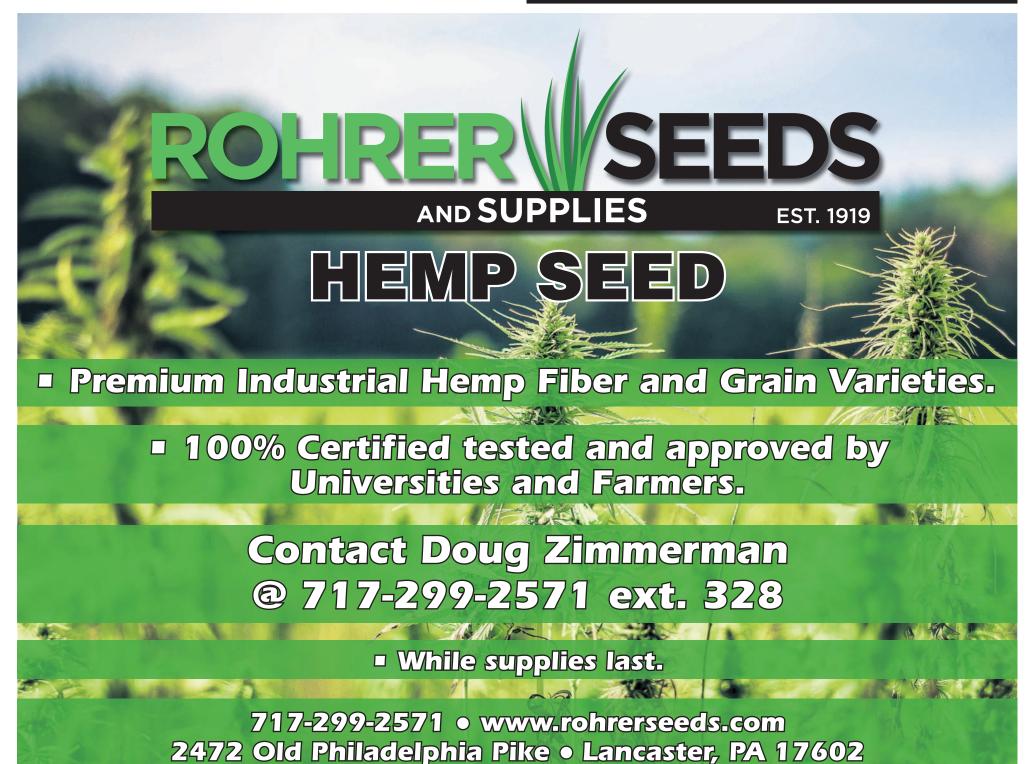


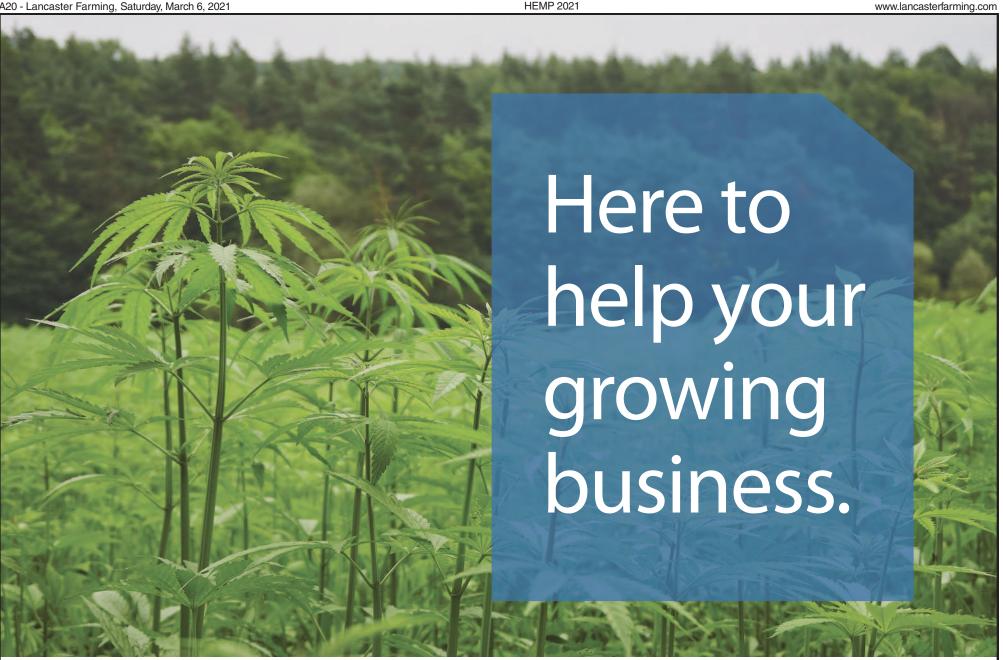




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## Is It Hemp or Marijuana?

#### New Scanner Gives Instant Answer

Texas A&M AgriLife Communications

Hemp is technically legal, but proving that it's not illegal marijuana can be a hurdle, requiring testing in a licensed laboratory.

When a truck carrying thousands of pounds of hemp was recently detained by law enforcement near Amarillo, Texas, the driver spent weeks in jail awaiting confirmation that the cargo was legal.

Stories like that inspired a team of Texas A&M AgriLife researchers to create a "hemp scanner" that could easily fit in a police cruiser and distinguish hemp and marijuana instantly, without damaging any of the product.

The study was published in January in the scientific journal RSC Advances.

#### Hemp's Heyday

In 2019, Texas lawmakers made a distinction between hemp and marijuana based on the level of THC, or tetrahydrocannabinol, in a plant. If a plant has less than 0.3% THC, it is designated hemp.

Both federal and state restrictions on hemp have loosened in recent years. As a result, the value of hemp has skyrocketed, said Dmitry Kurouski, assistant professor of biochemistry and biophysics, who led the study.

Hemp is rich in compounds that are prized for their medicinal properties and flavor. The most well-known is CBD, or cannabidiol, which is thought to help with pain, anxiety and depression.

But farmers wanting to grow valuable hemp plants need a way to know that the plants contain little to no THC. When hemp can be legally grown in Texas later this year, producers will want to know if their plants' THC levels are approaching 0.3%, which would classify the plants as marijuana and therefore illegal to have and grow.

An easy test for THC would be a boon for farmers as well as for law enforcement.

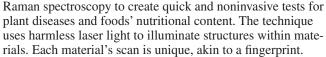
#### Could an Existing Scanner Work?

Kurouski said that the catalyst for creating the hemp scanner was his colleague David Baltensperger, professor of soil and crop sciences.

Baltensperger had worked with both farmers and police officers and knew about the demand for a better test for THC. Kurouski's lab was experienced in using a technique called

team's method.
g Scanner Work?
get for creating the home seen.

Raman spectroscopy to create quick and noninvasive tests



Kurouski had a hunch that Raman could be used to create a quick and accurate test for THC. A portable Raman scanner

had been created for previous studies by lab members Lee Sanchez, a research assistant, and Charles Farber, a graduate student.

What was then needed was a way to scan many marijuana and hemp plants in order to search for patterns in how their Raman spectra differed.

#### **Fingerprinting THC**

Testing dozens of samples of marijuana and hemp fell to Sanchez. The testing needed to happen near Denver, where recreational marijuana is legal.

"Lee Sanchez was the hero who was traveling to Colorado three times, staying there in hotels and driving from one location to another. Most of those locations are old fire stations. They are not fancy greenhouses but old, shaky buildings with plants inside," Kurouski said.

Back in Texas, Sanchez and Kurouski analyzed the collected spectra. A statistical analysis method found seven regions in the spectra that differed slightly among marijuana and hemp varieties, a high-tech version of the "spot the difference" brain teaser. Taken together, the readout in these seven regions distinguishes hemp and marijuana with 100% accuracy.

"We know plants from A to Z in terms of their spectroscopic signature," Kurouski said. "But when we saw such a crystal-clear picture of THC that appeared in one second of spectral acquisition, that was mind-blowing."

#### What's Next?

Now that Kurouski's team has demonstrated its quick, non-invasive test for THC, they are looking to collaborate with industry to mass-produce their hemp scanner. Mass production could feasibly begin in two or three years, Kurouski said.

The team also aims to create a similar test for CBD. Farmers looking to grow hemp may want to know the amount of CBD in their plants to better estimate their value.

The study also uncovered the scanner's ability to distinguish among different varieties of hemp and marijuana. In the changing legal landscape, there are thousands of varieties of cannabis, many of questionable quality.

"Our colleagues, the farmers, were positively surprised that we could identify the variety with 98% accuracy," Kurouski said. "That blew them away."

Source: EurekAlert!

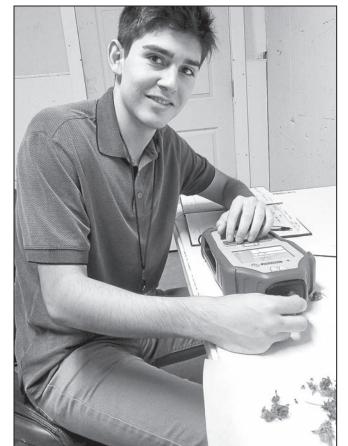
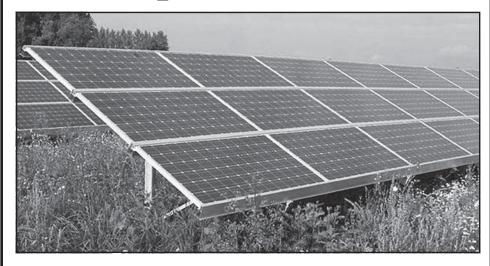


Photo by Dmitry Kurouski Lee Sanchez scans a hemp leaf for THC, demonstrating one of the dozens of scans he had to perform to perfect the team's method

## NEEDED



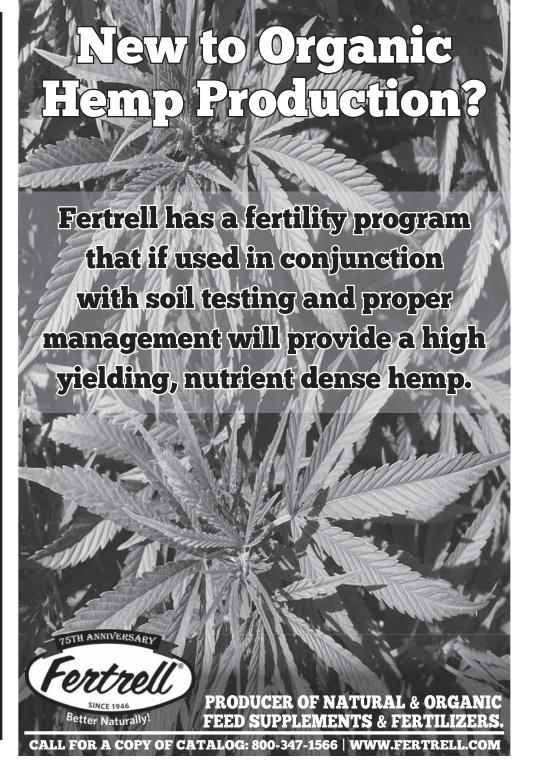
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#### HEMP 2021

## As Industry Grows, So Does Understanding of Hemp Diseases

American Phytopathological Society

As hemp begins to reemerge as an important crop in the United States, scientists are beginning research into the diseases that might prevent the crop from flourishing.

A study published in the December issue of Plant Health Progress is one of the first to examine the potential disease and disorder limitations for hemp production in the Southeast.

Lindsey Thiessen, a plant pathologist at North Carolina State University, worked with colleagues to evaluate hemp samples from her state and observed 16 different diseases. Fusarium flower blight was the most common disease, followed by helminthosporium leaf spot.

The team also surveyed hemp producers, who selfidentified fusarium species as the most common issue in their fields.

"Interestingly, diseases that are frequently reported in other hemp-producing regions in the Western U.S. or worldwide, such as gray mold or powdery mildew, were not prominent diseases in our study," Thiessen said.

The study also found

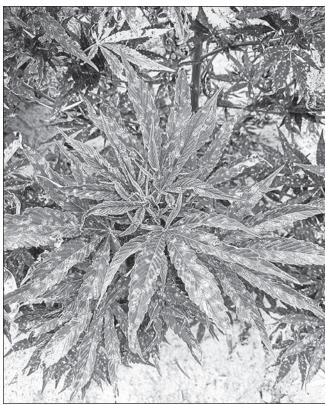


Photo by Lindsey D. Thiessen

As U.S. farmers start to grow hemp, scientists are beginning research into the diseases that might prevent the crop from flourishing.

nutritional deficiencies and toxicities in more than 58% of samples and identified issues with excess water, root binding, and herbicide injuries.

These problems may complicate production for growers in the Southeast and similar regions. This study also underscores regional variability of important diswill vary by region.

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## Vermont Announces Sign-Up for Grower-Processors

Vermont Agency of Agriculture,

Food and Markets

The Vermont Hemp Program increasingly finds that Vermont hemp grower registrants are doing more than producing crops.

Vermont hemp growers may also add value to hemp produced for cannabinoids by trimming flower for package and sale, or extracting cannabinoids from flowers to make topicals or other products. Trimmed flower is easily processed on farm with minimal investment in infrastructure.

Growers creating value-added hemp products, such as trimmed flower, from the crops they produce must register as processors with the Vermont Hemp Program.

Individuals may register as both a grower and a processor online at vermont.hemp.gov but must decide the scope of activities they will perform in the calendar year of registration.

Applicants must identify at the time of registration all locations where hemp will be grown, handled, stored and processed.

The cost to register as a combined growerprocessor is tiered, and is the greater of the number of acres planted or the dry weight of the hemp crop or viable seed processed annually.

Registrants may amend their registration, after contacting the Hemp Program, to increase the size of a cultivation area, change the location of a field or processing site.

Registrants cannot add an activity, processing or growing, after the program issues a registration for a singular activity.

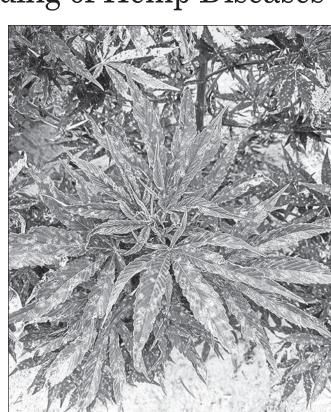
For more information about what constitutes growing or processing, visit bit.ly/VThemp-



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## eases and disorders, showing that best production practices Source: EurekAlert!

## **Podcast**

## A Conversation With Sens. Street and Laughlin

On this week's Industrial Hemp Podcast, Lancaster Farming talks to the two state senators behind the bill that would legalize adult use cannabis in Pennsylvania.

Sens. Sharif Street and Daniel Laughlin, Democrat and Republican respectively, announced the bill last week and said it prioritizes safety, social equity and agriculture.

The senators say cannabis reform is attractive to both sides of the political spectrum: economic and libertarian concerns on the right, and social equity and environmental concerns on the left. But what would it look like for prospective growers?

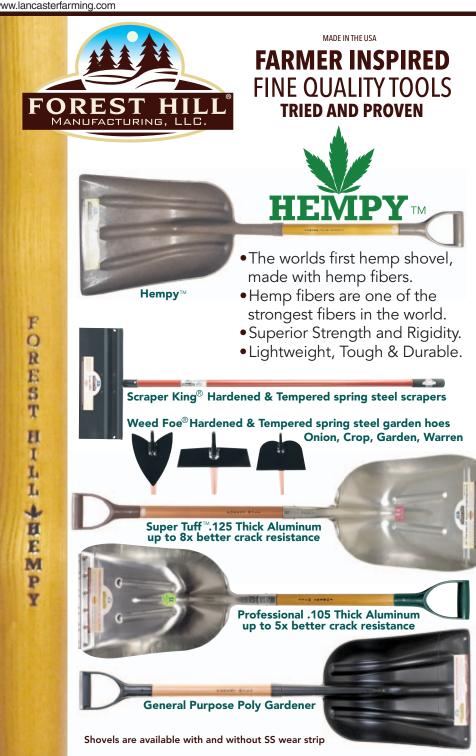
"Under our bill, the initial rollout would be 100 micro-cultivation centers that would be licensed, and then the following year there would be another 50, and then after that it would kind of be a supply and demand. If

those growers can't keep up with the demand, the cannabis board we intend to create with this bill would be allowed to issue more li-

censes on an as-needed basis," Laughlin said. What those cultivation centers would look like is still an open question, but some kind of high tunnel structure would most likely fit the

"You wouldn't necessarily have to build an expensive building. We're trying to find a sweet spot to have the right kind of protections, both agricultural protections to make sure there isn't cross-pollination," Street said. "There are some security concerns around cannabis. But the idea is to try and do it in a way that protects the public safety and keeps it affordable for farmers.

Listen to the full conversation at bit.ly/LFpodcast122 or by phone at 857-385-7946.



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#### HEMP 2021



Eric Trajtenberg grows for the smokable flower market in his 3,000-square-foot greenhouse and on 1 acre outside. He has room to expand on his 14-acre farm, where he also grows vegetables.

#### **Trajtenberg**

Continued from A17

fans because airflow is absolutely essential. In the greenhouse, I like to see the top of the leaf canopy gently moving, nothing still and stagnant.'

But a greenhouse isn't the same as an indoor growing facility, he added, and bugs can still get in.

Caterpillars and borers are what hurt Trajtenberg's plants in the field last year, and he doesn't want the problem to arise in the greenhouse.

His approach is to avoid insecticides and, instead, to fight the bugs with other bugs.

Throughout the greenhouse, Trajtenberg hung small cards containing the eggs of trichogramma wasps. After hatching, the diminutive parasitoid lays eggs inside the eggs of moths, breaking the life cycle of the pest.

"There are organic insecticides and fungicides, but with smokable flower I don't really want to spray anything," he said. "Beneficial insects are a form of organic control."

While Trajtenberg hopes he has a grasp on the issues that hampered his first season as a hemp grower, he realizes he still has a lot to learn.

Tratjenberg grows two CBD cultivars from Oregon CBD — Super Sour Space Candy and Suver Haze — in addition to a CBG strain. He selected the varieties for their use as smokable flower, and those plants are noticeably different from ones used for industrial fiber.

The large acreages grown for biomass can be mechanically harvested, he said, but plants raised for smokable flower have to be tended by hand. It's a labor-intensive process and Trajtenberg relies on the help of migrant workers, so his Spanish fluency comes in

Also, plants harvested for smokable flower have to be hung to dry for 10 to 15 days to reserve the terpene profile. Biomass can be dried in a quicker fashion.

"Growing hemp is a lot of hurry up and wait. You hurry to get seeds and clones ready to plant on time. You hurry to harvest and dry. Between that is the waiting," Trajtenberg said. "You spend an immense amount of time observing.

The most important thing a grower can

do is walk in their fields and observe what's working and where a mistake was made.'

Fortunately, Trajtenberg found there is plenty of support within the hemp industry to help prevent mistakes.

His first experience with the permitting process was smooth, thanks to easy communication with the Pennsylvania Department of Agriculture.

When it comes to regulations, Tratjenberg feels the state is trying to do the right thing and has shown a willingness to correct issues

"They know who the farmers are, and they're very hands-on with the entire process," Trajtenberg said. "They're a facilita-

Marketing his product is critical, and Trajtenberg has a firm plan in place. He's going wholesale.

'If someone comes in and buys the whole lot, it's a nice thing. I'm a grower, and I didn't start this with the desire of starting my own brand," he said.

Still, Trajtenberg is open to expanding. His farm encompasses 14 acres, including 9 tillable, so he has the room to grow. The fiber market and other industrial hemp uses are on his radar, and he recently branched into vegetables.

His proximity to Kennett Square — Pennsylvania mushroom country — has given him convenient access to truckloads of compost, which has helped the hemp plants and vegetables thrive.

"It's a nice, local resource to treat our fields, and the plants really respond to it," Trajtenberg said.

Though he is now a full-time farmer and no longer spends his days in a courtroom, Trajtenberg still practices law, providing legal advice and consultation to people and businesses in the cannabis industry. He also works to bring about legal reforms and changes to cannabis law and policy.

But that's the extent of Trajtenberg and-tie" legal profession. He's happy with the long beard, dirty work clothes and days spent in the field and greenhouse.

"I'm going to stay on this career path for the foreseeable future," he said. "Transitioning from law to hemp has been a welcome change, and I consider myself extremely fortunate to be doing this."



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