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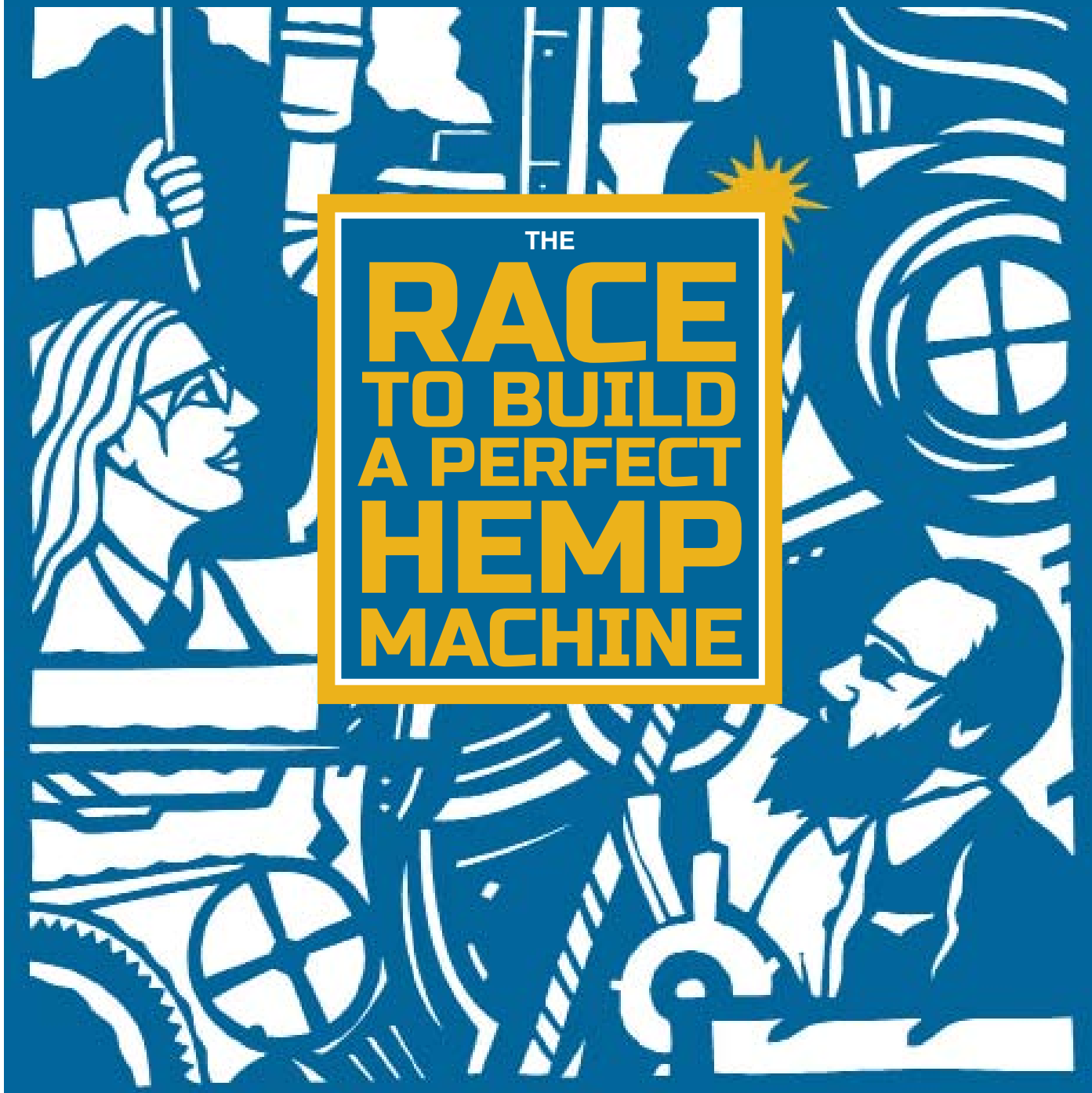
INNOVATION

Interview: Kelly Knutson, Isolate Extraction Systems



MACHINES

Field & processing equipment big & small



THE
RACE TO BUILD A PERFECT HEMP MACHINE



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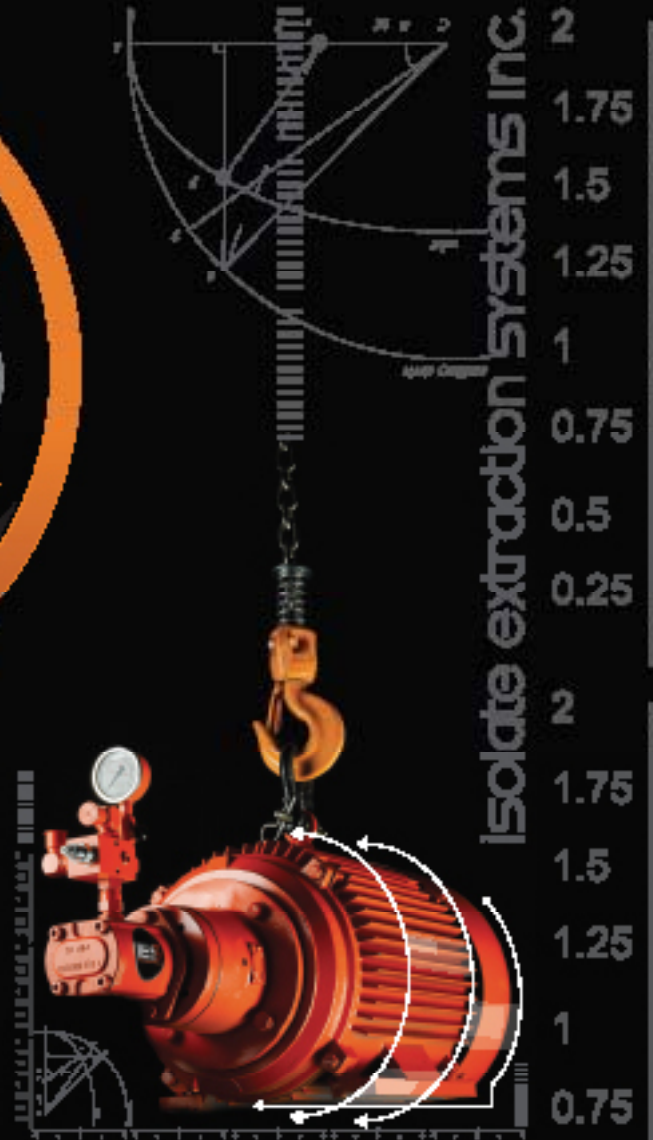


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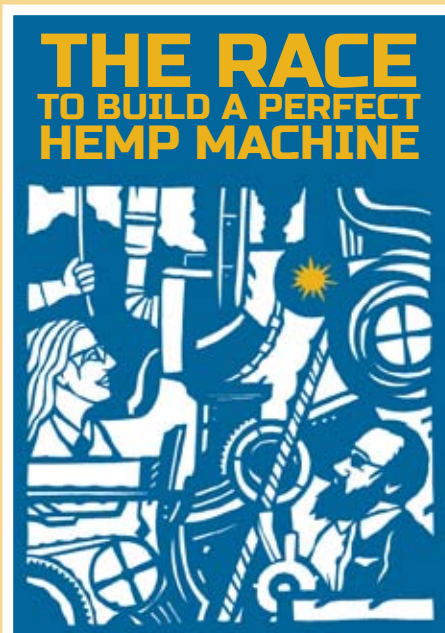
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In This Issue

Special Edition: NoCo Hemp Expo | USA | April 2018



For the industry to reach its full potential, investments are needed in technology **06**

INTERVIEW



Kelly Knutson, IES **14**
Setting the pace for high-quality extraction



The new, new thing **09**
Upgrade for the MC HC 3400

PLUS:

- Power Zone's focus on ROI – **10**
- Efficiency gain for small farmers – **12**
- Dual cropping for fiber & seed – **12**

ASIA

Chinese Hemp: 6 Key Drivers – 16

The world's hemp giant has stirred. Pay attention.

MONGOLIA: Dreams of a hemp corridor for Central Asia – **18**



EUROPE

The Long, Hard Slog – 22

CBD & THC rules slow hemp's progress

Poland: Enthusiasm for hempcrete grows – **23**

Germany: PURE expanding distribution – **24**

AUSTRALIA

Table set for foods – 20

Early entrants poised to cash in on newly opened market down under



NORTH AMERICA

Canada after the Crash – 26

USA: Hurdles to cross – 30

Hot spots: Four states where hemp is heating up – **32**

Watch: Hoban Law Group's global ambitions – **33**

HUMANITARIAN

IHBA: Raising Haiti – 34

Empowering locals to grow & build

Morocco: Monica Brummer: Rebuilding the Rif – **36**

Nepal: : Shah Hemp InnoVentures is bringing hope – **38**



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THE RACE TO BUILD A PERFECT HEMP MACHINE



While the money chasing CBD is a boon for many along the hemp value chain, more investment is needed in technology to realize the full value of this amazing plant.

With all the big hemp money chasing CBD, it's no wonder that Isolate Extraction Systems is flourishing. Well-positioned in the expanding hemp value chain, IES, Louisville, Colorado, USA has predicated a big part of its future on growing demand for cannabidiol. The company already has more than 100 extraction installations in 45 U.S. states that turn out compounds from hemp and other raw material via its CO₂-based extraction technology, CEO Kelly Knutson said.

IES is currently in the process of designing and building a new CO₂ machine that is not only faster and more efficient than ethanol, butane, or steam, but which can also automatically separate terpenes, oils and waxes mid-process, a major advancement.

The investment represented in this highly sophisticated technology is considerable. Extraction systems can range in price from several hundred thousand Euros for a baby one, to millions for large industrial operations. Aside from IES's home market in the U.S., Knutson sees demand developing from Australia to Europe, in Canada, and Central & South America. And while the extraction technology sub-sector may be a particularly sweet spot in the CBD value chain, big money is chasing the business at every link. All of that is good to hear.

In the fields and workshops

But machines to harvest the full promise of hemp also are needed closer to the earth, where most of the current investments are in blood, sweat and tears over some dream machine. In pockets around the world, independent entrepreneurs – engineers and other problem solvers – are developing small-scale, specialized hemp machines, usually providing the needed cash too.

German engineer Heinrich Wieker has been in hemp fields and in the workshop for three years developing a mobile harvester and electrically driven hemp

bud stripper that can work in the field or in a barn or small factory. It travels on a trailer behind any small truck or jeep.

While “hand-harvested” may sound like a good marketing slogan, taking swarms of people into the field to collect a crop is less and less economically feasible as supplies of hemp raw material expand. The harvester being developed by Wieker's firm, H-8 Automation, Burgdorf, Germany, is designed to deliver fluffy whole flower tops sorted from the plant's stems. Traveling through a system of chains and rollers, stems are collected

Many of the current investments are in blood, sweat and tears over some dream machine.

on one side of the machine while flowers are gathered on the other.

Out-of-pocket financing

Wieker invested personal money and signed on to bank loans to finance his harvester, all the time working a day job. His goal is to give small farmers an efficiency boost while allowing them to expand their fields, facilitating high-quality bud production while cutting labor costs.

In tiny Dzukste, Latvia, metal worker Kristaps Eglitis is working with Volde-mars Cirulis on another little dream machine, a decorticator project started by the 95-year-old Cirulis while living in Australia in the early 2000s. For the small but growing number of hempcrete building enthusiasts around the world – that includes Eglitis – it's the kind of machine that could finally be arriving at its place in hemp time.

The value of small-scale machines

These small machines fit into the current hemp landscape in two important ways. First, they have the potential

to help spark a revival of the small farming enterprise. Community Supported Agriculture (CSA) initiatives – in which producers and consumers share the risks of growing food while keeping supply and demand in balance locally – have functioned in Europe for several years. Advocates see hemp as a perfect fit into this strategy which aims to keep the supply chain close to the food source. Hemp, these visionaries say, offers not just food for the community but the potential for clothing, health aids, efficient homes and even fuel. It's a vision that puts hemp at the center of agrarian renewal, and a more sustainable way of life.

Small and medium-sized machines, mobile machines – affordable machines – also are necessary in the interim before more industrial-scale farms come on line in the giant agriculture nations such as Canada, the United States, China, India, and Australia. As the industry grows slowly but steadily, hemp fields continue to be generally small, particularly, and unfortunately, in the U.S. where federal and state governments dictate limitations on the crop's cultivation.

Big farm machines also rolling

At the other end of the farming spectrum, European hemp veteran Rafael Dulon, HANF FARM, GmbH, Berlin, continues to innovate on his Multi-Combine HC 3400 platform – a wildly flexible industrial-scale hemp harvester that's been working fields across Europe for the past three years. The system allows for the lopping off of the crop several times during the yearly vegetation, and can harvest short and long varieties of hemp as it chews through the field at 10-12 kilometers per hour, collecting and then sorting the stems, seeds and flowers.

“Of course, financially, it's a long term investment,” Dulon said of the MC HC 3400. “But continuing to perfect the harvester is a labor of love. It's our expression of confidence in the industry,” said Dulon, a 20-year veteran

MACHINES & TECHNOLOGY

in European hemp circles, a farmer and producer of hemp foods as well as flower and leaf material for extraction.

Despite the relatively restricted situation in the USA, Power Zone, a Colorado developer, also is offering a big-scale harvester and processing ensemble – one that can be used with existing farm machinery, a key selling point for farmers looking to maximize their return on investment. (story, p. 10) The platform – again, self-financed – which is designed for optimal flower yield for CBD oil and to collect hemp straw, can crawl through the field at a rate of 12 acres per hour, and features cut options ranging between six inches and 15 feet off the ground. Power Zone's Fiber Track™ decortication equipment can process up to 10 tons of hemp straw per hour, turning it into hurd for building materials.

Thank the tinkerers

Like everything else in the hemp industry these days, technological advancement cries out for investment. It's good to hear the roar of the CBD sector. It's an attractive portal to hemp for the early, high-stakes investors needed to keep things moving. Meanwhile, back down the value chain, we should thank the tinkerers, engineers and other dreamers who, with their own time and money are contributing to the industry at the grass roots level while they chase the perfect hemp machine. They send an important signal: If we're to harvest hemp for all it offers, greater investment in technology and machines is needed up and down the value chain.



Co-Conspirators

In Latvia, Voldemars Cirulis, left, and Kristaps Eglitis are working on a decorticator project started by the 95-year-old Cirulis, who is blind, while living in Australia in the early 2000s.

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MACHINES & TECHNOLOGY



The MC HC 3400, which undergoes constant refinement, has been successfully deployed in hemp fields the last 3 harvest seasons.

The new, new thing

HANF FARM's revolutionary combine gets next-generation upgrades

After three successful harvest seasons in the field, Germany-based HANF FARM's revolutionary hemp combine, the MC HC 3400, has been enhanced with an additional cutting unit on the truck. The latest improvement lets the harvester precisely chop the raw material on its way into the bin, thereby making better use of bin capacity. It also results in a significant efficiency gain in the drying of the raw material. A simple mechanism controls engagement of the cutter, which can be disengaged for other operations such as seed harvesting.

The MC HC 3400 can harvest short and long varieties of hemp, taking the tops, blossoms and seeds without damaging the plants as the machine moves through the field. The system allows for the lopping off of the crop several times during the yearly vegetation. Once cut, the tops are gently transported on conveyor belts to a bunker in a highly efficient and loss-free system.

With flexibility to cut spans ranging from 20 cm up to 3.40 meters, a maximum cutting height of 3.40 meters and ground clearance adjustable from 1.20 to 1.60 meters, the combine provides for multi-pur-

pose yields on an industrial scale, delivering maximum value from all of the crop's valuable component parts. And the harvester's adjustable double-knife cutterbar allows for scaling up as the quantity of hemp being harvested expands.

First conceived in 2014, the MC HC 3400 was Berlin-based HANF FARM's response to a growing demand for pristine hemp flowers and leaves – obtainable in the past only through laborious hand-harvesting methods.

HANF FARM CEO and European hemp veteran Rafael Dulon started working with a range of contractors and suppliers in 2014 to develop prototype technology after talking with farmers about their needs in the field. By August 2015 the company completed its initial working model.

HANF FARM says it is also working on a Multi-Combine Light Version – a smaller hemp harvesting system that can be hooked up to existing tractors.

In addition to technology development, HANF FARM is a vertically integrated industrial hemp grower, and a producer of a wide range of hemp food as well as flower and leaf material for extraction.

MultiCombine HC 3400

Key features:

- Carrier vehicle based on Hydro-Trac technology
- Ground clearance adjustable from 1.20 to 1.60 m
- Cutting width/header: 600 cm
- A powerful Deutz engine
- Hydraulic drive: 150 L/max. 200 bar
- Maximum cutting height: 3.40 meters
- Minimum cutting height: 20 cm
- Working speed: 10-12 km/h
- Wheels: 380/90 R50; Width 38 cm; Height 195 cm
- Bunker capacity 20m³
- Comfort cab
- GPS/Live camera system

HANF FARM GmbH: At-a-Glance

Profile: Vertically integrated industrial hemp grower; developer of hemp harvesting and processing technology; producer of a wide range of hemp food, and flower and leaf material for extraction.

CEO: Rafael Dulon

Founded: 1997

Headquarters: Berlin

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Built for ROI

Power Zone's dual head harvester sets the pace for multi-cropping



Grasshopper cart available in 20m³ and 40m³



Cutters on the Power Zone dual head harvester span 25 feet, and can harvest up to 12 acres per hour.

When the team at Power Zone Agriculture started to think about farmers and hemp, they put one idea first: ROI – return on investment. That started with the fundamental goal to engineer harvesting and processing technology that could be bolted onto machines and power sources farmers already have.

“Our equipment is designed to maximize yield per acre,” Corbett Hefner, V.P Research and Development and Engineering MG at Colorado, USA-based Power Zone said of the project team’s focus on financial return for the company’s clients. “No excessive capital is tied up in dedicated harvesting machinery that sits idle for the majority of the year,” Hefner added.

The entire harvesting platform can be removed in 30 minutes or less so the tractor can be used for other farm operations.

Focus on flower yield

The system is designed for optimal flower yield for CBD oil and to collect hemp straw; it can crawl through the field at a rate of 12 acres per hour, and features cut options ranging between six inches and 15 feet off the ground.

The harvesting system, which is fully portable, is designed to harvest clone plants as well as large fields. Primary crop and fiber can be collected in a single pass, reducing hours in the field.

Power Zone’s Fiber Track™ Genesis decorticating equipment can process up



The Fiber Track™ decorticator can process up to 10 tons/hr.



Grasshopper chaff carts can pair with existing combines.



Hemp Harvester with Grasshopper Chaff Cart; Fiber Track™ Genesis Decorticator

Highlights

- **Harvester speed:** 12 acres/hour.
- **Cutting height:** From 6 inches off the ground up to 15 feet.
- **Chaff cart:** Fully compatible
- **Decorticator:** Capacity 10 tons/hour.

Development time:

- **Harvester:** 4 weeks.
- **Chaff cart:** : 7 weeks.
- **Decorticator:** 16 weeks.

Project team:

Don Toews: CEO, President, founder
Corbett Hefner: V.P Research and Development & Engineering MG
Carson Toews: GM, shareholder
Greg Sanchez: Plant foreman
Max Ng: Engineering
Gene Freeland: Electrical engineer

Contact:

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 corbett@pzagriculture.com
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 pzagriculture.com

to 10 tons of hemp straw per hour, turning it into hurd for building materials. The decortication line is designed to produce long, strong fiber as well as hurd particles for insulation.

The Grasshopper chaff cart is completely self contained, drawing no hydraulic

power from the combine.

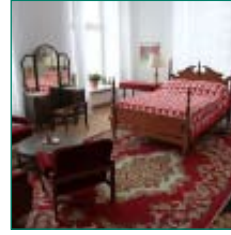
“Fiber Track™ Genesis and the Grasshopper chaff cart make large-scale fiber and hurd extraction financially viable,” said Hefner. “It lets the seed grower gain additional revenue per acre that normally gets wasted on the ground.”

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“It was beautiful to get in contact with people from all over the world.”

– Heinrich, Germany



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– Wolf, Belgium

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– Richard, USA



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MACHINES & TECHNOLOGY

Harvester/Bud Stripper

Mobile or stationary, an efficiency gain for small farmers

The hemp bud stripper is a unique technology to strip flowers carefully and gently, so the crop yield is absolutely like handstripped. It opens the door for smaller farms to higher efficiency, increasing their cropland and farmable acreage, and overall increasing competitiveness.

The machine is designed to give farmers greater independence from weather conditions during the harvest, and facilitate efficient bud production in countries with high labor costs (e.g. Germany).

The hemp bud stripper, which is driven electrically, can work in the field or in a barn or factory. The machine works on a patented principle of rollers and chains. To run the harvest one has to put the hemp plants with flowers directed to the chain-side on the infeed table. The hemp moves on chains towards the intake gap. Once the stems are caught by the chains, they move into the rollers. Stems collect on one side of the machine, and flowers on the other.



Developers: Heinrich Wieker, CEO, H8-Automation, design & engineering; Steffen Schuchardt: mechanic, welding, commissioning, workshop.

Capacity: About 100 kg of flowers/hr; more exact number can only be determined after performance tests in May and June 2018 in Andalusia/Spain.

Financing: Privately financed and independently led by the developer; about EU200.000 (\$247,000); bank loans.

Development time: Six months from concept to prototype.

Contact:
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Hempseed Harvester

Dual cropping for highest quality fiber and seed

The Hempseed Harvester is still a prototype. Built from parts of other machines, it is able to harvest hemp seed from already cut hemp stalks laying in a swath, resulting in a harvest of good quality fiber and seed. This to circumvent the problem of long seed ripening times vs. high quality hemp fiber (from fiber varieties), and creates an extra income for farmers through dual cropping. This machine works best if used in combination with a hemp straw harvester (Blücher) which lays the stalks in a swath with the flowers (seed) on top. The machine is patented, but open for anyone to use.

Developers: Marijn Roersch van der Hoogte; Rainer Nowotny; Hanffaser Uckermark eG, design & engineering

Capacity: 0,5-1Ha/Hour. But with a more modern design this could be dramatically increased.

Financing: Partly by the Hanffaser



Uckermark eG and through Crowdfunding (www.startnext.de/hanfernte)

Development time: 3 years and counting

Contact
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mrh@hanffaser.de



IES is showing the industry that we are here to stay.

Founded in 2012, IES spent the first few years establishing our identity and perfecting our product. The performance of our machines, the character of our people, and the quality of our service has ensured the company's success. This success has allowed the company to grow tremendously, and we have seen the number of employees double in the last ten months! This type of growth is an indication of where the company is headed, and we are excited to grow internationally. Our team, and our machines, have experience in a variety of fields - foremost being the commercial hemp industry in the USA. We are confident that our machines, our ever-expanding team, and our collective knowledge make us more than capable of growing with the international hemp industry. With IES, you get more than just a CO2 extractor. You get the technology, the service, and the culture that is second to none. As our customers grow, we're scaling with them and continuing to reinvent and innovate our equipment to meet the ever-changing needs of this growing industry. At IES service and support are our foundation and our customers success is our success.

www.isolatesystems.com



Driven to INNOVATE

INTERVIEW: **Kelly Knutson**, CEO at Colorado-based Isolate Extraction Systems Inc., an industry leader in the development and production of next-generation supercritical extraction technology.

HempToday: How important is hemp in your constellation of customer/partners?

Kelly Knutson: Hemp is very important to IES on a financial and personal level. We believe that hemp and CBD products are going to change the world and help millions of people live longer, healthier, and happier lives. We are in the process of designing and building a CO2 machine that is not only faster and more efficient than ethanol, butane, or steam, but also has the ability to automatically separate terpenes, oils and waxes mid-process.

HT: Where are the geographic growth markets for your technology?

KK: From Australia to Denmark there are many growth markets for our technology in 2018. Interest has been growing for commercial and laboratory scale machines in Canada, Central & South America, Europe, Australia, and of course in the United States.

HT: How fast is extraction technology changing, what's driving the pace and how do you keep an edge? What makes IES technology stand out?

KK: Driven by high demand and fast return on investments within the cannabis industry, extraction technology and competition are advancing at a steady rate. Innovation and commitment to create the highest quality product has been the primary catalyst to our success and will continue to be in the future. Versatility, consistency, and dedication to our clients drives us to create the best extraction machines available.

HT: You stress helping your customers meet safety standards and building codes. How do you address that internationally, country by country?

KK: Even within the US, nearly every municipality has slightly different requirements for equipment, facility, and operational safety. As it relates to international codes, we work with leading certification agencies and local suppliers to ensure our machines are compliant with international and coun-

consistency of potency. Knowing that stricter dosage regulations were coming, we abandoned the original recipe in order to meet these regulations. Our solution was to extract and infuse the product with oil.

At that time (2011) there were not many producers of oil within the industry. The cost was high but the value was even higher. I knew then that there would be an ever growing demand for extracts and therefore machines to do the extraction.

Having worked with several groups that did their own extractions, using both butane and CO2, I knew many of the difficulties they had encountered and believed I could create a better machine that was easier to use.

On December 7, 2012, I filed the paperwork with the state of Colorado and registered for a federal EIN. The

next day with \$10,000, I opened a bank account and started production of the first machines. A few months later I deposited another \$30,000 to finish the prototypes. Then, after four months of successful operation we began production of larger, fully automated versions. We now have more than 100 machines across 45 U.S. states and five countries.

HT: What's next for IES?

KK: This year is going to be a big year for us. We are positioned to expand into several new geographic markets and industries. I believe the biggest challenge in 2018 and 2019 will be scaling equipment for large commercial farmers who need to extract thousands of acres per year. Our goal is to be the premier CO2 equipment supplier for large agricultural operations.

'We believe that hemp and CBD products are going to change the world and help millions of people.'

– **Kelly Knutson**, CEO, Isolate Extraction Systems

try codes and directives. Canada requires a comprehensive review of every component on any machine or device. Most of Europe requires compliance with standard machinery directives as well as pressure equipment directives; however Denmark for example has slightly stricter compliance requirements for working environments.

HT: Describe the startup phase for your company. What was its genesis? How did you finance it?

KK: In 2010 I was presented with an opportunity to create and implement the production system for a cannabis infused beverage called Keef Cola. The original used cold water extracted hash, "keef," that was a suspension of solids instead of an emulsion. This leads to difficulty in the design of the bottling procedure and



At a Glance:

**Isolate
Extraction
Systems**



CEO: Kelly Knutson

Founded: 2012

Core business: Leading edge development & production of CO2 super-critical extraction technology.

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CHINESE HEMP:

6

Key Drivers



The Founder of both Hempro Int. and HempConsult, Daniel Kruse has been in the hemp industry since 1995. Hempro Int. is a vertically integrated Dusseldorf-based producer and wholesaler of hemp foods, bulk raw materials for food, textiles, accessories and cosmetics. Daniel is a senior advisor to entrepreneurs, startups, investors and other industry stakeholders through HempConsult GmbH, an independent consulting firm. He has a background in banking and studied in the USA and Germany. He is also a member of the board of directors at the European Industrial Hemp Association. (www.eiha.org), and a Senior Adviser to HempToday.

By Daniel Kruse

In the many years I've been observing the Chinese hemp market, there's never been a more exciting moment than now, as the pieces come together that can shape the Asian giant into the world's leading producer. And it's not only about textiles, as commonly thought. Here are 6 Key Drivers that will shape China's hemp industry over the next decade.



1 Legacy

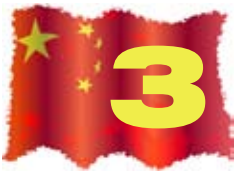
Before a long decline of the Chinese hemp industry that began in the 18th century and continued until the end of the 20th, China was the world's epicenter of hemp, which some experts say dates to circa 2,800 B.C. when hemp strands started to be twisted into rope. And while the industry shrank drastically as worldwide demand trailed off last century, hemp has always been a part of the Chinese culture, most commonly associated with the textile sector. In other words, the Chinese know hemp because they've grown it and fashioned it into end products throughout the millennia.



2 Market & economics

China is vast, and generally considered to have the biggest hemp growing fields of any contiguous market in the world. In one province alone, Heilongjiang, more than 74,000 acres of hemp were harvested in 2017 – more than half of that grown in Canada (115,000 acres, 2017) and well above Europe (33,000 hectares, 2016). Province officials say they'll double the acreage in 2018 – and that is only one province!

Looking well into the future, Chinese authorities earlier this decade rolled out a great plan to plant hemp on 1,333,333 ha. to produce 2,000,000 tons of fibres – and that's only to feed the country's textile mills. Expect textile exports to continue to dominate the hemp industry in China, which in recent years has been exporting about 2 million meters of hemp textiles annually. Aside from a massive domestic market, China is geographically positioned to take advantage of the nearby export markets of Japan, Korea, India and Australia, where demand grows for other hemp products such as cosmetics and food.

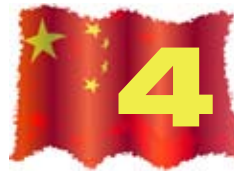


3 Replacing cotton

The Chinese see hemp as a rational replacement for the country's cotton growing and processing industry as it addresses the environmental impact of cotton -- water shortages, soil salinization and pollution from pesticides. As Chinese cotton grows less and less competitive, the Chinese see hemp is a logical, environmentally friendly substitute.

To advance the transition, new processing technology and methods are being

developed to gain fine hemp fibres. Chinese experts have worked out a process using enzymes in the development of those fibers that makes them suitable for processing by the country's vast cotton processing infrastructure to produce pure hemp fabric and blends – all the while going easy on the environment.



4 Beyond textiles

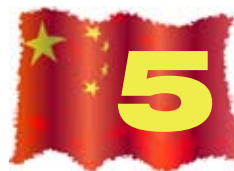
Chinese hemp stakeholders are also looking at expanded use of the plant by moving into such sectors as food, hemp oils, bio-plastics and medicine.

Hemp food and feed products are important markets in China as well as in western countries. Hemp seeds are the initial raw material for a broad range of hemp foods, such as hemp oil or hemp protein. From a nutritional-physiological perspective, hemp food products are immensely valuable. Hemp is rich in polyunsaturated fats and, above all, contains the perfect ratio of omega 6 to omega 3 (3:1). This makes hemp foods, and especially hemp oil, an outstanding alternative omega source for vegetarians and vegans – markets that are expanding the world over.

The Chinese also see a fast-growing market in hemp oil-based cosmetics. Valuable skin care substances in hemp oil make it an ideal, natural ingredient in a wide variety of excellent cosmetic products – cremes, body lotions, bubble baths, shower gels and massage oils.

And they've noticed the small but growing potential in hemp-fibre-based composites such as plastic and fibreglass, applications which are being explored in the auto and construction industries. The Chinese are already using a rougher variant of the hemp fibre to produce lightweight pre-formed doors and shelves.

Finally, as CBD gains importance in both the domestic and global health-care markets, the number of Chinese companies extracting CBD from leaves and blossom grows continuously. As THC becomes legal in a growing number of countries, the Chinese are also well positioned as medical cannabis markets expand all over the world.



5 R&D

At the same time Heilongjiang Province vastly ramped up its hemp farming this year, industry stakeholders intensified their research and development as they continue to refine ways to produce fibres for the textile sector. But researchers in Heilongjiang are also looking into applications for foods and pharmaceuticals. It is exciting to see the Heilongjiang Province, long considered the cradle of Chinese hemp, going back to its

hemp roots.

With labor costs rising, the Chinese realize they need to develop more efficient machines to replace hand sowing and harvesting and to speed up the decortication processes, which now are slow and wasteful. To address those needs Universities from Heilongjiang Province, Ukraine and Canada are conducting comprehensive research to develop new hemp varieties, more versatile and efficient harvesters and new technologies to generate fine hemp fibres, seeds and flowers. Experts expect that harvesting technologies, such as the MultiCombine HC 3400 from Berlin-based HANF FARM, will be one of the key factors for the success of Chinese ambitious plans.

Adding to those challenges is the need to develop cultivars and cultivation practices that maximize yields across the vast country's various climatic and soil regions. More high-quality, high-efficiency hemp strains need to be developed and introduced into the market in an improved and expanded lineup of seed varieties.

Meanwhile, Chinese firms and individuals have secured some 500 patents related to hemp including those for the plant itself, processing, textiles, food, oil, paper manufacturing and medicine, among others. That's well over half all patents for hemp registered worldwide – a clear indicator that forward-thinking firms see hemp's potential in China and around the world.



6 Investor interest

All this has attracted the attention of investors who are welcomed by Chinese stakeholders. At the 2017 International Conference on Hemp Industry in Harbin, more than 300 delegates from China, Australia, Europe and Canada presented success stories from all over the world and discussed future production and marketing strategies for even more and better hemp products. The conference showcased the importance and versatility of the environmentally friendly hemp plant.

Heilongjiang Province particularly is on the right track as it goes about a search for partners in Europe and North America – with wide potential for various forms of cooperation. The province has the resources to start an up-to-date hemp industry and offers subsidies as well as an outstanding infrastructure.

For the investor, it's important to note that Chinese regulations differentiate marijuana and industrial hemp directly in the field by the scientific distinguishing criterion of 0,3% THC*. That's important because as China begins to meet the demand for hemp products it can push the establishment of the 0.3% or higher THC levels in Europe and other markets around the world.

* Small, E. & Cronquist, A. 1976. *A Practical and Natural Taxonomy for Cannabis*.

Mission for Mongolia

Entrepreneurs envision 'hemp corridor' in heart of Central Asia

Roaming the native grasslands of Mongolia as a child, Anar Artur developed a fascination with the landscape and all things natural that he's carried into adulthood. That's how a fishing trip in 2013 upended his career.

"We came across some hemp plants – and that changed everything," said Anar, co-founder and CEO at startup HempMongolia LLC.

After researching hemp and realizing its many potential uses, Anar eventually quit his job in a marketing services company to focus on hemp. "I was sure that I'd found the perfect project to dedicate myself to, something revolutionary that can bring benefits not only to people but to the environment too," he said of his life change.

Anar eventually joined with his brother, Tungalag Tamir, and friend Munkhbayar Nyam-Ochir to form Hemp Mongolia, which they are developing into a vertically integrated hemp agro enterprise. The project combines agriculture and high-tech financing strategies – with a goal of resurrecting an ancient crop in Mongolia.

Important milestone. After three years of work, the company early this year reached an important milestone when it got authorization from the Mongolian government to cultivate and process hemp into a diversified line of products, including for export – the first such licenses granted in the country. Hemp Mongolia also has signed initial agreements to lease 20,000 hectares for hemp farming, Anar said.

Critical to the trio's plans is HempToken, an "eco-investment" commodity on the Ethereum blockchain.

"Blockchain technology is bringing a new level of efficiency and responsibility to international trade value chains," said

Tungalag, who serves as HempMongolia's CTO and is the driving force behind the blockchain aspect of the company's strategy. He's been watching cryptocurrency and blockchain developments since 2009, and is a whiz at online marketing, brother Anar says.

Looking for an angel. Close relations with farming officials and agriculture stakeholders and experts helped the company move quickly and inexpensively through a research and business plan development stage and into a search for investors.

The partners, who say they will offer 30% to private investors, are continuing to meet with interested parties as they look for an angel who can provide the spark for their ambitious vision, with estimates for a whopping 80% return within three years. A HempToken crowdfunding offering to raise an additional 20% will launch after the initial financing is secured, they say.

"It's necessary to build up strong capital and technological advantages to become a leading exporter," said Munkhbayar who, as Chief Operating Officer guides the company's overall strategy and leads the partner search. He sees Hemp Mongolia developing into a regional supplier of hemp food and animal feed as well as other value added by-products.

Anar notes that the Mongolian government is finally developing a strategic

plan for agriculture after years of inertia in the sector as resources and attention were focused on a national mining boom. He said the government has realized that an economic growth model dominated by the commodity sector can't meet long-term wealth creation goals.

Government policies shifting. The new policies, aimed at creating scalable employment and diversifying the country's economy by focusing on sustainability, innovation and new technologies, are driving public finance programs – and giving the agricultural sector momentum, Anar said.

Hemp fits into that strategy perfectly, according to Anar. "With its fast germination and growing strength, it's a perfect crop to withstand Mongolia's short summer vegetation period and relatively dry climate," Anar said.

And with engineering and agricultural knowhow in a rapid development phase, he said Hemp Mongolia is poised to tap into a rich pool of human resources coming out of the country's historically strong educational system.

International trade corridor. Along the way, the partners have started to popularize hemp and its many applications, talking up the plant's potential to deliver health products, textiles, building materials, food and cosmetics, and coaxing entrepreneurs to enter those sectors. They see Mongolia, located in geographic heart of Asia, becoming an international trade corridor bridging European and Asian economies. They point to favorable tax incentives, inexpensive labor and cheap land lease fees as investment incentives.

"We're building a model to attract investors so we can accelerate production and help Mongolia develop one of the most advanced agricultural economies in Central Asia," Anar said.

Mongolia: At-a-Glance

Population: 3,000,000

Arable land: circa 560,000 ha

Ag as part of GDP: 13%

Ag employment: 50% working pop.

Traditional crops: Wheat, potatoes, rapeseed



Tungalag Tamir
Chief Technology Officer



Anar Artur
Chief Executive Officer

"We can help Mongolia develop one of the most advanced agricultural economies in Central Asia."



Munkhbayar Nyam-Ochi
Chief Operating Officer

Setting the table

Early entrants poised to cash in on newly opened market

After years of struggle and disappointment, hemp industry stakeholders in Australia and New Zealand have been finally served what they wanted all along: Legal hemp food markets.

With regulatory approval that came early in 2017, Australian producers have gained access to a domestic market estimated at \$13 million in potential seed and straw production. Estimates further indicate that demand for Australian grown hemp could quadruple over the next few years – with most of that coming from firms who entered the industry early, in the states of New South Wales, Victoria, Queensland and Tasmania. Expansion of the hemp foods and CBD sectors could be a significant contributor to such a massive jump.

A hemp battle won. The battle to get hemp food products on the market in Australia dates to 2002. Now that it's won, manufacturers in both countries are now able to legally produce and sell products containing low levels of THC, and foods from the hemp seed became legal for human consumption beginning November, 2017.

Ministers from some states and territories are in the process of amending their laws to make a clear path for the industry, and are setting up an implementation and monitoring working group on hemp.

“[This decision] will also contribute significantly toward more sustainable farming in Australia, with the added bonus of creating considerable job opportunities for Australia’s farming industry,” said Paul Benhaim CEO at Bangalow, New South Wales-based Hemp Foods Australia (HFA) in the southeastern part of the country.

A ‘rush’ to hemp. HFA, which deals in hemp seeds, oil and protein, has expanded into four facilities in five years. It opened a state-of-the-art food processing plant in 2016 under a government grant, strengthening its position in the Australian market just as the new rules were adopted. HFA received nearly \$600,000 from the Australian government to build the \$1.17 million facility which it says will also help in its efforts to meet growing global demand, which HFA estimates at a total \$1.3 billion annually.

Benhaim’s firm and others had substantial seed contract business already in place with foreign buyers before the rules change opened the Australian market.



‘This decision will also contribute significantly toward more sustainable farming in Australia.’

Paul Benhaim, CEO
Hemp Foods Australia

Consumer market primed. Benhaim said the Australian market is already primed, with consumers showing recognition and a positive attitude towards hemp food products – such things as hemp seeds, hemp oil and hemp protein.

“This [attitude] has changed significantly since I first became involved in the industry in the early 1990’s,” said Benhaim, who lobbied for years to make hemp legal as a food in Australia.

The government approval was also welcomed in the island state of Tasmania. “We’ve been arguing this decision was necessary to ensure the ongoing sustainability of the hemp industry in Tasmania. It’s a giant step forward,” said Peter Skillern, CEO of The Tasmanian Farmers & Graziers Association. The state wants to build on its proven experience growing for medicinal products; Tasmania is licensed to grow poppies for pharmaceutical firms resulting in a \$290 million poppy industry.

Meanwhile, South Australia’s Manufac-

turing and Innovation Ministry has signaled it will add amendments to the state’s Industrial Hemp Bill, which was introduced to Parliament by the Greens party. “It will allow farmers to consider whether they want to grow hemp in SA and to become licensed to do so,” SA Manufacturing and Innovation Minister Kyam Maher said.

The state is also creating an Office of Medicinal Cannabis and Industrial Hemp to provide a single contact point for information and advice regarding those sectors.

In South Australia specifically, the new industrial hemp framework aims to combine industrial hemp and medicinal cannabis into one portfolio to create new opportunities for Australian companies across the food, fiber, and medical sectors.

“The opportunities for industry development of medicinal cannabis may also provide for high value jobs across the supply chain from research and development, growing, manufacturing, and transport and logistics,” Maher said.



Four of six Australian states have industrial hemp programs – New South Wales, Victoria, Queensland and Tasmania.

NZ sees economics of hemp. While less developed, New Zealand hemp proponents see a scaling up of the crop to meet consumer demand and bring jobs and investment, said Mack McIntosh of the New Zealand Hemp Industries Association.

“The high value nutrition potential is massive; phenols to fragrances are available from this one arable crop and our farmers want access to the revenue streams from the whole plant, not just the seed,” McIntosh said. “The industry could be much bigger if we include the food and beverages produced from the 20% of the crop left in the field as leaf and flowering tops.”



International Conference of the European Industrial Hemp Association (EIHA)

www.eiha-conference.org

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- Traders and Investors



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The long, hard slog

Lack of clarity over CBD, THC hold back hemp on the continent

European hemp stakeholders are ramping up the discussion of key challenges to industry growth — especially underscoring the need for rational, supportive rules addressing acceptable CBD and THC levels for industrial hemp products.

Setting standards for allowable levels of the compounds is “rather urgent,” said Mark Reinders, President of the European Industrial Hemp Association (EIHA). “CBD and food are important for their profitability. We need to see how we can keep these products available for exploitation” by hemp firms, Reinders said.

Key to that, according to Reinders, is working to establish a level playing field under European Union rules while also pushing national governments to knock down local regulatory barriers.

Fast market growth

Despite the unclear rules, Europe’s CBD market is growing fast. “We see that first-generation CBD products are being replaced by more sophisticated ones. Many new products are entering the market,” Reinders said. “The customer base is moving from the innovators to the early majority, with a logical drop in prices to more mature levels as more and more suppliers enter the market.”

Of course, the CBD gold rush has brought with it a downside, according to Reinders. “We already begin to observe some price wars now, which isn’t helping the industry at all,” he noted, adding that some bottom-feeder CBD suppliers are turning out products of questionable quality, compounding CBD’s struggles with bad PR.

“This . . . damages the trust in hemp products. As an industry, we need to commit to quality standards that generate reliable hemp products, to create more trust in the marketplace,” said Reinders.

Three-tier framework proposed

EIHA has proposed a three-tier regulatory framework for products containing CBD, noting the current “tenuous patchwork” of rules covering CBD and hemp extracts in the European Union put in peril the CBD food supplements sub-sector.

The Association had a hand in progress at the global level late last year



Bringing in the harvest at Hempoint in the Czech Republic, where organic hemp is picked by hand.

as its advocacy for CBD played a major role in a positive evaluation from the World Health Organization (WHO). Further critical WHO guidance on CBD will come in May or June 2018 during the 40th meeting of the organization’s Expert Committee on Drug Dependence (ECDD), according to Boris Bañas, The Hemp Cooperative, Slovakia, and a board member at the EIHA. The Association joined the Foundation for Alternative Approaches to Addiction (FAAAT) in drafting a joint statement of guidance ahead of last year’s WHO evaluation.

Self-policing the market

Meanwhile nascent efforts to self-police the CBD market got under way last year when the International Cannabis and Cannabinoids Institute (ICCI) began testing products and checking the claims on their labels. Rather alarmingly, ICCI found that only 9 of 29 European CBD oils proved “satisfactory” when tested for polycyclic aromatic hydrocarbons (PAH) — classified as carcinogens — prompting the Prague-based group to issue a warning about CBD and cannabis oils sold on the EU market.

Pushing THC issues

EIHA also continues to push THC issues, most recently repeating its demand that the European Commission develop harmonized guidelines for THC in hemp food products, based on an earlier released position paper in which the group makes a wide range of recommendations aimed at harmonizing legislation affecting THC levels across the EU. For now, stakeholders are looking to boost the allowable level to 0.3% THC.

“EIHA demands rational THC limits for industrial hemp in accordance with international regulations,” the Association said in an early 2018 release. It called for an easing of the 17-year-old restriction that sets maximum THC content for industrial hemp at 0.2% in Europe while other markets around the world set that limit at 0.3%.

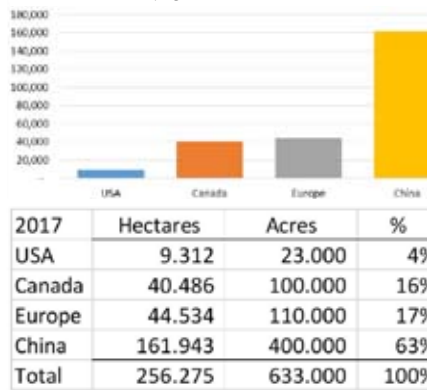
Euro food sector at €40 million

“The hemp food sector has grown with considerable speed over the last several years and has reached a volume of €40 million in Europe and a global volume of €200 million,” according to EIHA. “Reasonable regulations, especially harmonized THC guidance values, are crucial for the further development of the domestic hemp food industry.”

The Association specifically called for the creation of a working group in the Directorate General for Health and Food Safety to address THC harmonization as it

Chasing China

Combined fields under hemp in Canada & the USA have now surpassed those in Europe. Hectares of hemp grown in 2017*



*1 hectare = 2.47 acres

CannaCoach.org

affects food from hemp seeds and leaves.

Despite the struggles, all indicators point to a continually expanding CBD market in Europe, with many suppliers across the continent also exporting to CBD-hungry North America. The demand for CBD is also spelled out in the search for planting seeds, said Hana Gabrielova, CEO at Hempoint, a vertically integrated Czech hemp company.

No guarantees on CBD strains

“Everybody is asking for high CBD strains, none of which are registered yet in the EU,” Gabrielova said. “We’re having to do a lot of explaining to many clients that there are no registered seeds

that were bred for high CBD. There are no guarantees about the levels of CBD in any of those certified strains out there.”

The lack of certified high CBD hemp varieties on the EU list of legal cultivars is attributable to the 0.2% THC limit observed in most European countries, Gabrielova noted. “The varieties are registered for seeds yield or fiber content but not for CBD content,” she said. “There’s been no breeding done so far for that, so nothing is stabilized yet,” she said.

Rapid innovation

None of that has stopped the innovation with CBD. Most notably in Europe over the past year, low-THC, high-CBD hemp green matter is being sold like tobacco, rolled into cigarettes and in loose pouches. The craze started in Italy and Switzerland, both of which have relatively high allowances for THC in hemp (Switzerland up to 1%; Italy 0.6%) that are well above the 0.2% level observed across most of Europe.

Dubbed “nobacco” by American hemp guru Richard Rose, the product “is all health and no high,” says Rose, noting that CBD hemp can be grown like marijuana, either indoors or out.

“I see no barriers to entry in the U.S. or EU,” said Rose, who sees a vast potential market in the U.S. among aging pot smokers who don’t want the strong high in marijuana, and tobacco smokers looking for a more healthy alternative.

Deep Green Building

Interest in hempcrete is building in Europe



Belgian natural builder Wolf Jordan demonstrated wall construction and the application of hemp-lime as finishing material at Deep Green Building I 2018.

Few figures are recorded about the growth of hempcrete construction in Europe, but leading builders and suppliers of hurd generally point to France as the continent’s leading hemp-lime building nation. While some cast doubt on reports of “thousands” of hemp structures going up annually there, few argue about France’s leading and historic role in Europe.

Meanwhile, Italy and tiny Belgium are seeing upticks in hempcrete projects, according to long-time natural builder Wolf Jordan, Wolf Jordan & Company, a Belgian builder and supplier. And in Poland builders Premyslaw Brzyski, Budynek z Konopi and Piotr Jastrzebski, Podlaskie Konopie say they have several builds scheduled this year after putting up three structures in 2017.

Jordan, Brzyski and Jastrzebski recently headlined a winter session of Deep Green Building, an ongoing series of international hemp-lime building courses at HempToday

hemptoday.net/deep-green-building

Center where the material is going into walls in the attic of an 18th Century palace to create hospitality and learning space.

Indicating the wide interest in the hempcrete movement, representatives from 9 European countries -- Germany, Poland, Czech Republic, Sweden, Holland, Finland, Turkey, Latvia and Portugal -- were on hand for three days of lectures and hands-on training.

Wider acceptance of hemp-lime by mainstream architects and the broader green building movement are generally considered the keys to expanding the use of hempcrete, European builders say. And while that may be slow going, we can still do a lot by pulling together committed hemp entrepreneurs to build, build, build; by getting together to share knowledge, form business relationships and bring others into the fold.

— Kehrt Reyher



THE PURE PEDIGREE

Hempro Int. looks to expand iconic brand's distribution

After purchasing the PURE brand of hemp accessories last year, leading European hemp company Hempro Int., Dusseldorf, Germany, says it is now looking to expand distribution of the line of hemp backpacks, rucksacks and bags around the globe, says CEO Rebecca Kruse.

With its acquisition of PURE, Hempro Int. strengthened its position in hemp textile-based accessories. Because the company had been selling PURE bags since 2001, then became a licensee in 2005, its knowledge of the brand and bringing it fully in house opens broader marketing and product development possibilities, Kruse said.

PURE's pedigree

The PURE brand dates to 1995, when its PURE HF Collection of bags was first introduced to the market (well ahead of its time). Hempro Int. has been selling PURE accessories since 2005, which means the company is intimate with the brand values that have driven the products' success in the marketplace.

"In the case of PURE, we know our customers value functional design, quality

and durability – and those are what the brand delivers – backed up by a guarantee. We make it standard practice to not just live up to expectations, but exceed them," Kruse said.

Finding perfect 'fit'

Beyond quality factors, brand personality and character strongly contribute toward finding the right "market fit," not just for the customer but up and down the value chain, according to Kruse. And a key consideration for Hempro Int. and its PURE suppliers and customers is the sustainability the products offer: All materials that go into PURE accessories are traceable back 100% to ecological sources.

As Hempro Int. has carefully added more and more products through the years, the deal with PURE was a special one, according to Kruse. "We have a long history with these products, their creators and the brand," Kruse said. "So it was a natural fit. We know the owners personally, and it all went down as deals like this should, with both sides really happy in the end."

Continual innovation is not only required, but so is the communication

of those innovations to the marketplace. "With our PURE line we're constantly brainstorming new products and improvements to the products in our existing portfolio," Kruse said.

Fashions & accessories

Adding the PURE brand to Hempro Int.'s portfolio is only the most recent milestone in a 16-year corporate history marked by careful strategic acquisitions and organic development of the company's product lines. Hempro Int. also offers hemp fashions via its The Hemp Line brand, which has been selling clothing for more than a decade.

Hempro Int.'s overall portfolio also includes HANF FARM, a consumer brand for hemp foods. That division has been a major factor in the company's emergence as a leading player in the European hemp market over the past two decades. Next to its own-brand products, Hempro Int.'s main business is industrial scale hemp foods production and bulk distribution, through which the company is meeting demand for raw materials in the fast-growing hemp foods sector in Europe and around the world.

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After The CRASH

Canadian stakeholders regroup around CBD after boom, then bust on South Korean food market

Despite a mini-boom in hemp seed exports to South Korea that quickly turned into a mini-bust, Canadian hemp stakeholders are still upbeat as they look forward to changes anticipated under a proposed new licensing regime for industrial hemp growers – and the promise it offers in the lucrative CBD market.

“Their (South Korea’s seed) market helped to partially clear a burdensome carry-over in 2016, but now that has improved so there is no need to discount the market,” Russ Crawford, President at the Canadian Hemp Trade Alliance (CHTA), told HempToday.

“While Crawford said Canada returned to the Can\$100 million (\$79 million) export mark for 2017, stakeholders expect fields will be down in 2018 as farmers turn a bit skittish.

United States remains the biggest export destination for Canadian hemp seed, with about 90% of output going south across the border. But with Chinese seeds beginning to hit the U.S. market, Canadian producers could be under increasing pressure.

Meanwhile prices are falling. Crawford said hempseed prices have dropped about 20 cents this year, to around 55 cents per pound.



‘The loss of that (South Korean) market hurts, but it wasn’t the most profitable in any event.’

Russ Crawford
Canadian Hemp
Trade Association

Canada exported a total of about Can\$72 million (\$57 million) worth of hemp seed in 2015; with South Korea’s contribution of nearly Can\$45 million (\$35 million) in 2016, that figure jumped to Can\$123 million (\$97 million), according to figures from Statistics Canada and CATSNET Analytics.

‘Korean bubble was real’

“The Korean bubble was real for Canada,” another source close to the situation told HempToday. After a few Canadian pioneers entered the market in 2015, “many other Canadian companies rushed in to service the vast food market in Korea,” the source said, where tele-marketing has created strong consumer demand for hempseed food products.

“The bottom fell out when the South Koreans realized that the Chinese have been churning out hulled hemp seed in tonnage quantities, and at less than half the net price,” the source said.

That’s left Canadian farmers again sitting on a lot of seed inventory for the present, which could be a constraining factor in the growth of hemp fields this year.

“That put us into a situation where we went back to our producers and asked if they would reduce some of their acres,” Jeff Kostuik of Hemp Production Services, which contracts hemp acres and provides support to farmers told The Western Producer. But many hemp farmers in Canada did not hold back in spite of the South Korean situation, according to Kostuik.

Fields under hemp in Canada last year were reported at 55,380 ha. (137,000



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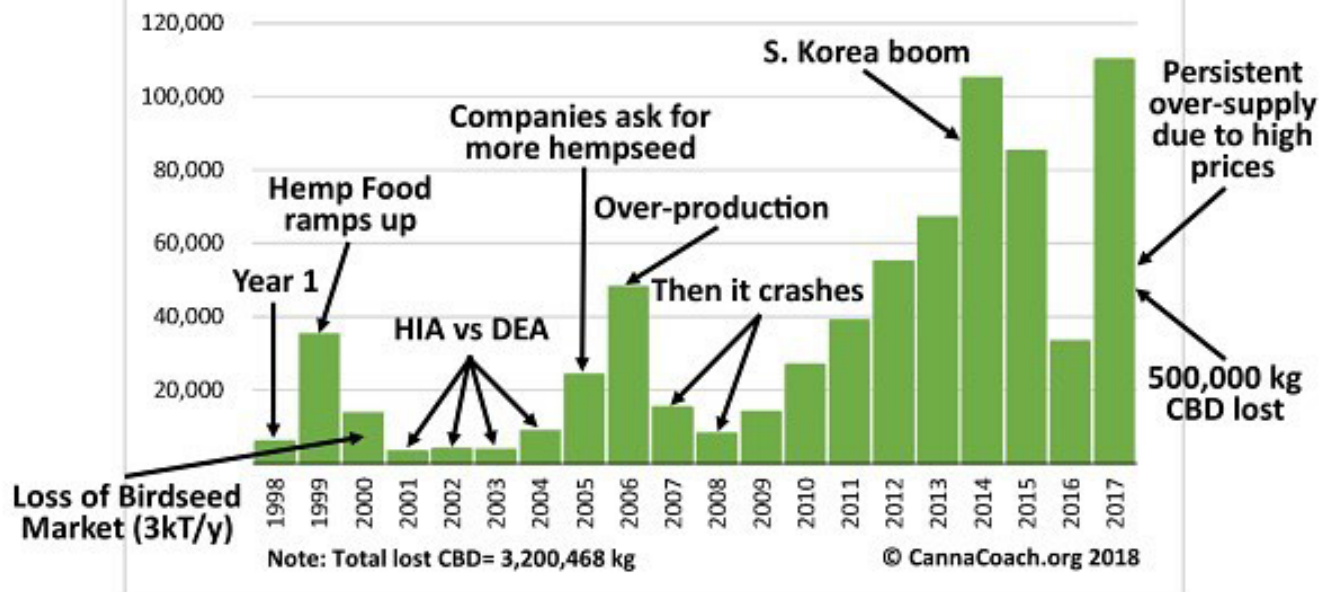


NOT TESTED
ON ANIMALS



Canada's ups and downs: 1998–2017

(Acres of hemp grown)



acres), while 681 commercial growing licenses were handed out, according to Health Canada figures.

Asia can still be export market

“The loss of that (South Korean) market hurts but it wasn’t the most profitable in any event,” CHTA’s Crawford noted. With shelled hemp seed trading for about Can\$9/kg (in small retail units) in the USA, the South Koreans were buying bulk shelled seed for about Can\$4 per kilogram from Canadian producers. Crawford said one South Korean buyer offered just Can\$2 per kilogram for bulk seeds recently.

“This is not the kind of business anyone is interested in pursuing,” Crawford said.

Still Crawford said he sees seed exports developing in other Asian countries – Thailand, Taiwan, Japan and even China. “Australia and New Zealand will also be strong buyers of Canadian seed now that it is a legal product there. They can and will grow seed in Australia in the future but they can’t grow it as well as Canadian farmers can. Europe will also be a future buyer of Canadian hemp seed and products.”

Turning attention to CBD

Despite the downturn in demand for seed from South Korea, Canadian Hemp is not licking its wounds but turning its attention to the much bigger opportunity in CBD as the market looks forward to changes anticipated under a proposed new licensing regime for industrial hemp growers.

Part of a broader Cannabis Act covering both marijuana and hemp, the new regulations would allow farmers to sell hemp flowers and leaves – parts of the plant required to process CBD which have heretofore been illegal to harvest in Canada. The CHTA, farmers and even Canadian doctors have pushed for clear rules on CBD, citing the sector’s economic potential and the promise the compound has shown in treating certain maladies. Most notable, Canadian hemp proponents point to the U.S. CBD market, where sales are predicted to reach \$2-3 billion over the next 4-5 years. U.S. CBD product sales in 2016 were estimated at just \$202 million, according to Hemp Biz Journal (USA).

Big players getting ready

Major players are already making moves in anticipation of Canadian marijuana and hemp rules changes. Ontario-based Canopy Growth, an incumbent licensed marijuana processor, recently announced the acquisition of Green Hemp Industries of Saskatchewan where it says it can eventually expand hemp fields to more than 2,000 acres. The company has said it will use an existing marijuana processing facility for CBD extraction.

Also, Australia-based Creso Pharma recently acquired Mernova Medicinal-Inc., Halifax, in anticipation of developing a cultivation facility where it will grow plants for its nutraceutical products. Creso seeks to position itself as a leader in CBD for human edibles as well as animal food supplements.

Despite the optimism, hemp stakeholders and observers say they still see a need to push for fundamental changes that will truly open up the CBD market.

First, the Act as now drafted would require licensed growers of hemp to gain additional permits to process and market CBD, limiting the sale of flowers and leaves to the 20 or so Canadian companies licensed to process and sell CBD – primarily those that are already processing medical marijuana in Canada.

Limiting sales to a select group of processors will constrain farmer-sellers and constitutes “an extreme regulatory burden,” Kim Shukla, CHTA’s executive director, recently told Marijuana Business Daily. “It’s important that farmers are able to sell their crops however they choose, and that is not possible under this proposal,” Shukla said.

‘Ongoing reviews’

Meanwhile the government already has made changes in the oversight of hemp to better align its regulation with the proven low public health and safety risk of the crop via a new Cannabis Act adopted at the end of last year; the Act notably moved federal oversight for hemp from the Controlled Drugs and Substances Act to the new Cannabis Act.

Rules changes also have eliminated the need for THC testing for most hemp crops and adjusted licensing renewal dates to align with product sales cycles.

Still, the government sees a need for further “reducing regulatory burdens for industry and streamlining processes.”

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Challenges ahead

Despite the CBD euphoria, USA Hemp faces many hurdles

As a CBD-fueled “hemp-horia” races through American farm towns desperate for economic stimulus, the more rational among us in The Land of the Free and Sedated still see major challenges ahead for the American hemp industry.

Let’s face it: We’re under State Control. Hemp should be treated as any other crop under federal and state laws. Our farmers should be free to grow it and sell it like the corn in Iowa or wheat in Kansas. Until that happens, and time is wasting, the American hemp industry will cede critical markets and sectors to more forward thinking, faster moving nations around the world.



John Rembold
HempToday
Americas

One need only look north to Canada to see the impact hemp can have on the agricultural economy. Despite Canadian Hemp’s ups and downs, stakeholders have built a full-fledged industry in a very short period of time.

In the turbulence of the U.S. market, entrepreneurs are forging ahead, more and more seed is going in the ground, while the consumer market continues fast-paced growth. Here’s an update on where we are with hemp in the USA.

THE SEED SCENE: Procuring high quality plant genetics tailored for local growing conditions continues to be a challenge. With U.S. hemp programs under federal control that prohibits moving planting seeds across state lines, low volumes available lead to high prices, according to National Hemp Association (NHA) Executive Director Erica McBride – an equation that affects many aspects of the industry. NHA says it is working to overcome delays in shipments of certified planting seed to avoid problems U.S. stakeholders suffered in past years when deliveries, in many cases, didn’t arrive until June.

Industry pioneers are pushing forward nonetheless. Colorado-based New West Genetics announced the first U.S.-bred hemp seed in early 2018. The new breed, called NWG Elite, is a dioe-

Land of the not-so-free

Despite the restrictions, hemp states grow as fields expand.



25,541

Acres of hemp grown in 19 states



32

Universities conducted research



1,456

State hemp licenses issued



www.VoteHemp.com

State	2017 Acres	2016 Acres
Colorado	9,700*	5,921
Hawaii	TBD	1
Indiana	5	2
Kentucky	3,100*	2,525
Maine	30*	1
Minnesota	1,205	51
Montana	542	0
Nebraska	1	1
Nevada	417	216
New York	2,000	30
North Carolina	965	0
North Dakota	3,020	70
Oregon	3,469	500
Pennsylvania	36	0
Tennessee	200	225
Vermont	575	180
Virginia	87	37
Washington	175	0
West Virginia	14	10
TOTAL	25,541	9,770

* Revised by Dept. of Ag. after initially reported

For more info: hempinfo@votehemp.com

scious strain primarily for large-scale grain production. It is the first U.S.-developed planting seed to be certified under standards of the Association of Official Seed Certifying Agencies (AOSCA).

Despite these advancements, high CBD certified seed strains remain impossible to find through official channels. “Everybody is asking for high CBD strains, none of which are registered yet in the EU,” said Hana Gabrielova, CEO at Hempoint, the vertically integrated Czech hemp company that is a certified seed broker. This leaves farmers in states with new hemp programs on the sidelines of the CBD game unless they want

to take the risk of bringing seeds or clones across state lines.

CHALLENGES TO CBD: A group of 28 lawmakers filed a court brief in early 2018 in support of the Hemp Industries Association’s lawsuit challenging the DEA rule on cannabis extracts, which was announced in January 2017. A decision in the case, *Hemp Industries Association v. Drug Enforcement Administration*, could come by the end of the year. A hearing in the case earlier this year came just days after Tennessee officials closed 23 stores that were selling CBD.

The legislators argued that in the 2014

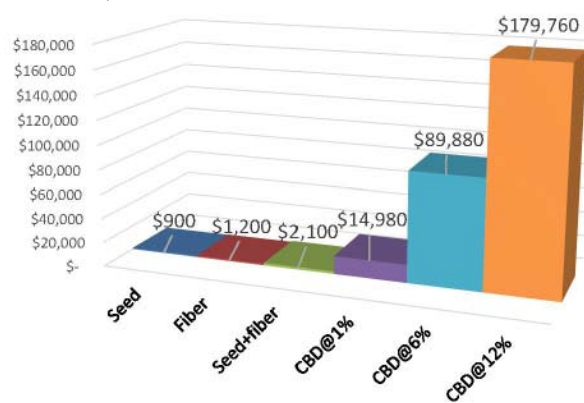
Farm Bill, “Congress recognized and acknowledged the need for research and development to investigate hemp-derived products, including CBD, and gave states broad discretion to create pilot programs to accomplish this research.” They called the DEA’s rule “inconsistent with the Farm Bill’s most fundamental purpose: to allow states . . . to experiment with commercial research and development of industrial hemp, including extracts and derivatives.”

CBD advocates have generally suggested a three-tier regulatory framework that places high doses of CBD in a medicinal, prescription-only category, but which frees CBD-laden products with lower percentages to be sold on the open market over the counter as food and health supplements.

WATER RIGHTS: Could hemp be the in foreground of emerging water wars? Anecdotal reports of growers in Colorado describe farmers taking up arms and joining patrols to prevent tampering with water valves. In the legislative arena, Gov. John Hickenlooper signed a bill in May of 2017 that protects hemp farmers who use federal water sources for their crops by recognizing industrial hemp as an agricultural product. However the U.S. Bureau of Reclamation,

Where’s the money?

Revenues per acre, Canada & USA combined: Seed, fiber, CBD



CannaCoach.org

the nation’s largest water supplier, doesn’t allow its resources to be used for hemp irrigation, and in other states growers report having their water turned off.

H.R. 4164, The Industrial Hemp Water Rights Act, aims to solve these problems and is currently under subcommittee review. Rep. Jared Polis, a Colorado Democrat, introduced the bill in Oct 2017. “Farmers deserve the freedom to use their water to grow industrial hemp, an age-old crop with boundless potential,” said Polis.

INTERNATIONAL DEALS:

As the US market begins to crack open, Canadian and Chinese firms are starting to make moves. Phivida Holdings of Vancouver, British Columbia recently inked a distribution deal with Green Reef Distribution, a Santa Monica, California based cannabis products distributor. Phivida’s CBD based food and drinks are hitting the shelves in 550 California dispensaries.

HMI Group of Beijing and Kings Royal Biotech of Capistrano Beach, California, broke ground earlier this year

on a CBD isolate extraction plant. The planned 50,000-sq-ft. facility will process hemp flowers for pharmaceutical products, fiber for clothing and seeds for food, said Keith Taylor of Kings Royal. The company projects it will employ 100 workers for a planned 1,000-acre hemp growing and processing operation in Carlisle and Hickman Counties in north-central Kentucky. Isolate Extraction Systems, Louisville, Colorado meanwhile already has 100 installations in 45 U.S. states.

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NORTH AMERICA

1 WISCONSIN

Growers hope to re-spark a hemp legacy

After a unanimous vote in the state senate in fall 2017, farmers in the U.S. state of Wisconsin – once America's most prolific hemp grower – can again cultivate the valuable crop. Initial enthusiasm is high as falling grain and dairy prices have left many state farmers looking for alternative crops.

"It's really exciting as a Wisconsin native to be back here and see hemp coming home to where it belongs," said Aaron Rydell of Colorado-based Salt Creek Hemp Co. Wisconsin was the No. 1 industrial hemp producer in the United States at times during the first half of the 20th century.

Rydell was on hand for a Wisconsin-hosted hemp industry conference that took a broader look at hemp's potential across the American Midwest. Crowds were large at that February 2018 event, and stakeholders also are crowding into Wisconsin Regional Farm Bureau events focused on hemp.

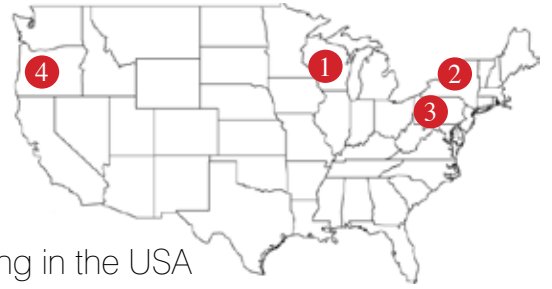
Wisconsin's interim hemp rules took effect March 2, 2018 and applications have started to roll in. The state Department of Agriculture, Trade and Consumer Protection (DATCP) has issued guidance to farmers to "secure seed/clones independently" while they wait for a seed importer license from the DEA. Many states require seeds to be imported from Canadian or European certified seed lists.

DATCP is accepting applications through May 1, with separate licenses for growers and processors, background checks, reporting requirements and other guidelines similar to those of state pilot programs around the country. One key statute allows a person without a license to possess, transport and sell industrial hemp that was processed by a person with a license, making it easier for processors and wholesale and retail operations to develop.

Worth noting: In what seems contradictory to the well thought out regulations, Wisconsin Attorney General Brad Schimel is blocking a tribe's application to produce CBD oil. Schimel is being sued by the St. Croix Chippewa tribe for overstepping his jurisdiction.

Hot SPOTS

Where hemp is happening in the USA



2 NEW YORK

State government gives good \$ignal

When it comes to hemp, the U.S. state of New York is putting its money where its mouth is. Having recently earmarked \$650,000 for a hemp processing plant near Binghamton in the south central part of the state, the government also set aside \$2 million in this year's budget for a state-run hemp seed certification program. Last summer saw the establishment of a \$5 million industrial hemp processing grant program for qualified projects related to hemp production.

"By expanding industrial hemp research, we are opening the doors to innovative ideas that could provide a major

boost to our farms and communities, creating new jobs, and laying the foundation for future economic growth," New York Gov. Andrew Cuomo has said.

New York more than tripled the number of farmers growing hemp last year to about 20; they planted 2,000 acres of the crop statewide.

The processing plant to be located in the Binghamton area, is at an estimated total cost of \$3.2 million.

New York's pilot industrial hemp program started in 2015, and in 2017 state officials lifted a cap on the number of participants.

3 PENNSYLVANIA

Expanded licensing draws 39 projects

Pennsylvania expanded hemp licensing this year, raising the number of total permits from 30 to 50 and drastically boosting the acreage individual farmers can use for hemp from 5 to 100. Thirty-nine licenses were eventually handed out.

Approved proposals under the state's pilot hemp program are for projects in 15 counties: Armstrong, Bedford, Berks, Bucks, Centre, Dauphin, Franklin, Lackawanna, Lehigh, Lycoming, Mifflin, Montour, Perry, Schuylkill and Westmoreland.

Meanwhile an effort is under way in the state to develop a national "center of excellence" to advance America's industrial hemp industry. Two Pennsylvania universities, Lehigh and Jefferson, along with the National Hemp Association (NHA) and the Pennsylvania Hemp Industry Council (PAHIC), both non-profits, are working on the project.

As part of the proposed multi-million

dollar initiative, the alliance has already received commitments from regional farmers in southeastern Pennsylvania to secure 3,000 acres for hemp farming to demonstrate the viability of a planned industrial hemp research park.

The center would carry out supply chain research and new product development while providing reference services to other stakeholders and investors. PAHIC and Lehigh partnered on three of the Pennsylvania hemp research projects last year.

Pennsylvania's pilot hemp program, signed into law in July 2016, is authorized by section 7606 of the Agricultural Act of 2014 (Farm Bill) and Pennsylvania's Industrial Hemp Research Act (Act 92), which was enacted in December 2016. The act allows for farmers to work with individuals and higher education to conduct research to grow, cultivate and/or market industrial hemp.

4 OREGON

Pushing industrial hemp forward on the Pacific coast

Despite taking a lead on marijuana legislation, Washington and California lag Oregon's progressive hemp regime. Oregon ranked third in the USA in acres planted in 2017. Licensing for growers, processors, and seed sellers is providing structure for each phase of production and eliminating legal gray areas. From seeds to storefront, Oregon is pushing the industry forward.

Late last year the state legislature passed the first state-level hemp health and safety laws related to labeling and testing.

All hemp products for human consumption must be tested for pesticides and contaminants. Additionally, CBD products will be required to display labels that guarantee their CBD content. The regulations came with hemp industry support, as out of state and foreign products were found to have high levels of pesticides.

Oregon's first CBD-only cannabis boutique opened in January 2018. The CBD Hemp Store offers pet treats, tinctures, edibles and extracts. A variety of brands and a more relaxed atmosphere cater to

a different consumer than a marijuana dispensary. Expect to see more retail outlets focused on CBD and hemp derived products popping up.

Brothers Seth and Eric Crawford, founders of Oregon CBD, are on the cutting edge of the seed market. Over the last three years, they've been breeding plants with very high ratios of CBD to THC, some as high as 30:1. Elektra, Lifter and Suver Haze are a few of their signature strains. According to their website, they ship to any state with an industrial hemp pilot program.



At-a-glance
Hoban Law Group

Top exec: Bob Hoban, Managing Partner

Headquarters: Denver, Colorado, USA

Employees: 40+

Intl. Offices: Latin America, Europe

Specialties: Cannabis law; marijuana, medical marijuana, industrial hemp-based derivatives and products

Notable: Led recent deal between Polish, U.S. partners to import certified seed.

Global Ambitions

HLG sees hemp opportunities in Latin America, Europe

Latin America offers the most opportunities for the global CBD sector based on brisk market demand and supportive governments, according to leading U.S. cannabis legal specialist Bob Hoban.

“The Latin American market loves cannabinoid extracts,” said Hoban, founder and Managing Partner at Hoban Law Group (HLG), Denver, Colorado, USA. Some Latin American governments are actively preparing rules and infrastructure to build up national hemp industries, Hoban added, with a goal to be major contributors in the global markets.

Supportive governments

“Many of the governments are supportive of widespread cultivation, processing, and use of hemp as a naturally occurring wellness product,” Hoban said of the Latin American consumer markets. “But they also have their eyes on the import and export markets,” Hoban said of hemp stakeholders in the region.

Extensive nationalized healthcare systems in Latin America also bode well for medical hemp, said Hoban, whose firm is establishing offices in the region – as well as in Europe – to facilitate international hemp deals and provide legal services. HLG not only brings its experience in high-level legal strategy to its international

operations, but also offers added value through its knowledge of industry players and consulting services covering a wide range of cannabis industry issues.

Europe advances

As European Union countries continue to evolve the CBD sector on the continent, a number of cannabinoid-rich products have been evaluated and approved under EU standards and are making inroads into the marketplace, Hoban noted.

And European countries are ripe to do international hemp deals. Hoban, for example, recently facilitated a deal between Poland’s Institute of Natural Fibers & Medicinal Plants and two U.S.-based hemp firms to import certified planting seed into the United States. The Polish Institute also will work with the U.S. companies — Colorado-based International Hemp Solutions (IHS) and Bija Hemp, an IHS-affiliated seed specialist — on cultivation research.

USA: Expect an ‘interruption’

A consultant to national governments, Hoban helped write Colorado’s medical marijuana laws in 2009, and serves as a member of the Colorado Department of Agriculture’s Industrial Hemp Advisory Committee. HLG brokered the USA’s first regulatory policy – in Colorado – for

cannabinoid-rich hemp derivatives for human consumption – a model that has drawn attention from other U.S. states and the federal government.

More broadly across the USA, however, Hoban sees an “interruption” in the cannabinoid extract marketplace before any real clarity.

Slow, tedious process

“The USDA (United States Department of Agriculture) and the FDA (Food and Drug Administration) need to step up and take the issue away from the Drug Enforcement Administration (DEA), which readily concedes that it has no jurisdiction over (U.S.) Farm Bill hemp and exempted plant material-based extracts and derivatives,” Hoban said. “This is a slow and tedious process which could take several years.”

Still he predicts that cannabinoid extract products will eventually take their place alongside FDA-approved cannabis based medicines, much like the pharmaceutical and nutraceutical model that exists for other healing plants.

As developments in other parts of the world continue apace, Hoban says that can only be positive for the United States. “We are witnessing the explosion of this cannabis-based economy outside of the U.S. This will, in theory, force the U.S. to come around on its archaic cannabis laws.”

Raising Haiti

IHBA's effort empowers locals to grow and build

With backing by the Finnish government, hands-on support of the Ireland-based International Hemp Building Association (IHBA) and supplies from Dutch firm HempFlax, “Mobil Ekol,” a traveling school that promotes hemp farming, processing and home-building in earthquake and flood-ravaged Haiti, is getting its first project off the ground, IHBA Director Steve Allin told HempToday.

“We hope to establish a showcase for a system with a variety of basic houses built with hemp,” said Allin, who has made several trips to the small Caribbean nation.

That effort is in collaboration with Finnish architect Ritva Laurila, who is helping to advance the initiative's first project – transforming the site of an old sisal rope factory north of Port au Prince into a center where basic concepts for environmental living will be demonstrated.

Matching needs and good will

Laurila, inspired after attending one of Allin's workshops in 2013, developed the idea to train young Haitians in hemp farming, processing and building with hempcrete materials, and to promote the concept across Haiti, one of the poorest nations in the western hemisphere, and which suffered a devastating earthquake in 2010, followed in 2016 by massive floods caused by Hurricane Matthew. The quake killed an estimated 160,000 people, leveled 250,000 homes and destroyed some 30,000 commercial buildings, while the 2016 floods decimated entire towns and villages, leaving more than 1,000 dead.

Laurila lived in Haiti off and on throughout the 1980's and 90's, eventually meeting Jacques Bartoli of the Haitian Resource Development Foundation (HRDF), a NGO that works on development projects in the country's rural areas. In 2010 she led a joint project that eventually put up ten wooden huts donated by a Swedish firm in the post-earthquake

relief effort. It was three years later that the architect met Allin at an IHBA workshop in Turku, Finland.

“It just so happened I'd previously written a piece in an IHBA newsletter about the earthquake in Haiti and how hempcrete could be a safer option in the future,” Allin said. Quickly enlisted to Laurila's project, he made an initial visit

developed house plans and learned about framing and infill techniques using bamboo and earth for construction. During one recent trip, Allin and a Haitian team of builders erected the framework and shuttering for Mobil Ekol's inaugural hempcrete building at the site north of Port au Prince, on land donated by the non-profit Haitian Athletic Association, a high-profile NGO headed by former soccer star and political prisoner Bobby Duval, a prominent human rights activist in Haiti.

HempFlax, Oude Pekala, Netherlands, got involved when Allin caught up with Director Oana Suicre at IHBA's 2016 symposium in Verona, Italy. The company donated a container of hurds which eventually made its way through the Haitian import bureaucracy, after being shipped from HempFlax in April, Allin said.

“The project got caught in a typical trick by a combination of the shipping company and customs, who delayed and obstructed the shipment day after day with one new ridiculous detail after another, or by refusing to answer the phone altogether,” Allin said. “It was delivered only after painful

‘extra taxes’ and storage fees were paid,” he said.

Materials tests prove successful

Getting started also required “prolonged negotiations” with Haitian officials regarding clay and lime samples collected locally and sent to Ireland for analysis, Allin said. Those trials were “very successful,” putting another key element in place for building projects to advance. “That bodes well for building with imported hempcrete to show real examples and give credibility to the idea,” Allin said.

Allin doesn't expect things to get much easier as the Mobil Ekol initiative moves along in Haiti's generally difficult environment. But despite the challenges of poverty and the obstacles of little national infrastructure, Allin notes the Haitian Agriculture Ministry's sustainable resources department is a strong supporter of the project.



“We hope to establish a showcase for a system with a variety of basic houses built with hemp.”



Steve Allin

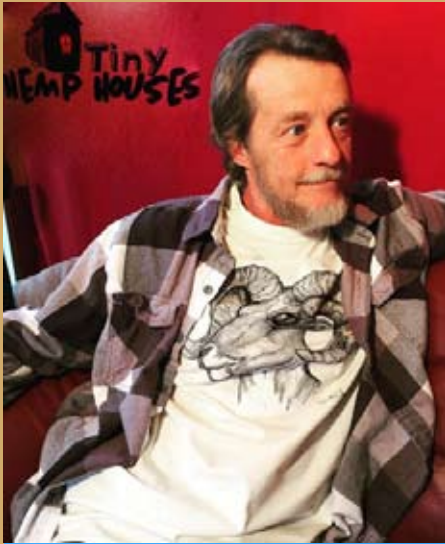
Founder & Director,
International Hemp
Building Association

to assess the situation on the ground in Haiti as she organized €30,000 in Finnish government startup funding for the project in cooperation with HRDF.

Rights activist donates property

Since that time Allin has returned to Haiti to conduct workshops in soil preparation and hemp sowing. His teams also have

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Self-Reliance Expo

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Monika Brümmer, Adrar Nouh Co-op, Morocco; and Cannabric, Granada

Crowdfunding success advances hemp project in Morocco's remote regions

After reaching a crowdfunding goal of €32,000, German and Moroccan partners are advancing on a retrofit and hemp-building project that demonstrates their economic development plans in Morocco's High Central Rif. The area is an historic hemp farming region.

The effort is the pilot for an initiative of German architect and natural builder Monika Brümmer of Cannabric, and Abdellatif Adebibe of the Moroccan Confederation of Associations for the Development of the Senhaja Rif Region, founders of the recently created cooperative Adrar Nouh. It is part of a long-term plan to improve living conditions in the Rif, and capitalize on the potential of the region's cannabis straw for socio-economic development while saving the traditional architecture of the region. The partners see benefits to education and tourism as well.

The cooperative extends their work into the production of a wider range of products.

Brümmer serves as president of the initiative; Adebibe is vice president. She is the founder and owner of Granada-



High in the Moroccan Rif: A traditional dwelling.

based Cannabric, a producer of pre-fabricated hemp bricks, building blocks and other construction materials.

13 funders pitch in. The crowdfunding campaign, on Vision Bakery, drew funding from 13 parties. The money will be used to retrofit about 80 sq. m traditional terraced structures which in the past served as family dwellings, shelter for livestock and other purposes.

"Because of very difficult access and lack of infrastructure in the region, building materials will mostly be collected from local farms, including hemp straw for building materials and 'shinti' (rye straw) for roofs, combining traditional and innovative

techniques," Brümmer said.

The construction site is in Fir Tagourth, a "douar" or smattering of tribal dwellings – a 10-hour drive into the mountains from Tangier. The tribes practice an agro-pastoral culture that embraces local cedar forests and the farming of an ancestral cannabis variety on 500-1,000 sq. meter family plots earlier farmed for whole resource utilization. Individual compounds are dispersed, meaning there are no villages. Drinking water and water for cannabis farming in the area is from natural springs and collected rain water.

'Amazing.' Looking to future expansion, the project partners already have installed a hemp decorticator in the upper mountains of the Rif near the construction site.

The group recently outrigged a rugged 4x4 vehicle to be able to access the remote project site. "The topography is very hilly; paved roads don't exist, and the last few hundred meters are only traversable by foot." Brümmer said. "But it's amazing, including a bridge formed by the two halves of a split cedar stem that ends up in an emblematic rock behind which appears the roof of the first house," Brümmer said.

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HUMANITARIAN

A Montessori school in Lahan, Nepal, built by SHIV last year.



A SHIV-built home



Dhiraj and Nivedita Shah co-founded Kathmandu-based SHIV.



Craniofacial center project in Janakpur, Nepal

Shelter, and Hope

Helping Nepal's downtrodden with local resources

Shah Hemp Inno-Ventures (SHIV) is coming off a year in which it completed three construction projects that will better the lives of less fortunate Nepalese.

The Kathmandu-based startup completed a single unit hempcrete-built home under financial backing from German firms HempConsult GmbH and Hempro Int. That was followed by the building of a Montessori school for about 23 students in Lahan, Nepal. Then, in September, SHIV wrapped up construction of an expansion for a medical facility in Janakpur, using locally sourced bamboo and wildcrop cannabis.

Much needed shelter

"This is the kind of gesture that says a lot about the companies and people working in today's hemp industry," Nivedita Shah, SHIV's co-founder said of the homebuilding project. "It will give a family much needed shelter," Mrs. Shah said of the Dusseldorf-based firms' contribution.

Some 600,000 houses and public buildings were destroyed in the 2015 massive

earthquake in Nepal, which left many Nepalese living in harsh conditions with little or no shelter. By using locally available raw materials and by employing local labor, SHIV is able to build the four-room dwellings for \$5,000 each.

"SHIV's work in Nepal is commendable. We feel a particular responsibility, and take a lot of satisfaction in supporting this initiative," said hemp veteran Daniel Kruse, a principle in HempConsult and Managing Director of sister firm Hempro. "We hope others will follow us in supporting Nivedita and Dhiraj in their important work to provide shelter and much needed public buildings to the victims of the 2015 earthquake."

Second hospital project

Part of a Janakpur orthopaedic hospital, the more recently completed facility is for a specialized craniofacial center. The addition is the second hempcrete-based project by SHIV at the hospital complex. The company completed a wing for a meeting hall and offices in 2016 with the help of

Steve Allin, Director of the International Hemp Building Association (IHBA).

SHIV used bamboo mesh as a false roof with hempcrete insulation in the project, said Dhiraj K. Shah, who is a co-founder of SHIV along with his wife Nivedita. Local women applied clay render to the walls, which were painted in lime. A mixture of cow dung, lime, clay are in the roof.

SHIV's fast startup

SHIV, launched in 2015, has quickly established itself in construction, hemp-oil based consumer products, and finished hemp-based textile accessories. The company works with local farmers, processors and manufacturers to deliver hemp products by exploiting Nepal's abundant "wild crop" — uncultivated, naturally occurring hemp fields — providing jobs and spurring local economic development in the poorer regions of Nepal.

Shah says SHIV will soon launch its own-brand binder and a companion line of shivs for construction, under the brand "SHIVcrete."

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