

2020 Industrial Hemp Conference

The University of Vermont Extension Northwest Crops & Soils Program and Vermont Agency of Agriculture, Food and Markets are hosting the 2nd Annual Industrial Hemp Conference on February 20, 2020.

The conference will include education and information sharing opportunities on industrial hemp including current research, basic agronomics, farmer experiences with growing hemp, harvest and post-harvest considerations, legalities of growing, marketing and economics. There are 22 presentations covering all aspects of growing hemp!

Thursday, February 20, 2020—9:00 a.m. to 5:00 p.m.

8:00 a.m. Registration and Exhibits open

[DoubleTree by Hilton, 870 Williston Rd, S. Burlington, VT](#)

Cost is \$100 per person, \$75 for online live broadcast

View conference website, go.uvm.edu/2020hempconference for updated information and to register online. Please register by 2/13/20. Questions? Call Susan at 802-524-6501, ext. 432.

Thank you to our Titanium level sponsors.



ORGANIC CBD

Block of rooms available at the DoubleTree by Hilton for 2/19/20 and 2/20/20. Rate \$122 plus tax per night. Online at <https://bit.ly/3342Qtn> to book a room or call 1-802-865-6600 and mention the conference.

To request a disability related accommodation to participate in this program, please contact Susan Brouillette at 802-524-6501 or 1-800-639-2130 by January 30, 2020 so we may assist.

DISCLAIMER: (a) Changes may be made to this agenda, including a change of room location. (b) Not all presentations may be available via the online live broadcast option. Schedule will be made available.

KEYNOTE SPEAKERS



Dr. Jay Noller is a recognized global leader in hemp research, leading

scientific discovery for more than four years in Oregon and all over the world. Regularly tapped to speak at major conferences and symposiums and for national and international governments on hemp and its potential research implications, Dr. Noller is well-regarded by many as one of the world's premier experts in hemp.

Sunsoil
CBD
founders
Alejandro



Bergad and Jacob Goldstein will share their story of how they came to be, from breeding their own seeds, to farming organically, to extracting naturally, and launching in national retailers during the lunch presentation.

Northwest Crops and Soils Team | 278 South Main St, Suite 2 | St. Albans, VT 05478

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www.uvm.edu/nwcrops

NORTHWEST CROPS & SOILS PROGRAM



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COLLEGE OF AGRICULTURE AND LIFE SCIENCES

AGENDA

2020 Industrial Hemp Conference

Time	Exhibitor Hall	Emerald 3	Emerald 1	Emerald 2
8:00 am - 9:00 am	Registration and visiting exhibitor tables			
9:00 am - 10:00 am	Welcome and Plenary Session— Dr. Jay Noller , Director, Global Hemp Innovation Center - Oregon State University			
10:00 am - 10:30 am	Time to visit exhibitors and move to sessions.			
Session 1 10:45 am - 11:30 am	Hemp Economics, Uncertainty and Risk — Jonathan Shepherd, University of Kentucky	Hemp 101— Scott Lewins and Taylor Ready-hough, UVM Plant & Soil Sciences	Looking Under the Hood of the Cannabis Plant— Dr. Gerry Berkowitz, UCONN	Hemp Agronomy: A Canadian Perspective from 20 Years of Growing — Jeff Kostuik, Hemp Genetics International
Session 2 11:45 am - 12:30 pm	Farmer Panel 1: Growing CBD Hemp for Direct-Sales — Kismet Farm, High Meadows Farm, and Sheepscot General Farm & Store	Hemp Disease in Kentucky: Grasping the Reality of Yield Loss— Dr. Nicole Gauthier, University of Kentucky	Production of Feminized Seed and Tetraploid Hemp— Lauren Kurtz, UCONN VT Seed Law— Erica Cummings, VAAFM	Taking Fiber and Grain Production to Scale in a Volatile Ag Landscape — Dr. Alyssa Collins, Penn State Research Farm
12:30 pm - 2:00 pm	LUNCH with presentation from 1:00-1:45 pm—We Found A Better Way: Sunsoil CBD , Alejandro Bergad and Jacob Goldstein			
Session 3 2:00 pm - 2:45 pm	Farmer Panel 2: Growing CBD Hemp for Bulk-Sales — Hanksville Hemp, Walnut Hill Farm, and Deer Flats Farm	An Overview of Hemp Fertility Practices in North Carolina— Dr. Michelle McGinnis, North Carolina Department of Agriculture and Consumer Services	Introduction to the Analytics of a Cannabis Laboratory— Dr. Scot Waring, eLucidations and Alicia Cannon, Shimadzu Scientific Instruments	Evaluating the Challenges and Possibilities of Multi-Purpose Hemp — Dr. Jennifer Gilbert-Jenkins, SUNY Morrisville
2:45 pm - 3:15 pm	Break and visiting Exhibitors			
Session 4 3:15 pm - 4:00 pm	Hemp Production from Start to Finish: Proven Practices and Theory— Andrew Bish, Bish Enterprises and Hemp Harvest Works	Effects of Nitrogen and Potassium Rates on Floral Hemp— Dr. Michelle McGinnis, North Carolina Department of Agriculture and Consumer Services	UVM Research Session— Heather Darby, UVM Extension	Critical Questions for the Successful Transition to Hemp Farming— Joe Veldon, Seven Leaf Genetics
Session 5 4:15 pm - 5:00 pm	Vermont Regulatory Requirements for Hemp Sampling and Testing— Mike DiTomasso and Robert Shipman, VAAFM	Hemp Market Outlook and Navigating the Supply Chain— Damon Hess, Phylos	Got Certified Organic Hemp?— Nicole Dehne and Brian Shevrin, Vermont Organic Farmers	Legalities of Growing Hemp— Andrew Subin and Tim Fair, Vermont Cannabis Solutions and Stephanie Smith, VAAFM

9:00 am—10:00 am—Welcome and Plenary Session— Dr. Jay Noller, Director, Global Hemp Innovation Center - Oregon State University. Dr. Noller is a recognized global leader in hemp research, leading scientific discovery for more than four years in Oregon and all over the world. Regularly tapped to speak at major conferences and symposiums and for national and international governments on hemp and its potential research implications, Dr. Noller is well-regarded by many as one of the world's premier experts in hemp.

10:00 am—10:30 am—Time to visit exhibitors and move to sessions.

Session 1—10:45 am - 11:30 am

Hemp Economics, Uncertainty and Risk —Jonathan Shepherd, University of Kentucky. Hemp producers are facing risk and uncertainty in the hemp industry as it continues to grow out of its infancy. This presentation will address the cost of production as well as the uncertainty and risk components growers and processors are currently facing. Hemp market outlook, as well as rules and regulations, will be addressed from producer/processor perspective.

Hemp 101—Scott Lewins and Taylor Readyhough, UVM Plant & Soil Sciences will share the basics of hemp production. Agricultural production of industrial hemp for food, fiber, and resins will be the main focus of the workshop. Focus on variety selection, planting strategies, fertility, weed control, pest management, and harvesting will be included for the various types of industrial hemp. Harvest management and post-harvest handling will also be covered.

Looking Under the Hood of the Cannabis Plant— Dr. Gerry Berkowitz, University of Connecticut, will share molecular studies of cannabinoid biosynthetic genes, transcription factors regulating trichome development and pathway gene expression, effects of plant hormones on the biosynthetic pathway, and rate-limitation to CBD/end-product production in female cannabis flowers. This presentation will take you into the inner-workings of a hemp plant!

Hemp Agronomy: A Canadian Perspective 20 Years of Growing—Jeff Kostuik, Hemp Genetics International. Jeff will provide listeners an introductory agronomy presentation that includes aspects of growing hemp for grain fiber and CBD. Drawing from his 21 years of research and practical experience farming along with his brother-in-law growing pedigreed crops on their 8,000 acre farm that includes canola, wheat, soybeans, and of course, hemp. Jeff will also cover harvest management and combine modifications to assist in successfully harvesting hemp grain.

Session 2—11:45 am - 12:30 pm

Farmer Panel 1—Growing CBD Hemp for Direct-Sales. Hear experiences from farmers from Kismet Farm in Rochester, VT, High Meadows Farm in Putney, VT, and Sheepscot General Farm & Store, in Whitefield, ME. More details under Speaker Biographies.

Hemp Disease in Kentucky: Grasping the Reality of Yield Loss—Dr. Nicole Gauthier, Extension Plant Pathologist at University of Kentucky. Hemp is susceptible to a wide range of diseases, despite common lore. Significant yield losses can occur, and some diseases are lethal. This session will present an overview of hemp diseases in Kentucky and the surrounding region. Alternative hosts will be discussed, as well as the potential for overwintering and cross infection within crop rotations.

Session 2—11:45 am - 12:30 pm, continued

Production of Feminized Seed and Tetraploid Hemp—Lauren Kurtz, University of Connecticut. This presentation will focus on results of research conducted focused on feminized seed production. The presentation will share information on timing and rate of silver thiosulfate to masculinize female plants. Cautions in regards to selfing during feminized seed production to maintain certified strains will be shared. Tetraploid hemp development will be discussed. **Vermont Seed Law—Cary Giguere and Erica Cummings of Vermont Agency of Agriculture, Food & Markets** will share information about seed regulation in Vermont as it applies to hemp, including registering to be a seed dealer and notable requirements and prospective ideas to protect the industry.

Taking Fiber and Grain Production to Scale in a Volatile Ag Landscape— Dr. Alyssa Collins, Director of Penn State Research Farm. As the dust settles following a 2019 season of nationally expanded hemp production after the 2018 Farm Bill, we have the opportunity to examine what worked, what didn't, and what changes can be made to ensure farmer and industry success moving forward. Join us for a discussion of lessons learned on the East Coast in the trenches of 2019, and identify strategies for the savvy farmer in an ever-changing market.

12:30 pm—2:00 pm

LUNCH with presentation (1:00-1:45pm) We Found A Better Way: Sunsoil CBD—Sunsoil CBD founders Alejandro Bergad and Jacob Goldstein want to disprove the notion that price determines quality and pioneer a different approach. They will share their story of how they came to be, from breeding their own seeds, to farming organically, to extracting naturally, and launching in national retailers like Vitamin Shoppe. They'll share their learnings from trials and tribulations at the farm as well as insights into what they see next for the hemp industry and community.

Session 3—2:00 pm - 2:45 pm

Farmer Panel 2—Growing CBD Hemp for Bulk-Sales. Hear experiences from farmers from Hanksville Hemp in Huntington, VT, Walnut Hill Farm in Pawlet, VT, and Deer Flats Farm in Pawlet, VT. More details under Speaker Biographies.

An Overview of Hemp Production in North Carolina, Successes, Failures, and Challenges—Dr. Michelle McGinnis of North Carolina Department of Agriculture and Consumer Services (NCDA) will share on-farm observations by NCDA Agronomists and North Carolina State University (NCSU) Extension Agents and Specialist over the past two years.

Introduction to the Analytics of a Cannabis Laboratory—Dr. Scot Waring of eLucidations and Alicia Cannon of Shimadzu Scientific Instruments. Although the analytical science used in the testing of cannabis may seem like magic, it can easily be broken down to the use of four analytical instruments. During this presentation, Alicia will discuss the testing procedures, instrument types and what exactly happens to your samples when they are sent to your local laboratory. Topics such as potency measurement, residual solvent analysis, heavy metal analysis and pesticide analysis will be covered in detail. Like other consumer goods, stakeholders are interested in ensuring that products adhere to basic safety guidelines. In medical and adult-use *Cannabis* markets, concerns exist that products may be tainted by pathogenic microbes. Products can be exposed to these microbes in a number of ways, which can lead to illness and death. Scot will discuss modern monitoring and analytical methods for detecting and identifying microbial contamination.

Session 3—2:00 pm—2:45 pm, continued

Evaluating the Challenges and Possibilities of Multi-Purpose Hemp —Dr. Jennifer Gilbert-Jenkins from State University of New York (SUNY) at Morrisville will discuss production practices that differ between single purpose (grain or fiber) hemp versus multi-purpose (grain-fiber, fiber-CBD, grain-fiber-CBD) hemp production practices. Data from the past 4 years of production will be presented as well as ideas for opportunities moving forward.

2:45 pm—3:15 pm—Break and visiting Exhibits

Session 4—3:15 pm—4:00 pm

Hemp Production From Start to Finish: Proven Practices and Theory—Andrew Bish , COO of Bish Enterprises and founder of Hemp Harvest Works. Hemp Harvest Works is a design, engineering, research, and sales firm to help solve the mechanical needs of hemp producers. They work to connect growers with custom harvesters and provide consulting services for growers and harvesters. Bish Enterprises are known for their harvest accessories and header adapters.

Effects of Nitrogen and Potassium Rates on Floral Hemp Production—Dr. Michelle McGinnis of North Carolina Department of Agriculture and Consumer Services. This presentation will focus on the results of a North Carolina fertility study implemented to evaluate nitrogen and potassium rates for floral hemp production at four locations. Both the nitrogen and potassium tests have nitrogen and potash rates, respectively, of 0, 50, 100, 150, and 200 lb/ac. Foliar tissue samples were collected to begin establishing nitrogen and potassium foliar sufficiency ranges. Floral tissue samples were collected for cannabinoid analysis and yields were collected. There will be a discussion on required fertility for hemp.

UVM Research Session—Dr. Heather Darby, UVM Extension Agronomist, Dr. Darby will provide an update on field research for growing hemp for fiber, grain, and CBD in Vermont. Research results will be reported on variety trials, planting dates, plant spacing, and fertility trials.

Critical Questions for the Successful Transition to Hemp Farming—Joe Veldon of Seven Leaf Genetics will share this presentation designed for the farmer who is interested in transitioning all or part of their farm over to hemp cultivation. We'll explain the questions to ask and why they're critical to a successful crop. We will explain all the considerations needed for deciding if converting is right for your farm, including genetics selection, land preparation, best grow practices, proper fertilization, testing & analytics to harvesting and the options available to sell your crop.

Session 5—4:15 pm—5:00 pm

Vermont Regulatory Requirements for Hemp Sampling and Testing—Mike DiTomasso and Robert Shipman from the Vermont Agency of Agriculture Food and Markets will discuss the pre-harvest hemp sampling protocol including requirements, best practices, and more. They will also talk about inspections and random sampling. Additionally, required testing, compliance, interpreting a COA and using a Certified Lab for COAs will be discussed.

Session 5—4:15 pm - 5:00 pm, continued

Hemp Market Outlook and Navigating the Supply Chain—Damon Hess Phyllos, VP of Business Development. Hemp will soon be the third largest U.S. agricultural crop, offering significant potential for farmers. Join Phyllos as they share knowledge on the hemp market, navigating the supply chain, mitigating risk, and how they're working to support the success of farmers from start to finish.

Got Certified Organic Hemp? —Nicole Dehne and Brian Shevrin with Vermont Organic Farmers. Thinking about getting your hemp or hemp product certified organic? Nicole and Brian will cover the basics of organic certification plus issues specific to hemp production that were observed during the 2019 growing season. This workshop will help you avoid pitfalls and prepare you for what to expect during the application and inspection process. Come learn about the benefits of marketing and growing your hemp as organic.

Legalities of Growing Hemp—Andrew Subin and Tim Fair, Vermont Cannabis Solutions (VCS) and Stephanie Smith, Vermont Agency of Agriculture, Food & Markets. Andrew Subin and Timothy Fair of VCS and Stephanie of VAAFM will discuss regulation of hemp production and processing in Vermont and federally. The discussion will include an explanation of the new USDA hemp cultivation regulations and what they mean for Vermont's hemp program; our predictions about pending Food and Drug Administration regulation of CBD as a drug, dietary supplement, or food; interstate shipment of hemp following passage of the 2018 Farm Bill; and other "hot" regulatory matters. Vermont Cannabis Solutions supports hemp growers, cannabis processors, CBD oil product manufacturers, and CBD retailers throughout Vermont by staying on top of the rapidly changing laws and regulations, and by understanding the complex interplay of state and federal law in the cannabis sector.

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SPEAKER BIOGRAPHIES (listed alphabetically)



Our lunch time keynotes speakers **Alejandro Bergad** and **Jacob Goldstein** grew up together in Skyview Acres, a small progressive cooperative community in Rockland County, NY. In their early-adult years, both Alejandro and Jacob explored various entrepreneurial

endeavors each founding independent startups. Between the start of Green Mountain CBD in 2015 to the transition to Sunsoil CBD in February of 2019, Alejandro and Jacob have been involved in all functions of the organization. Aside from pioneering and scaling Sunsoil's extraction and farming methods, both have designed labels, assembled, packed and shipped product, built drying barns and greenhouses, hand harvested and more.

Dr. Gerald "Gerry" Berkowitz is a professor of plant molecular and cell biology in the Dept. Plant Science and Landscape Architecture at the University of Connecticut. Research (funded variously by NSF, USDA, and DOE) focus includes plant cell signal transduction and response to biotic stress, publishing over 100 refereed journal articles. He has served as Dept. Head at UConn and was Program Director at NSF for three years in the Biology Directorate. New to cannabis research, he has received funding from Connecticut MMJ grow facilities, cannabis venture capital firms, and has worked with dozens of undergraduates on cannabis research. He developed and co-taught a course on cannabis horticulture at UConn with nearly 400 student registrants. This course is offered online during the summer session.

Andrew Bish is the COO of Bish Enterprises and the founder of Hemp Harvest Works. He exited the retail management industry after 14 years, and rejoined the family business in 2012. Since 2015, he has been focusing on identifying and resolving the many issues currently facing hemp harvesting and processing. His goal is to provide equipment that helps standardize hemp farming practices while allowing growers to increase their scale of operation and decrease costs.

Alicia Cannon, Technical Support Scientist for Shimadzu Scientific Instruments, has traveled the country to aid in the setup of laboratories that cater to the regulated cannabis industry. In Vermont alone Alicia has worked with multiple processors, farmers and laboratories on their analytical needs.

Dr. Alyssa Collins is the director of Penn State's research farm in Lancaster County. She is a member of the PA Department of Agriculture Industrial Hemp Steering Committee and leads the Penn State Extension hemp education and outreach team. Along with colleagues, she has been participating in hemp production research in Pennsylvania since 2017. In 2019, she conducted fiber and grain trials in coordination with fourteen other Universities across the country.

Erica Cummings is a new addition to the Agency of Agriculture, starting in September of 2018, as the Agrichemical Research and Policy Specialist. Prior to joining the Agency Erica worked for UVM Extension Northwest Crops and Soils Program, for the past decade, on applied agronomy research trials. Erica is a Certified Crop Advisor, and has an extensive laboratory background. She has overseen the Cereal Grain Testing and Plant & Soil Laboratories at UVM.

Dr. Heather Darby is an Agronomist with UVM Extension. Heather developed the UVM Hemp Program in 2015. She has conducted research on industrial hemp including projects to identify best management practices for grain, fiber, and flower production. Heather also developed a strong outreach program that has allowed hemp stakeholders to network and receive education on hemp production. In 2019, she held the first UVM Hemp Conference that attracted over 500 attendees from throughout the country. Heather has also developed the first undergraduate hemp course for the UVM Plant and Soil Science Department.

Deer Flats Farm, Pawlet, VT—Mandy Hulett and her husband Rich. along with their two teenagers Julia (16) and Evan (15), own and operate two dairy farms and a trucking business in Pawlet, VT. Mandy is a 1998 Cornell graduate of Science with a heart for innovation and adventure. She and Rich attended the 2019 Industrial Hemp Conference to test the waters and pull the trigger on what would become a thrilling yet challenging growing season. They grew 60 acres of Oregon CBD Seed and Jupiter Seed strains of high-CBD, feminized hemp with many trials and tribulations along the way. They've contracted all of their 2019 biomass with a Western U.S. processor. The hemp is dried, milled, sifted, and extracted into distillate, isolate, or water soluble powder. Mandy and Rich are geared up for a second growing season in 2020.

Nicole Dehne is the Certification Director for Vermont Organic Farmers LLC. She began working for VOF in 2003, the year after the National Organic Program regulations went into effect. Since that time, Nicole has worked to represent the views of Vermont organic producers at the National Organic Standards Board meetings and as a member of the Accredited Certifiers Association. Nicole serves as the Chair Emeritus for the Organic Materials Review Institute board.

Mike DiTomasso is the Agricultural Resource Management Specialist for the Hemp Program. His work at the agency focuses on developing and implementing the inspectional program, as well as technical assistance and outreach to growers and processors. His experience is in agricultural production, and working with the agricultural community in various capacities.

Timothy Fair, Esq. is a founding partner of Vermont Cannabis Solutions, which was founded in 2018. He has been a vocal advocate for both cannabis and overall drug policy reform for most of his adult life. Since becoming an attorney in 2012, he has been fortunate enough to be part of the statewide movement to legalize cannabis in VT. Tim has spoken on the topic of Cannabis Law at numerous seminars and events across the country and recently helped design and teach Vermont's first continuing legal education course on Cannabis Business Law.

Dr. Nicole Gauthier is an Extension specialist in the Department of Plant Pathology at the University of Kentucky. She is responsible for outreach and research of hemp disease across the state. As part of her Extension duties, Dr. Gauthier provides growers with disease management recommendations including the identification, biology, and management of pathological organisms. Her publications range from traditional fact sheets to spray guides and social media updates – all of which are intended to provide growers and other professionals with quick disease management solutions. Dr. Gauthier earned her BS in Horticulture Science and her PhD in Plant Pathology from Louisiana State University. She also owned her own landscape business in Louisiana, in which she installed landscapes, irrigation, low voltage lighting, and water features. She joined the UK College of Agriculture in 2011. Grower information can be found on her [webpage KYHempDisease.com](http://webpage.KYHempDisease.com).

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SPEAKER BIOGRAPHIES, *continued*

Willie Gibson is a native Vermont farm boy, and graduated from the University of Vermont with a B.S. in Agriculture: Dairy Production in 1985. His 30-plus years of serving Vermont farmers as educator and consultant, include: 15 years with UVM Extension as County Agriculture Agent and Agronomy Specialist; 8 years with NOFA-VT as Dairy/Livestock Advisor; 4.5 years with Casella Organics working with residuals as soil amendments; and always available as independent consultant focusing on grazing, agronomy, soil health, and business planning. In 2019, Willie was recruited into a start-up Vermont hemp/CBD processing venture to be the Farmer Relations Coordinator and Agronomy Advisor for over 25 farmers and 1000 acres of plantings.

Cary Giguere joined Vermont Agency of Agriculture in the 1990s as a lab rat and achieved the position of Director of PHARM under dubious circumstances. In addition to stirring pots best left settled, he spends his days advancing responsible state and national agricultural policy that safeguards public health and protects the environment.

Dr. Jennifer Gilbert-Jenkins is Assistant Professor of Agriculture Science at SUNY Morrisville. She has been conducting hemp research since 2016 with a focus on agronomic practices for grain and fiber production.

Hanksville Hemp, Huntington, VT. Nat and Chris Weaver are twin brothers who started Hanksville Hemp LLC in November of 2018. They were first-time hemp growers in 2019, converting about 16 acres of old hay fields and cow pastures into irrigated, raised-bed hemp fields with around 20,000 plants. This was their first attempt at any type of row crop as their prior 30+ years of farming experience was related to home grown beef cows and hay production. They worked their way through every aspect of starting a hemp farming business in 2019... from securing a startup business loan all the way through a successful delivery of our harvest to a contracted CBD processor.

Damon Hess is Vice President of Business Development at Phylos. He has served on executive teams at a variety of startups from organic photovoltaics to water quality trading. Throughout his 25 years in global sales management, Damon has focused on commercializing intellectual property in emerging markets. Damon joined Phylos recognizing the tremendous potential for genomic breeding to significantly improve hemp yields after decades of prohibition. After completing his thesis on Chinese agrarian policy at Whittier College, Damon went on to earn his MS in Foreign Service from Georgetown University. He speaks Chinese, volunteers in youth sports, and commutes by bike religiously.

High Meadows Farm, Putney, VT. Howard Prussack started working on an organic vegetable farm in Putney in 1971, was running the farm two years later, and then in 1979 purchased the farm. He focused on vegetables, garlic, onions and eventually many greenhouses. Certified Organic hemp was first grown on High Meadows Farm two years ago with several dozen plants. Howard and his crew learned how to both grow and market the crop. Last year they started raising seedlings for sale to other growers and sold over 5,000 plants of feminized, top genetic strains. They also grew several hundred plants in the field. High

Meadows Farm markets direct to local processors and consumers, whole fresh plants, at the farm, and at the farmers market in Brattleboro. They developed a market for dried flowers through brokers and direct to consumers. They also do custom growing and field planting with their equipment for local growers.

Kismet Farm, Rochester, VT is a certified organic hemp and cut flower farm in Rochester VT. **Shawn Lenihan and Megan Payne** focus on regenerative farming practices, adopting techniques from biodynamics, natural Korean farming, and hugelkultur. It is our mission to be a closed-looped farm, using only locally harvested and wild foraged plants as our fertilizer and IPM inputs. They consider themselves microbe herders, focusing on growing diverse microbial communities to produce the highest quality flowers. Shawn Lenihan, M.Ed., is a formally trained scientist, acclaimed educator, hemp farmer, and cannabis enthusiast. For the past 20 years, Shawn has been involved in the cannabis industry, having worked for Vermont Patient Alliance in Montpelier, Philo Farm Medical in Mt. Shasta California, and currently at Kismet Farm in Rochester, VT. Lenihan has a deep passion and knowledge about living soils and continues to give talks around the state about regenerative cannabis agriculture.

Jeff Kostuik is the Director of Operations, Central Canada, US & International at Hemp Genetics International. Called upon for his knowledge gained from the farm along with his applied research background in the hemp industry, Jeff has an innate ability of relating with producers, colleagues and fellow professionals alike. Jeff is known for his 'real life' experience in the field. Equally renowned as having a strong applied research background providing bench marks in the hemp industry which has assisted in the success of producers and colleagues in the burgeoning hemp industry. In 2015, Jeff began a new career with Hemp Genetics International where he takes a lead role in sharing his agronomy knowledge to the HGI client base. Along with his work with HGI, Jeff is an enthusiastic hemp farmer working with his brother in law on the family farm producing pedigreed hemp seed.

Lauren Kurtz is pursuing a Master's degree in the Department of Plant Science and Landscape Architecture at the University of Connecticut. She is conducting hemp research under Dr. Jessica Lubell-Brand. Her projects include developing hemp tetraploids and assessing in-bred and outbred feminized seed populations. Lauren recently had an article published in Hemp Grower titled "USDA Needs to Lighten Up on 0.3% THC Limit in Legal Hemp Industry." Outside of her studies, she enjoys cooking and spending time with her boyfriend, dogs and cat.

Scott Lewins is an Entomology Extension Educator and Lecturer at UVM. Scott's background is in biological control of agricultural pests through enhancing native natural enemy communities, and his research focuses on the development of appropriate Integrated Pest Management tactics for northeastern growers. Together with Heather Darby, he also developed and taught an undergraduate course on Introduction to Hemp Production at UVM.

Dr. Michelle McGinnis, oversees the Agronomic Division Field Services Section within the North Carolina Department of Agriculture and Consumer Services. The Agronomic Division houses the soil testing, plant, waste, solution, and media analysis, and nematode assay labs. Field services is comprised of 13 regional agronomists who provide on-farm consultations specializing in soil fertility, plant nutrition, nutrient / waste management, and nematode management. Dr. McGinnis is currently collaborating with NC State University Extension researchers on a multi-location study to determine optimum nitrogen and potassium rates for hemp production. The project also allows for development of plant tissue sufficiency ranges for nitrogen and potassium and adjustment to current survey ranges of other nutrients in NC production systems.

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SPEAKER BIOGRAPHIES, *continued*

Our keynote speaker **Dr. Jay Noller** is a recognized global leader in hemp research, leading scientific discovery for more than four years in Oregon and all over the world. Regularly tapped to speak at major conferences and symposiums and for national and international governments on hemp and its potential research implications, Dr. Noller is well-regarded by many as one of the world's premier experts in hemp. With a Ph.D. in soil geomorphology, his broad research background includes seed production, soils and ecosystem services, small farms and community food systems, pest management, and various approaches to natural resource management. The diversity of his background as a professor of landscape pedology, with research involving the disciplines of soil science, geomorphology, art and archaeology has made him uniquely suited for leading research at the nation's largest and most comprehensive hemp research center. He has published more than 180 papers and maps, six books and has made contributions to many more works. He is also an internationally known soil artist creating large eco-artwork installations and fine-art paintings on display and in collections around the world.

Taylor Readyhough is a horticultural scientist with a background in controlled environment cannabis cultivation. He has worked to bridge the gap between the emerging cannabis industry and higher education since 2011. Taylor is currently the program instructor for Cannabis Plant Biology and Cannabis Science & Medicine at UVM. In addition, he is conducting various research projects at the university greenhouse facilities. His primary research interest is the cannabis microbiome and its influence on secondary metabolite production.

Sheepscot General Farm & Store, Whitefield, ME. Ben and Taryn Marcus have a family farm of 100 acres, with u-pick strawberries, mixed vegetables, maple syrup, apples, hay and in 2019 they added 3 acres of hemp. The hemp (for CBD) was incorporated into the farm's highly popular u-pick crops, with u-pick times tightly scheduled and advertised over their extensive social media footprint. They also own and run a very busy, community-based general store and cafe on the farm.

Jonathan Shepherd is a Farm Management Specialist currently working on his Ph.D. in Agricultural Economics at the University of Kentucky. In this capacity he assists farm owners with farm management decision-making, as well as Extension education programming. Recently, Jonathan has primarily been focusing on the economics and risk associated with hemp production. Prior to that, Jonathan worked with the Kentucky Farm Business Management Program as a Farm Management Specialist with UK. He currently sits on the Board of Directors of the Farm Financial Standards Council and is the Vice President of the Franklin County Farm Bureau. He also teaches undergraduate Farm Management Principles at UK. Jonathan holds a B.S. and M.S. in Agricultural Economics from the University of Kentucky.

Brian Shevrin is a certification specialist with Vermont Organic Farmers. Since 2018 Brian has been focused on helping hemp producers navigate the organic regulations. Prior to working for VOF, Brian worked at the Intervale Community Farm in Burlington, Vermont as well as other diversified organic farms in the state.

Bob Shipman is the Cannabis QC Program Compliance Specialist - a long title for: overseeing the certification of labs for Vermont Hemp testing. Bob has a B.S. in Chemistry from Hartwick College. His experience in environmental and forensic testing has prepared him for reviewing lab credentials with an eye towards ISO 17025.

Stephanie Smith is a Chief Policy Enforcement Officer at the Vermont Agency of Agriculture, Food & Markets, where she participates in the development and implementation of policies and programs supportive of the agricultural industry. Currently, Stephanie is focused on designing and implementing Vermont's Hemp Program and the Cannabis Quality Control Program. Prior to coming to the Agency, she worked for municipal government in a variety of capacities, including in the Municipal Assistance Center at the Vermont League of Cities and Towns. She holds a Bachelor of Arts in Environmental Studies from Boston University and a Master of Landscape Architecture from the Univer. of Georgia.

Andrew Subin, JD '92, is a founding partner of Vermont Cannabis Solutions, which was founded in 2018. He has practiced criminal defense, with an emphasis on cannabis defense, for over 25 years. Throughout his career, he has been a vocal advocate for cannabis law reform. In the early nineties, Mr. Subin was the first attorney in Washington State to employ medical necessity as a defense to charge of growing marijuana, representing a woman who was growing on behalf of a patient with severe glaucoma.

Joe Veldon, a Cannabis expert and long time cultivator of award winning cannabis. Co-founded and operates a breeder direct hemp seed company, Seven Leaf Genetics, in Vermont and offers consulting services to clients in 6 states. As well, he is currently producing high grade cannabis of medically significant cultivars with his partners, Lion Root Farm, for the recreational market in Oregon.

Walnut Hill Farm, Pawlet, VT. Rico Balzano and his wife Jill Perry Balzano own and operate Walnut Hill Farm with their two boys. They raise hemp, field crops, and heritage breed pigs. Rico is a Certified Crop Advisor (CCA) and has worked in agriculture for 19 years, including 8 years with UVM Extension and NRCS, where he specialized in no till planting systems, conservation tillage, and cover crops. Jill is a farmer and educator; she has grown organic vegetables and flowers and worked for several years as an English teacher. Jill currently manages all the marketing for Walnut Hill Farm, including eight weekly New York City Greenmarkets, and a collaborative pastured meat CSA. Jill and Rico grew hemp for the first time in 2019, learning a great deal about planting timing, density, and fertilizer requirements.

Dr. Scot Waring is Director of eLucidation, LLC, a VT-based, science, strategic advisory, and professional services firm for the *Cannabis* industry. Dr. Waring was completing a postdoc in 2015 at The Carolina Center for Genome Sciences at UNC Chapel Hill when he transitioned into the *Cannabis* industry after being hired as Lab Director by Steep Hill Labs. He setup/operated the company's laboratory in New Mexico to perform analytical and safety testing of *Cannabis* under that state's Medical Marijuana Program. He served as scientific advisor on several analytical, extraction, and refining projects before being hired by Champlain Valley Dispensary/Southern Vermont Wellness in 2016 as manager of the analytical testing and extraction programs. In 2018, Dr. Waring co-founded eLucidation, as there was a distinct need for advisory and professional services for hemp farmers, hemp growers, processors, analytical laboratories, and other ancillary businesses and stakeholders in the emerging industry. The motto "*Supply chain-focused. Equity-minded. Science-driven.*" reflects the guiding principles under which the company works with others. eLucidation's partners and clients include Northeast Hemp Commodities, VT Cannabis Solutions, The University of Vermont, UVM Extension, The Emerald Conference, iaso goods, and the Federal Public Defender's Office for the District of Vermont.

NORTHWEST CROPS & SOILS PROGRAM



CULTIVATING HEALTHY COMMUNITIES

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