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connection

19/20 ANNUAL REPORT

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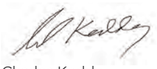
Message from the Chair

It is a special privilege to be Board chair of an organization whose sole purpose is to help the province's food sector grow. Perennia continues to connect those in the agri-food, seafood and food processing sectors with growth opportunities. Whether through advice, research, training, product development, testing or technology, our clients consistently find value when they connect with Perennia's specialists, services and programs.

This year began with exciting developments across all areas of the organization with many successes. Toward the end of the fiscal year, however, the world and the province were gripped with a pandemic that saw entire industries shut down, creating serious situations for citizens and companies. It is too early to understand the full impacts of COVID-19 on our economy, particularly the agricultural, seafood and food processing sectors. As we adjust to new practices and protocols to keep workers and customers safe, the landscape will no doubt look very different this time next year.

At a time when so much is changing, one constant is Perennia and its commitment to continue to support our agriculture, seafood and food processing industries.

I would like to thank all of our Board members, who once again showed how valuable their work is. They donated their time and expertise to guide Perennia in reaching its goals.



Charles Keddy
Chair, Perennia Food and Agriculture
Board of Directors

commit-
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Message from the CEO

Through its work, Perennia connects clients to new ideas, best practices, experts, new markets, research solutions, production support, information, programs and services. We work across the organization, providing clients with an interconnected ecosystem of programs and services. It is fitting that the theme of this year's annual report is "connecting."

There is interconnectedness between the earth and the sea and between what we eat and drink and those who create it. In the pages of this annual report, we have set out through stories and visuals to demonstrate the interconnected system where Perennia's work happens.

In 2019-20, a significant amount of work was undertaken with a vast array of clients in the agriculture and seafood industries. We have captured some of this work throughout this report.

And as always, we work collaboratively with the Nova Scotia departments of Agriculture, and Fisheries and Aquaculture and continue to be a key partner with the province in undertaking and implementing development projects for the seafood sector.

Connecting also adds a richness and a sense of meaning and fulfillment in our lives. This couldn't be more poignant as we all work to connect with customers, friends and family in different ways as a result of COVID-19. In March, while the global pandemic was creating confusion and chaos for individuals and industries around the world, including those which drive our economy here in Nova Scotia, staff kicked into high gear from home to help. They developed resources for essential food services impacted by COVID-19 to help everyone understand food and employee safety so they could continue to work safely while providing Nova Scotians with local food. We also begun a journey to support our valuable temporary foreign workers in successfully isolating so they could be there for industry.

The world as we know it is changing. Those in the agriculture, agri-food, seafood and food processing sectors help grow our economy, connecting people with jobs, customers with products and new markets with Nova Scotia harvests. Perennia will be here, making the connection with clients to understand, plan for and navigate our "new normal" to help ensure a resilient future.

Thank you to all team members for the hard work you do every day to help farmers, fishers and food processors in the province. I would also like to express my deepest thanks to our Board of Directors for all of their support and work this past year.

We are all in this together.

Lynne Godlien
CEO, Perennia Food and Agriculture

Our Vision

Nova Scotia is a recognized world leader in producing innovative, environmentally responsible, safe food of impeccable quality.

Our Values

01

Passion

for the industries we work in, the success of clients and the success of Perennia so we can continue to add more value to Nova Scotia's economy

02

Independence

of thought and direction, to provide objective advice to clients and industries

03

Proactive Leadership

to anticipate client needs, to bring new opportunities to sectors, to be unafraid to step up and work with industry to make tough but necessary changes for the future

04

Curiosity and Learning

to have a thirst for knowledge and sharing that knowledge, to be problem solvers, to encourage both in industry and our clients

05

Integrity and Accountability

to make commitments where our word means something, where we don't take on more than we can do well to meet our goals

06

Green Focus

to make the small and big changes as a company to lessen our environmental footprint and support best practices in this area for clients

Our Mission

Supporting growth, transformation and economic development in Nova Scotia's agriculture, seafood, and food and beverage sectors.

Our Board

Charles Keddy, CO Keddy Farms (Chair)
Noel Despres, Comeau Seafood (Vice-Chair)
Milton Wood, Oxford Frozen Foods
Victor Outlon, WG Oulton & Sons Ltd
Bill Hay, Trucorp Investments Limited
Real Samson, Premium Seafoods (until January 2020)
Margie Lamb, Meadowbrook Meat Market
Lori Kennedy, Louisbourg Seafood
Leo Muise, Seafood Alliance

01

QUALITY

IS CONNECTING CLIENTS TO NEW MARKET OPPORTUNITIES BY DEVELOPING AND INTRODUCING THIRD-PARTY VERIFIED QUALITY STANDARDS.

An essential part of any industry are the standards put in place to ensure quality. These standards are the guidelines or specifications that can be used to ensure that products, processes and services meet their intended purpose and remain consistent for the consumer.

To further strengthen the seafood and agriculture industries, our team spent the past year working on defining and determining quality standards for the lobster, farmed oyster and wine industries. By developing and introducing third-party verified quality standards, we were able to connect clients to new market opportunities and support the growth of these industries in Nova Scotia and beyond.

FARMED OYSTER STANDARDS
Quality standard connects local oyster farms to global market

The world is literally Nova Scotia's oyster. Each year, Nova Scotia produces about $3 million worth of farmed oysters. In a project supported by the Province, Perennia led the development of a quality standard for farmed oysters to provide a pathway for premium Nova Scotia oysters to be identified in the market.

Finalized in the summer of 2019, Perennia's quality and food safety specialists began implementing the standard and conducting audits for companies looking to trademark their products with the Nova Scotia Seafood brand. The quality standard and criteria were created by reviewing international research and working closely with local oyster farmers to determine their best and current practices and identify what could be improved.

Ashley Sprague, a Seafood Development Specialist at Perennia, says the Nova Scotia Seafood brand will help companies market their exports.

"Products branded with the Nova Scotia Seafood logo will represent consistent, top quality seafood for buyers and consumers," said Ashley. "If companies can meet the criteria, you know that they've gone above and beyond to bring the best products to market."

Ashley said the quality standard could lead to a higher value placed on oysters from the province. "We want to share this standard with the industry and encourage them to use the brand," she said. "This is a way of raising the bar for all companies in Nova Scotia – we really want to show that our province is producing some of the best seafood in the global market."

Bill & Stanley Oyster Company Ltd. is the first company to pass the audit. Owner Brian Fortune said he's looking forward to using the Nova Scotia Seafood brand.

"Nova Scotia has built an international reputation for having some of the highest quality seafood available in the world and this reputation has taken years to build," he said. "The additional quality assurances offered by this trademark will give us a solid foundation to export superior and consistent quality oysters to destinations throughout the world."

Companies interested in participating can complete a self-assessment checklist at nsseafood.com

"THIS IS A WAY OF RAISING THE BAR FOR ALL COMPANIES IN NOVA SCOTIA – WE REALLY WANT TO SHOW THAT OUR PROVINCE IS PRODUCING SOME OF THE BEST SEAFOOD IN THE GLOBAL MARKET."

Ashley Sprague,
Seafood Development Specialist,
Perennia

FROZEN LOBSTER STANDARDS
Nova Scotian tradition with quality in mind

Prized for its hard-shell and full meat qualities, Nova Scotia lobster is harvested from the cold, clean, pristine waters by thousands of independent harvesters and shipped all over the world. Lobster is Nova Scotia's biggest export with growing demand. This past year, Perennia worked with the Province and industry to develop a quality standard to ensure excellence for frozen lobster.

Since many factors can impact lobster quality, Perennia specialists developed the standard criteria by reviewing international research and conducting in-depth industry consultations to identify best practices for handling, holding and processing lobster.

Working with local processors to develop the criteria was key and ensures the standards are achievable for local processors but will also help raise the bar for the overall quality of Nova Scotia's frozen lobster on a global scale.

Companies that pass an on-site audit showing they are meeting all quality criteria in the standard will be approved to use the provincial seafood logo on their products. The Nova Scotia Seafood trademark conveys to consumers around the world that seafood bearing the trademark embodies the highest of quality standards.

WINE STANDARDS
Great wines bursting with excellence

Champagne, Bordeaux, Burgundy, Sherry and Port. These are all regions around the world with a specific wine appellation, and now Nova Scotia has created a distinctly Nova Scotian standard for all wines made from 100 percent Nova Scotia grapes.

As Perennia's Wine Sector Development Specialist, Kyla Pierik was part of the team that led the quality wine standards project for Nova Scotia. This was a collaborative effort between the Nova Scotia Department of Agriculture, Acadia University, the Winery Association of Nova Scotia, the Grape Growers Association of Nova Scotia, the Nova Scotia Liquor Corporation and other industry members. Kyla said developing these standards for the province will create new opportunities for wineries by showcasing wine that meets a certain standard on an international level.

"The standards are based on an international recognition of quality," said Kyla. "If someone in another country sees Nova Scotia wine with the quality mark on it, they would immediately know that it would be a rigorously tested, high-quality product."

There were two components to the work that was completed: the development of a Quality Wine Standard; and the system to implement the standard. The standard is a technical document created by a standards development committee made up of winemakers and grape growers in the province. Creating the system involved recommendations for a plan, including lab analysis, sensory evaluation, collection of data and the proposed creation of a Wine Authority to administer the process.

The project was led by internationally recognized wine consultant Peter Gamble, who conducted the research and background documentation required to ensure that the Nova Scotia Quality Wine Standard would be consistent and, in some cases, exceed national and international requirements for a top tier quality wine standard.

Jean-Benoit Deslauriers is Head Winemaker at the award-winning Benjamin Bridge Winery in Gaspereau Valley. Jean-Benoit was a member of the standards development committee for the project and said developing a quality wine standard is in the best interest of the industry.

"There's absolutely no doubt that great things can happen without standards, but having these standards can lead to excellence," said Jean-Benoit. "You know for certain that all measures were taken to ensure that the product is the best it can be."

Bruce Ewert is another award-winning winemaker and the founder of L'Acadie Vineyards, also located in Gaspereau Valley. Bruce was also a member of the committee. He said that creating quality wine standards is a major step for Nova Scotia as an emerging region.

"The standards we developed will have longevity and be a template for our region to grow in the right direction," said Bruce. "Because the standard is tailored for Nova Scotia and created by local wineries, we can continue to grow and become an important wine region in the world."

Stay tuned for the continued progression of the work as it leads Nova Scotia toward a quality wine standard that will be recognized worldwide.

WORLD LEADER

CREATING TOP SEAFOOD SPECIES QUALITY STANDARDS
An ambitious approach to enhancing Nova Scotia as a global leader

Nova Scotia is a world leader in seafood production and is known for its diverse range of high-quality seafood. Perennia is making waves to help seafood companies in the province grow their exports through the ambitious task of developing quality standards for the province's top 15 export seafood species with funding provided through the Atlantic Fisheries Fund. Initial planning for this project began in 2019 and will be completed and accessible to industry by late fall 2021.

The top 15 export seafood species that will see criteria for Nova Scotia are: Atlantic halibut, coldwater shrimp, haddock, Atlantic sea scallops, tuna, swordfish, snow crab, herring, silver hake, sea urchin, redfish, sea cucumber, mussels, Atlantic pollock and Atlantic salmon.

FATHOM FISH PROJECT
All boats rise

Fathom Fish & Seafood in Halifax is a seafood company focused on developing global markets for fish and seafood products harvested and processed in Atlantic Canada. After taking training with Perennia in 2019, they approached the team with an idea to provide their customers with the highest quality seafood possible. That meant working with all of their suppliers to develop, implement and maintain robust food safety programs in order to open up new international markets.

Fathom Fish believes the continuous improvement of food safety management systems will help ensure consumer confidence in the safe delivery of their products worldwide. Suppliers are jumping on board to collaborate with Fathom Fish and amp up the quality of and confidence in their products.

02

MARKET SAFE

IS ABOUT CONNECTING CLIENTS WITH GROWTH OPPORTUNITIES THROUGH TRAINING AND TESTING.

This year, Perennia continued to build sector and individual knowledge around food safety standards with training and scientific support to ensure safe food through the Agri-Food Accelerator Program and meeting the federal legal requirements for cannabis testing at Bloom Labs.

BLOOM LABS

Sweetening the pot for the cannabis market through safe products

Since cannabis was legalized in Canada on October 17, 2018, more than 100 licensed producers are now selling their products across the country. Under Canada's Cannabis Act, in order for any cannabis product to be sold, it must be tested to assure quality for consumers. Seeing an opportunity to support this new product, Perennia opened Bloom Labs in 2018. It is Nova Scotia's only Health Canada-licensed testing lab for licensed cannabis producers, micro-producers and recreational growers. Bloom Labs conducts mandated testing required for compliance under the law for both dried flowers and oils, a key connection between the growers and consumers.

"We saw an opportunity to ensure our clients not only met the mandated requirements, but to exceed their expectations and connect with them by providing a personalized approach from start to finish," said David James, Bloom Lab's Director. "We are able to work closely with clients and provide quick turnaround times because they aren't sending samples away to labs, they can actually drop them off to us and we'll get results back to them within two to six business days."

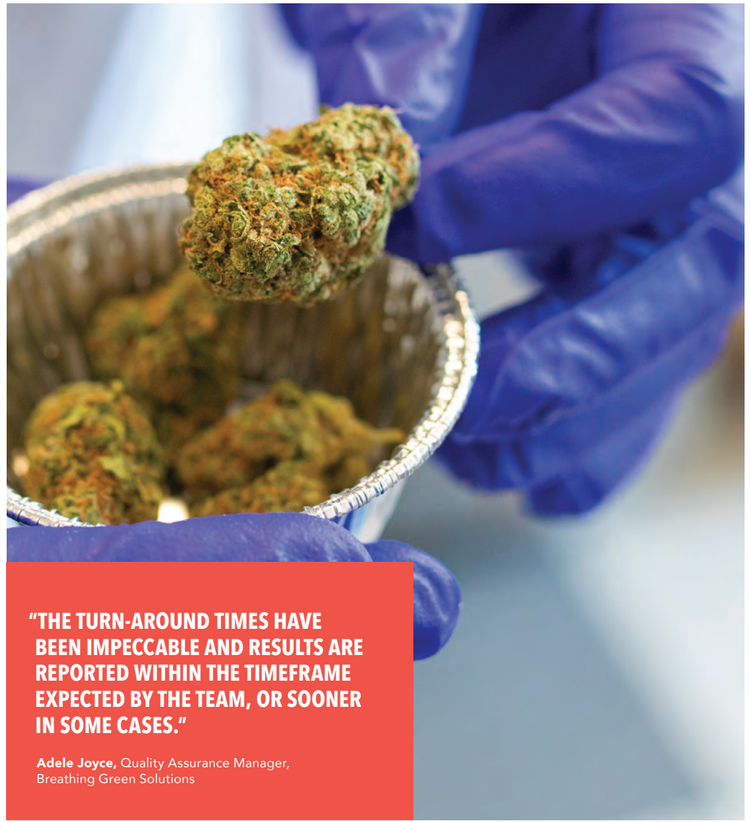
Having an approved testing facility locally means licensed producers get results back quicker and can sell their product right away as opposed to lengthy wait times from testing labs further away.

"Bloom Labs has been very accommodating and flexible as we ramp up company production and research. Their communication has been very transparent and professional," said Adele Joyce, Quality Assurance Manager at Breathing Green Solutions, a licensed producer in Wentworth Valley. "The turn-around times have been impeccable and results are reported within the timeframe expected by the team, or sooner in some cases. The team at Bloom Labs is working closely with our leadership, as well as with students and researchers, to help investigate important technical questions that impact product yields and quality."

The personalized approach allows clients to work directly with Bloom Labs to resolve any potential compliance issues before moving further into the testing process. "Our team delivers results follow-up to make sure our clients have all the information they need for retesting," said David.

This past year marked one full year of testing for both large and micro licensed producers and recreational growers. Already David estimates Bloom Labs has approximately 100 recreational grower customers, five large scale licensed producer clients and other licensed clients in Atlantic Canada and across Canada.

As legislation and regulations for cannabis edibles become clearer, David sees a budding future for Bloom Labs in research and development, with Perennia offering a full spectrum of services from product innovation, quality standards, compliance and testing.



"THE TURN-AROUND TIMES HAVE BEEN IMPECCABLE AND RESULTS ARE REPORTED WITHIN THE TIMEFRAME EXPECTED BY THE TEAM, OR SOONER IN SOME CASES."

Adele Joyce, Quality Assurance Manager, Breathing Green Solutions

SAFE4MARKET

Food safety resources connecting clients to new markets

There is no room for error when it comes to food safety. But it's hard to know where to start when developing and implementing a food safety program. Reviewing lengthy, complex food safety regulations and food safety standards can be difficult. Plus, determining which program is the best fit for your farm or operation can also lead to confusion. That's why Perennia created the Safe4Market series under its Agri-Food Accelerator Program. Safe4Market connects clients to new markets by enhancing food safety knowledge and skills.

Perennia's Quality and Food Safety team knows how to quickly connect clients with the information they need and how to appeal to all learning styles and preferences. They developed a comprehensive mix of in-person and virtual tools. These resources have landed well with clients who not only liked that they were easy to understand and user-friendly, but included articles, videos and interactive webinars.

The resources include five new fact sheets to add to the existing 10, three webinars, eight videos, a new section specific to COVID-19 and food safety and the Second Edition of the popular Safe4Market Guide on Quality and Food Safety for Agriculture Producers and Agri-Food and Beverage Processors. Two CanadaGAP workshops were also held as a part of the Safe4Market series, which helped participants become familiar with this internationally recognized program designed to help fresh produce operations implement and maintain good agricultural practices and food safety procedures.

SOME EXAMPLES OF THE RESOURCES UNDER SAFE4MARKET INCLUDE:

- The Importance of Choosing the Right Supplier (fact sheet)
- How to Collect a Water Sample (video)
- How to Do ATP Swabbing Using Hygiena SystemSure Plus and Ultra Snap Swabs (video)
- Getting into the Weeds: Food Safety Success (webinar)
- Take Your Product to Market: Food Safety Success (webinar)

All of these resources and more are available at **perennia.ca**

PRODUCTSAFE
From the ground up

While garlic is a staple in many kitchens, a Nova Scotia company is putting a twist on the traditional vegetable. Enjoyed for centuries in India and other Asian countries, black garlic is a delicacy known for its health benefits.

Black garlic requires careful aging and a complex array of chemical reactions, called the Maillard Reaction, under strictly regulated temperature and humidity. With a softer, molasses-like flavour, it is more subtle than the raw bulb. It also has added health benefits, including a higher number of antioxidants, than in its regular form.

Kings Head Garlic was founded by two foodies - one a caterer and the other in healthcare, both with a love of life and a passion for adventure. Together they were driven to build a productive, fun and healthy business.

Owners Jo-Anne Russell and Cori Bennet began looking at expansion through different offerings. To help them develop a process, validate the product and verify the final characteristics, they turned to Perennia for support through the ProductSAFE program. ProductSAFE is an offering under Perennia's Agri-food Accelerator Program.

Helping emerging, small and medium agriculture producers and commercial food and beverage processors address gaps and identify risks so they can be as successful as possible is at the heart of ProductSAFE. Through the program, clients can have formulations reviewed to make sure they meet regulatory requirements, processes evaluated to identify and remove safety risks, label verifications completed and regulations reviewed so they can connect with more markets.

Rick Kane is a Food Safety and Regulatory Specialist at Perennia and leads the ProductSafe program. He has worked with close to 100 companies and thousands of products each year to help ensure safety and compliance with provincial and federal food regulations. From conducting analysis on food to designing floor plans to avoid cross contamination, Rick helps businesses understand the science behind safety and saves them money and headaches in the process.

Additionally, Rick can help review facility designs to ensure proper air flow and provide insight in materials for proper floor and wall composition, develop Listeria control programs, evaluate sanitation and air quality with micro systems, review and evaluate wild crafted products and a wide array of international ethnic foods.

The duo at Kings Head Garlic took advantage of a number of these supports, also working with Perennia to evaluate the equipment that could run the process, ensure safety, develop labelling, create a nutritional facts table and review the facility floor plan for registration with the Nova Scotia Department of Environment's Food Safety and Enforcement Division. With Perennia's help, mass production of the black garlic is on the horizon as well as the development of other products such as jellies, garlic powder and garlic flavoured oils.

"Perennia provided knowledge and expertise that has brought Kings Head Garlic from a bulb of garlic to a Nova Scotia value added product," said Jo-Anne and Cori. "They have been invaluable and we would not be where we are today if it were not for their help. They are incredibly knowledgeable and more than willing to help with whatever we ask."

"We recognize the critical role agriculture plays in our region and have set out to help producers get to the next level," said Rick. "We connect them with resources, advice, science, research and innovation and ultimately new markets."

> "We connect them with resources, advice, science, research and innovation and ultimately new markets."
>
> **Rick Kane,** Food Safety and Regulatory Specialist, Perennia

FOOD SAFETY CERTIFICATION

PUBLIC TRAINING COURSES

INCREASED SESSIONS

Opening a world of new markets, accelerating sales and business growth

FOOD SAFETY TRAINING
Bringing the best close to home

Retailers are increasingly requesting food suppliers to have internationally recognized standards such as GFSI (Global Food Safety Initiative) certification. In many cases, having a certain certification opens a world of new markets, accelerating sales and business growth both locally and globally by ensuring confidence in the delivery of safer food products.

Perennia offers a number of public training courses each year, the majority offered under an exclusive partnership with NSF (formerly Guelph Food Technology Centre). Bringing this high quality, extensive suite of food safety training that spans every link from farm to fork, connects food growers and processors to required training close to home.

So, when the Nova Scotia Fisheries Sector Council was looking to develop and deliver a two-day Food Safety Awareness / HACCP training session that included Safe Food for Canadians regulations specific to the seafood industry, Perennia was its natural choice. Due to positive industry feedback and interest, what was originally intended to be four sessions between September and October, quickly increased to seven sessions throughout the fall and spring across the province with 119 attendees.

03

OPPORTUNITIES

IS MAKING SURE CLIENTS ARE CONNECTED TO NEW OPPORTUNITIES TO GROW.

One of our main goals at Perennia is to find new and different opportunities for our clients. This past year, we made it a priority to focus on connecting our clients to new markets for their current products. We spent time working with clients and stakeholders on new ways their by-products or waste could be repurposed through the creation of new products or entrance to new markets.

Through these opportunities, we were able to encourage creative new solutions and ideas and and put clients on the path to expanded streams of revenue.

PARTNERSHIP

LOBSTER BAIT CHALLENGE

Igniting innovation

In summer 2019, Perennia, the Atlantic Canada Opportunities Agency (ACOA) and Ignite Labs collaborated to launch the Lobster Bait Challenge. In an act to decrease the amount of herring and mackerel going into traditional bait products, contestants were asked to develop an alternative lobster bait using by-products from the groundfish processing industry. Nova Scotia produces millions of pounds of by-product from fish processing each year and about 70 percent of fish turn to waste.

Inspiration for the challenge came from Iceland where many fisheries aim to use 100 percent of their fish. Using groundfish by-product to develop an alternative lobster bait would create new opportunities for seafood processors in the province.

Marilyn O'Neil is a Seafood Development Officer at Perennia and helped come up with the Lobster Bait Challenge, but said the project was really a group effort.

"Members of the industry are a key part of what made this project work," said Marilyn. "Ignite and ACOA made this all come together and it's such a strong partnership.

Doug Jones is the CEO at Ignite Labs and worked with Perennia and ACOA to discuss opportunities to help the seafood industry.

"We quickly established that the utilization of species like mackerel and herring for lobster bait is not a sustainable model," said Doug. "We felt that pushing this out to the greater Atlantic Canada entrepreneurial network to see what people could come up with to help solve this challenge was the way to proceed."

In July and August, ideation workshops were held to coach potential contestants about the opportunity to connect with industry professionals and learn more about creating lobster bait.

"We had people from all parts of the industry help us host the session and about 40 people attended in person and even more watching online," said Marilyn. "It was a wildly successful turnout and a wonderful day for the fishing industry."

Following the workshop, top applicants pitched their product to judges and the top three finalists were chosen. The three finalists then had their product tested at sea. The ideal alternative lobster bait would meet market demand and be just as effective as traditional lobster bait.

Vince Stuart from Clare Machine Works was named the winner out of applicants from all over Atlantic Canada and took home a $30,000 prize. Vince continues to work on the bait device and his business has grown significantly. The two other finalists continue to pursue their ideas, and commercial opportunities are surfacing for each.

RASPBERRY AND GARLIC

Identifying opportunities to offset imports

Buying local has a significant impact on our rural economy and has never been more popular. As a result, when growers were looking to understand consumer and market trends in raspberries and garlic, they connected with Perennia.

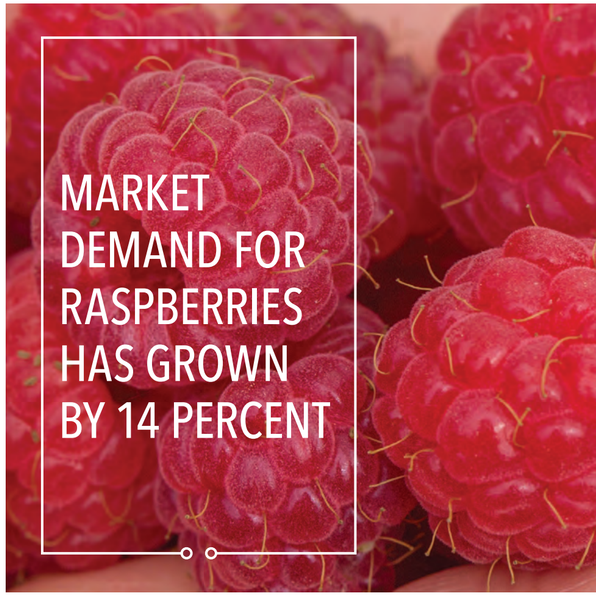
Starting with research into market trends, what they found yielded some fruitful results.

The research showed that the market demand for raspberries has grown by 14 percent since 2011, showing significant market potential. But because raspberries in Nova Scotia can only be grown during a four-week period, local raspberry retailers and distributors were looking for ways to increase the availability of local supply in the market.

Through their research, Perennia found a method developed in the Netherlands, and now used in Quebec and across much of Europe, that extended the growing period of raspberries by three months when tunnels/shelters were used. If used in Nova Scotia, the increased production has the potential to raise revenues for local raspberry farmers while significantly displacing imports.

Garlic is also an emergent commodity, but low production and import costs from China make it difficult for local growers to compete. Perennia's research found that if Nova Scotians purchase local garlic for an entire year, it would only cost consumers an additional $4 – a pricing perspective that could encourage more people to buy local.

Perennia hopes these promising findings will encourage local farmers to increase the production of raspberries and garlic so that Nova Scotians can have their pick of local products.



04

APPLIED RESEARCH

IS CONNECTING CLIENTS TO INNOVATIVE SOLUTIONS TO INDUSTRY CHALLENGES.

Perennia specialists and food scientists collaborate with clients and industry to develop new products, overcome challenges and ensure continuous improvement. This year, specialists worked with clients to find practical solutions in a variety of areas, including seafood, fruit trees, aquaculture, bee pollination, stopping the spread of disease in field crops and reducing the cost of production on dairy farms.

THINNING PROJECT
Improving fruit quality and size

Removing fruitlets from trees when they haven't reached maturity may seem counterintuitive, but that's exactly what apple growers do. Farmers use a common practice called "thinning" to control the number of apples produced on trees to improve fruit size and quality. Thinning can either be done by handpicking, which is extremely labour-intensive, or by applying thinning agents that encourage fruit to drop.

Recently, the Pest Management Regulatory Agency lowered the total allowable amount of a popular thinning agent so growers started looking for options to enhance the effectiveness of available products.

RESULTS SHOWED THAT MINERAL OIL WAS SUCCESSFUL IN ENHANCING THINNING AND INCREASING THE PROPORTION OF MARKETABLE APPLES

Perennia's Tree Fruit Specialist, Michelle Cortens, knew local farmers were interested in using mineral oil and found that research conducted outside of Nova Scotia showed its effectiveness in intensifying thinning. However, thinning is affected by weather and tree factors unique to production regions, meaning local research was needed.

Last year, Perennia started a two-year study funded by the Nova Scotia Fruit Growers' Association and the Crop and Livestock Management Trials Program (part of the Nova Scotia Department of Agriculture) to test the use of mineral oil with thinning agents in Nova Scotia.

After one year of testing at Birchleigh Farms Ltd. in Berwick, results showed that mineral oil was successful in enhancing thinning and increasing the proportion of marketable apples.

The results are so promising that after a second year of testing is completed, findings will be used to update recommendations in the local fruit thinning guide to aid local growers.

TERROIR INITIATIVE
Harvesting recommendations for industry

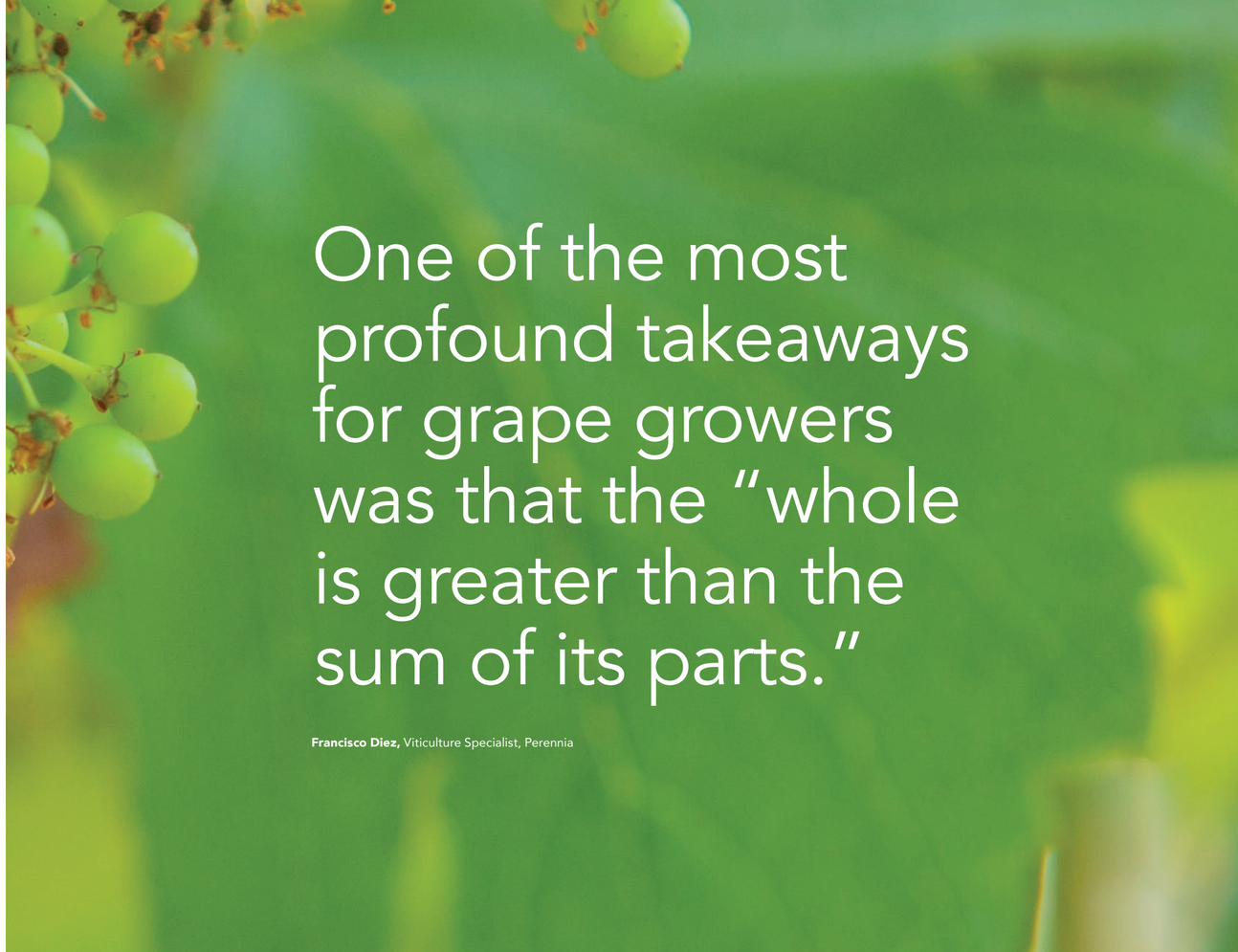
This past year marked the third and final year of the Terroir Initiative, a detailed and scientific research study for today's most represented grape varieties in the province, both *Vitis vinifera* and hybrids. In total, the initiative included eight varieties and 14 different vineyards. The overall goal was to help Nova Scotia's winemaking industry become more efficient, competitive and profitable by developing a protocol of sorts, utilizing the specific characteristics of the province's water, land and climate to produce the best possible grapes for exceptional local wine of international quality.

Perennia's Viticulture Specialist, Francisco Diez, said while weather negatively impacted the grape industry in two of the three years, the study yielded lots of learnings. One of the most profound takeaways for grape growers was that the "whole is greater than the sum of its parts." In other words, everything is connected – from pruning to weeds to soil nutrient management – changes to one will impact the other.

Francisco and grape growers were also able to reduce the veraison period by five days – the time when grapes turn from green to white or red. As a result, there is more time for the fruit to ripen, which results in more sugars, flavours, aromas and better overall quality of the wine characteristics.

"The three-year Terroir Initiative is a valuable foundational piece to help us not only improve the quality of our grapes and therefore wine, but to increase the financial and environmental sustainability of our industry," said Steve Ells, a director with the Grape Growers Association of Nova Scotia and an eighth generation farmer. "It has identified a number of issues we can work on to give us the opportunity to take the local wine industry to the next level."

Steve said the comprehensive study of numerous established vineyards in the province, with the international experience of the consultants and Francisco as project lead, has provided the industry with recommendations they can use in their vineyards. Some of the recommendations have already been put into practice and are having a positive effect on the health of the vines and quality of fruit. We'll toast to that!



One of the most profound takeaways for grape growers was that the "whole is greater than the sum of its parts."

Francisco Diez, Viticulture Specialist, Perennia

This prototype could connect clients in the seafood industry to new opportunities to maximize their business

LOBSTER PROTOTYPE

Developing potential game-changing technology

Since 2018, Perennia has been working on a provincially funded project to crack open a prototype that will easily determine how a lobster can be measured for the fullness of meat in its shell.

This project, which could have significant impacts for the local seafood industry, is one of many underway by the Department of Fisheries and Aquaculture to support and promote Nova Scotia seafood quality and standards, and decrease risks and unknowns for the lobster sector.

This prototype could connect clients in the seafood industry to new opportunities to maximize their business, because determining the percentage of meat in a lobster shell can help ensure a lively, high quality product reaches export markets and at premium prices for sellers. Companies would also be able to accurately market their product with a guaranteed percentage of meat.

Since the project began, Perennia has been working alongside members of the seafood industry and specialized engineering support to develop methods and test on-site at a processing facility. Research is still underway and will continue into 2020.

AQUACULTURE

Saving fish farms from storms with wave and wind modeling

Nova Scotians are no strangers to storms, but local fish farmers can be hit particularly hard when strong winds blow. When a storm hits, the cage arrays holding fish can get damaged and so can the fish. But what if farmers had wind and wave data to help them manage and prepare for storms on aquaculture sites?

The Province's Centre for Marine Applied Research (CMAR) at Perennia set out to answer that question with an exposure modeling project with the support of the Atlantic Fisheries Fund and finfish growers.

The research project started in 2019 and aims to model wind and wave occurrences at sites to predict the maximum wind and wave at that location.

Research is currently underway with two different types of wind and wave buoys collecting real-time wave data to validate modelling. With the data, CMAR plans to develop a web-based wave exposure atlas, so fish farmers can use science-based information to reduce the impact of storms on their farms. When the project is complete, farmers will be able to design cage arrays that can withstand maximum wind and wave events as well as identify aquaculture sites less affected by storms thus reducing damage, loss and lower profitability.

Research is currently underway with two different types of wind and wave buoys collecting real-time wave data to validate modelling.

CENTRE FOR MARINE APPLIED RESEARCH

ATTTA
Producing queens in the province

It's estimated that one-third of the human food supply depends on insect pollination - and blueberries are no exception. That's why Perennia is buzzing about its research into building the pollination capacity of honeybees for the wild blueberry industry through its Atlantic Tech Transfer Team for Apiculture (ATTTA).

Queen bees are important in increasing pollination capacity. Overwintering losses and the need to divide colonies to make more colonies available for early-season blueberry pollination mean local beekeepers often rely on purchasing queen bees from international sources in the spring, which comes with a swarm of risks such as importing disease, difficulty acclimating to the local environment and high costs of more than $40 per bee.

The demand for local queen bees led ATTTA to initiate a project in 2018 investigating the cost of production for beekeepers to produce their own queens. The past two summers, ATTTA evaluated hundreds of local colonies to select those with high-quality characteristics including but not limited to overwintering success, rapid spring build-up, good honey production and calm and gentle bees. Larvae from selected colonies were then grafted and used to produce new virgin queens for mating.

This project not only contributed to the first comprehensive study published on Canadian queen bee production costs but also identified solutions for local beekeepers to reduce costs and increase profitability. The study also encourages the local beekeepers to rear their own queen bees, which can add an additional revenue stream to their business.

Sounds like a honey of a deal, if you ask us.

DAIRY FARMERS
Coming together to save production costs

While sharing information with competitors might not seem like the best business decision, that's exactly what farmers in the Nova Scotia dairy industry did. The result? They lowered their production costs. Dan Mosley, Perennia's Dairy Specialist, started a project in 2019 to collect data on the production costs of 15 dairy farms with the goal of creating better returns.

The dairy farmers provide Dan with monthly data on the cost of feed, veterinary fees, wages, etc., as well as revenue from milk produced. The collective data is uploaded to a web-based program where key performance indicators – such as milk production (litres of milk produced) per cow, milk produced from forage and cost benchmarks – are shared with producers. The producers meet quarterly to discuss the data and find solutions to reducing costs.

One of the most significant costs for some producers was feed use per litre of milk. In using the data, some producers found that they were overfeeding. By addressing this issue, they saved between $80-$100 a month per cow on feed costs. Farmers were also able to see how they could reduce feed costs by using higher-quality forages identified by the program. Forages are one of the least expensive feeds already available on farms.

Dan is milking this project for all that it's worth this year, with ambitious plans to add data for overhead costs such as labour, power and machinery, which will help farmers find more cost-reducing opportunities.

FIELD CROPS
North American experts all ears on European Corn Borer resistance research in Nova Scotia

The European Corn Borer has been a common pest in Nova Scotia's corn production industry for years – but its recent resistance to a natural occurring, soil-borne bacteria used for insect control has led to unexpected damage to corn crops.

"We started using Bacillus thuringiensis (Bt) corn hybrids 20 years ago, which were genetically engineered to control the spread of the European Corn Borer," said Sonny Murray, Field Crop Specialist at Perennia. "Everything was going well until 2018 when we noticed unexpected damage to some of the corn crops." Test results confirmed that there was resistance in two areas of the province.

> This research is connecting Perennia to experts across the country

To date, there is resistance to one of the four Bt proteins used to control the European Corn Borer. "Resistance occurs as a natural evolution of the insect to survive, and we're perhaps on a path to full-blown resistance to all Bt proteins," said Sonny.

This threat makes Perennia's work in pest resistance mitigation more important now than ever.

"We use pheromone traps to attract the insects, then count and test the collections for resistance," said Sonny. "We also plant sentinel plots that express one of the Bt genes per hybrid and then complete pest control ratings in the fall to ensure they're still effectively controlling the pest."

Sonny explains that when comparing a hybrid with and without the Bt gene, the functioning Bt gene has a 12 percent yield advantage.

"Our work in resistance mitigation helps clients stay competitive in the global market with high yields and high-quality products. When you have control over the European Corn Borer you see better standability during harvest time," said Sonny. "On the other side of the coin, damage from the insect allows fungal pathogens into the corn plant, negatively impacting the grain quality."

This research is connecting Perennia to experts across the country, with findings and recommendations sent to the Canadian Corn Pest Coalition.

"Perennia has partnered with researchers here at Guelph specializing in resistance management for Bt corn on a multi-year project in response to this discovery," said Jocelyn Smith, Research Scientist at the University of Guelph. "This project will also connect transgenic corn and corn pest experts across Canada in both the public and private industry as members of the Canadian Corn Pest Coalition."

As this is the first case of Bt resistance globally, Sonny notes that there is a silver lining to the situation. "It's unfortunate that it had to happen here, but this has connected the Nova Scotian corn production industry with experts across North America."

05

KNOWLEDGE AND ADVICE

IS ABOUT SHARING WHAT WE KNOW. WHEN WE DON'T HAVE THE ANSWERS IT'S ABOUT CONNECTING CLIENTS WITH THOSE WHO DO.

Our team has immense knowledge and expertise to support clients in many areas related to their business operations. Through a variety of resources, both in person and online, we connected clients to information that would help them to grow and succeed.

As part of our long-standing Agriculture Production Extension Program, staff connected with clients during farm visits, calls, texts and emails as well as through field days, workshops and publications. This year, we also found alternative ways to share information through different platforms such as webinars and podcasts.

AGRICULTURE PRODUCTION EXTENSION PROGRAM

Helping farmers become more competitive

For more than 19 years, Perennia has been helping farmers expand their operations and overcome issues through the Agricultural Production Extension Program. The program offers one-on-one and group advice and information to eligible producers at no cost through support from the Province. The goal of the program is to help industry develop the skills and have access to the information that will lead to innovative, profitable and sustainable farming operations.

Through this program, producers are able to receive the guidance they need, whether it be through a quick phone call or text, or a development project with collaborative partners. Over the past year, Perennia has received thousands of requests for assistance through this program, with specialists helping producers with production recommendations, evaluation trials and consultations on a wide range of topics.

Perennia works alongside producers, commodity associations and government departments and agencies to help advance the industries in many ways, including profitable production and animal welfare. Not only does this program help producers grow, it also fosters connections and relationships between producers. Some producers have been a part of this program for more than 15 years and continue to come back to Perennia for their expertise. These relationships have become mutually beneficial for everyone involved, allowing mentorships to bloom and conversations about industry advancements, technology and trends to take place.

PLANT HEALTH LAB

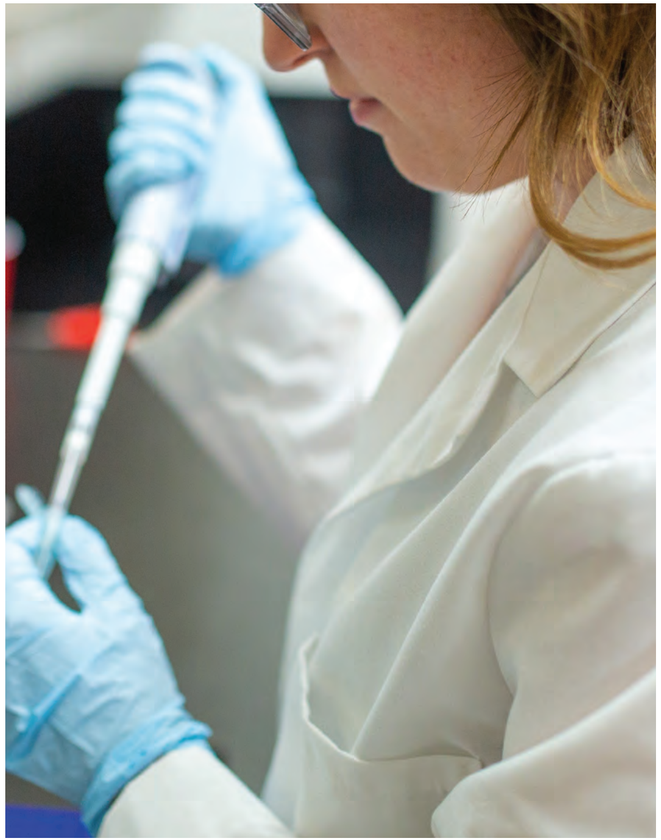
Healthy plants leading to healthy businesses

Healthy plants can often mean a healthy business for most farmers. Perennia works hard to help tackle plant and soil viruses that can be detrimental to even the strongest of businesses.

For many years, Perennia would visit fields to identify problems, take samples for virus and disease testing and ship them to labs across Canada for analysis. Although this would provide producers with the culprit, the process was time-consuming and didn't always provide the complete story.

That's why when the province sought to get a better handle on grape viruses in Nova Scotia, Perennia climbed all over the chance to establish the Plant Health Lab in 2018. The lab, located at the Kentville Horticulture Research Centre in partnership with Agriculture and Agri-Food Canada, currently has the capacity to test grape stems, strawberries and raspberries for viruses. In 2019, Perennia added a plant pathologist to the team, allowing it to offer a more complete diagnostic service to producers. The reduced degrees of separation allow producers the opportunity to work directly with Perennia experts in the lab and in the field. They can even have one-on-one conversations with those conducting the tests to gain greater insights on the virus.

Through Perennia's work at its Plant Health Lab, producers across Nova Scotia are quickly connected to their test results and mitigation strategies to support yield growth and profitability.



GREAT IDEA TO VIABLE BUSINESS

Getting products onto retail shelves with strategic guidance and resources

Many people have great ideas, but successful entrepreneurs transform those ideas into successful businesses by getting their product to market. For those in the food sector who have an idea or product but aren't sure of the next steps, Perennia is helping.

In 2019-20, Perennia offered two strategic initiatives under its Agri-Food Accelerator Program to help producers and processors get more products to market: the Take Your Product to Market webinar series and the Great Idea to Viable Business Booklet.

The Take Your Product to Market was a live webinar series covering a variety of topics including food safety, labelling regulations, retailer meetings and more.

"Shifting from an in-person to webinar format has allowed Perennia to branch out and connect with a wider audience," said Helen Arenburg, Project and Program Coordinator at Perennia. "We're now seeing a diverse group of participants, from food entrepreneurs, chefs, business development agencies and more, who share what they've learned with clients."

The webinars, which were hosted by Perennia specialists, guest speakers, and key partners Peter Chapman of SKUFood and Gary Morton of Morton Horticultural Associates, connected audiences with experts who share their tips and best practices in the field.

"Attendees have the flexibility to pick and choose between sessions based on what will help get their product to market successfully," said Emily Page, Food Scientist at Perennia. "The webinar is live, but is also recorded and uploaded to YouTube, so audiences can tune in at times most convenient for them."

In 2019-20, 226 attendees tuned in live to watch the Take Your Product to Market webinar series, with an additional 173 YouTube views.

"The program was designed so that we can use our knowledge to help participants make their business better," said Peter, a leading Canadian and international food retail consultant. "The food industry has so much potential, and we can realize the opportunities when we have solutions that appeal to consumers and customers."

In 2020-21, Perennia has plans for a new four-part webinar series based on The Great Idea to Viable Business Booklet, which was developed at the end of 2019 as a crash-course and self-paced document that contains step-by-step guidance along with charts, resources and checklists to help clients narrow down their ideas on the path to a viable business.

"The idea behind the booklet was a desire to outline a path of success," said Gary, a Nova Scotia-based business development specialist who authored the booklet. "I wanted to ensure people understood that instead of developing a product and trying to find someone to buy it, they should first determine what their customer wants and then create a product that aligns with their needs."

> "Shifting from an in-person to webinar format has allowed Perennia to branch out and connect with a wider audience"
>
> **Helen Arenburg,**
> Project and Program Coordinator, Perennia

AGRI-FOOD ACCELERATOR PROGRAM

GETTING INTO THE WEEDS

Keeping farmers informed

Nova Scotia has unpredictable weather, which makes it difficult to host in-person workshops during the winter months. This past year, Perennia held a series of workshops despite the weather – with a few changes, of course. Getting into the Weeds was launched via webinar, connecting attendees to the opportunity to learn about a variety of topics from the comfort of their own home.

The monthly workshops dove into topics such as winter greens production and food safety. And it got even further into the weeds with hard-to-find topics like financial information and containerized production.

Small Fruit Specialist, Jennifer Haverstock, said attendees had the opportunity to interact with guest speakers through the online platform. The webinar technology allowed attendees to listen to the speaker live and ask questions through a chat function. They could even watch the webinar again on Perennia's YouTube Channel.

Although winter storms might put a damper on some plans, it can't hold back learning at Perennia.

ORCHARD PODCAST

Bite-sized information on tree fruit production

Tree fruit farmers are busy people. From managing crops and soil, picking and sorting fruit to supervising employees and operating the business, it can be difficult to stay on top of rapidly evolving research. That's where the Orchard Outlook podcast comes in. In August of 2019, Perennia Tree Fruit Specialist Michelle Cortens began hosting the podcast that provides tangible, practical advice and information to help any grower navigate commercial tree fruit production. Each episode explores a new topic, including fruit maturity, disease that kills trees, flies that damages fruit and technology that can help growers advance their crops.

In every episode, Michelle is joined by expert guest speakers who offer additional insights thanks to their deep roots in fruit tree topics. The podcasts average 20 minutes, allowing growers to expand their knowledge while they work. Farmers can expect more podcasts to crop up, helping them navigate production and achieve sweet success.

The podcasts average 20 minutes, allowing growers to expand their knowledge while they work

THE POPULARITY AND SUCCESS OF THIS CONFERENCE LED THE MINISTER TO HOST THE 1ST ANNUAL AGRICULTURE MINISTER'S CONFERENCE THIS PAST YEAR, WITH PERENNIA AS THE CONFERENCE PLANNER

MINISTER'S CONFERENCES
Connecting attendees to industry trends and growth

For more than 22 years, the Minister of Fisheries and Aquaculture has hosted the Nova Scotia Department of Fisheries and Aquaculture Minister's Conference. Perennia has acted as the key event planner for the past three years. The conference connects hundreds of people in the industry with experts and guest speakers from around the world to discuss the latest industry trends and technology as well as new opportunities for growth and profits. The popularity and success of this conference led the Minister to host the 1st Annual Agriculture Minister's Conference this past year, with Perennia as the conference planner.

Both conferences revolved around the theme of quality, with subthemes in technology and innovation, automation, labour and marketing. Each year, the conference has a different theme to educate guests on new topics to help them expand their knowledge, their business and their profits.

While these conferences create new conversations about growing and improving both industries, they linked attendees to something even more beneficial – each other. During these conferences, guests met and networked with others in the industry, provincial ministers, experts, guest speakers and vendors. Many of the relationships forged at the conferences have led to long-lasting connections that help food processors become more profitable. This past year, each conference welcomed more than 700 people at the new convention centre in downtown Halifax.

NEWSLETTERS
Growing skills, growing crops

Having timely information is incredibly important when it comes to agriculture. The slightest change in weather or an unexpected disease in a region can destroy an entire field. That's why Perennia is dedicated to sharing up-to-date news, information and advice through its newsletters Orchard Outlook, CropLinks and The Root. These regular newsletters provide growers with information about upcoming weather, development stages, ongoing diseases and insect threats with management recommendations, on-farm technological advances and upcoming events of interest. Much of the information comes from field observations and research, allowing farmers to continuously improve their skills and make better decisions regarding their fields and crops. Specialists and research associates all contribute to make the newsletter relevant and timely.

Some newsletters have been published for over 60 years, a true testament to their value.

06

ACCELERATION

IS SUPPORTING AND CONNECTING BUSINESSES TO THE SERVICES THEY NEED TO GROW.

Through high quality and efficient mobile wine services, providing the required shelf life testing for products and offering small scale funding to address a food safety or product issue that is a barrier to growth, the Agri-Food and Seafood Accelerator Programs wrap their arms around clients to connect them with essential logistical, technical and scientific support.

EXPERT

AGRI-FOOD ACCELERATOR PROGRAM

Connecting producers with small funding amounts to address hurdles

Entrepreneurs are wired for growth, which means a lot of time and energy spent thinking about scaling up, accessing new markets, new products and commercialization. This might make the average person lose sleep, but small and medium-sized businesses in Nova Scotia's agriculture and food and beverage development sectors have an expert partner in Perennia.

Perennia's Agri-Food Accelerator Program connects developing companies in these sectors to specialized expertise and small funding amounts to help them grow through the phases of commercializing their product or entering new markets. The focus of this program is overcoming food safety and product development obstacles.

Funded under the Canadian Agricultural Partnership program, the Agri-Food Accelerator Program is a three-year program ending in 2021. This year alone, staff worked with more than 230 companies to address food safety issues and 45 companies to answer queries about product development, assist with technical obstacles or develop new products in categories such as confections, preserves, beverages, salad dressings and school snacks.

Open to eligible farmer and food and beverages processors, more information is available at **www.perennia.ca/agriculture/programs**

AGRI-FOOD ACCELERATOR PROGRAM

SEAFOOD ACCELERATOR PROGRAM

Swimming toward new product opportunities

In Nova Scotia, the sea is part of our DNA. The province is Canada's number one seafood exporter, accounting for more than 29 percent of the country's total national seafood exports in 2019. Connecting Nova Scotia's seafood producers to resources that bring new and innovative ideas to life is what Perennia's newest program is all about. Launched in 2019, the Seafood Accelerator Program is funded through the Province's Building Tomorrow Fund and provides businesses with the support and technical expertise needed to introduce new products, address technical challenges and expand into new international markets.

The program aims to strengthen Nova Scotia's seafood sector and has three key components: Seafood Market Access Program; Overcoming Technical Obstacles; and New Product Creator.

For more information on how to take advantage of this innovative program visit **www.perennia.ca/seafood**

PARTNER

SEAFOOD ACCELERATOR PROGRAM

Perennia is connecting Nova Scotians to opportunities closer to home

WE COME TO YOU

New mobile wine filtration system pairs perfectly with mobile botting service

Service delivery – mobile service delivery to be exact – was the inspiration behind Perennia's new mobile filtration service. Funded by the Province and ACOA, the service launched in February, connecting beverage companies to a local, high-quality, super-fast filtration service.

"The traditional wine filtration process can sometimes take several weeks," said Tyler Stewart, Perennia's Mobile Bottling and Filtration Services Lead. "But we can do it in a couple of days with our state-of-the-art, top-end Oenoflow Crossflow filtration system."

This tangential flow filtration system has capabilities to filter wine, sparkling wine and cider – all while maintaining the product's colour and aroma, which can sometimes be lost in traditional filtration methods.

Once the wine is filtered, Perennia's mobile bottling unit has all the necessary equipment to fill, cap or cork and label the wine.

"We bring this service to our client's doorstep, hooking up tanks to our mobile unit and providing our own equipment, pump, generator and maintenance to efficiently provide filtration and bottling services," said Tyler.

This service helps businesses allocate time and resources elsewhere, reducing labour costs with operating speeds of 1,500 bottles per hour. "As the demand grows for some wineries, they don't have the time, energy or resources to bottle by hand in-house," said Tyler. "They also may not have the means to put capital towards equipment and maintenance, which is where our services come in."

The services, combined with Perennia's knowledge and expertise, helps clients get their products to market faster. "The mobile filtration and bottling units are very efficient," said Jürg Stutz, Oenologist at Grand Pré Wines Ltd. "Wine is filtered, and can then be bottled, corked or screwed, labelled, put in boxes and it's done. Having this local filtration and bottling resource, technical know-how and expertise is indispensable."

By providing this service locally, Perennia is connecting Nova Scotians to opportunities closer to home. In addition to employing local staff, offering the service within the province allows for flexible schedules that meet client needs and help local wineries grow.

For Tyler, it's more than just efficiency and convenience. "I genuinely care about our clients' operations. At Perennia, we have that personal touch. Clients know they can pick up the phone and we can work together to get the job done or connect them with industry players and suppliers," said Tyler. "I have a great sense of pride when I walk through a store and see our clients' products."

AKSO MARINE

Shelf life testing helps clients get product into retail stores

Determining the shelf life of a food product is an integral step in getting products to market – something Marsha Grattan, Analytical Services Coordinator at Perennia, can help make happen.

"If a client wants to get their product onto retail shelves, they need to know how long their product will last," said Marsha. "A shelf life study helps determine the durable life of a product, better known as the best before date."

This supplies the documented evidence required to show retailers and regulators that the food will stay fresh, taste good, and retain its nutritional value, quality and safety until the end of the best before date.

As part of the shelf life testing process, Perennia advises clients on best before date testing and regulatory requirements specific to their product. "For example, if a client comes in and wants shelf life testing on a new gourmet sauce, they'll ask what tests are needed, how often they should be done, under what conditions and what the cost will be," said Marsha.

Perennia determines factors that will affect the product shelf life, such as ingredients, processing methods, packaging and distribution chains, along with any food safety risk factors. In addition to chemical and physical testing, Perennia uses internal sensory panels to replicate the consumer experience by evaluating products over time. "We offer affordable solutions for product development to understand factors such as durability, taste and the colour of products over time."

Perennia also has the equipment and expertise to perform accelerated shelf life testing, which can display early indicators of product deterioration by exposing a product to elevated temperatures or other abusive conditions. "This helps determine what a product will look like if there is a long transit time under adverse conditions, such as when the product is shipped by sea container before reaching the intended market," said Marsha.

Recently, Perennia helped develop dried sea cucumber capsules with AKSO Marine Biotech Inc. "Perennia helped us with our shelf life studies, nutrition analysis and quality control and assurance when modifying our bagged product into capsule format," said Guangling Jiao, Research and Development Manager at AKSO.

Clients making the transition from farmers' markets to grocery stores can also turn to Perennia to provide an estimated shelf life based on similar products and factors such as packaging. "Clients can then go back to the retailer and tell them the estimated shelf life and let them know that they've already started testing," said Marsha. "This connects clients to new opportunities by helping them get their foot in the door."

Whether clients are opening doors or getting their products onto shelves, Perennia has the know-how and tools to get it done.

"THIS CONNECTS CLIENTS TO NEW OPPORTUNITIES BY HELPING THEM GET THEIR FOOT IN THE DOOR."

Marsha Grattan,
Analytical Services Coordinator, Perennia

PILOT SCALE PROCESSING
A versatile service to meet versatile needs

The decision to grow the business is made, now what? Dozens of companies turn to Perennia's Pilot Plant at the Innovation Centre in Truro as a first and sometimes lasting step on their journey to test new processing processes and scale up product production plans. The Pilot Plant is available for processing food and beverages and non-food agri-bio products and has an assortment of pilot-scale processing equipment available that works for many food processes, including blending, cooking, drying, heat treatment, packaging, freezing and cooling.

Some clients use the Pilot Plant because they are making products at home and need to scale up. Others use it to test a piece of equipment before buying it and expanding their own shop. For some, it's to undertake initial testing and packaging so they have a real product to show clients and gauge their interest.

Yet others contract with Perennia to manufacture and package a product. That's the story behind Grand Pré Winery's famed Pomme d'Or Apple Cream Liqueur. They worked with Perennia to formulate the original recipe in 2015. In 2019, they used the stationary semi-automated piston-fired bottling equipment in the Pilot Plant to produce 5,000 bottles over two runs of its unique orchard-inspired liqueur.

Whoever the client, and whatever the reason – good things are made here.

PICKY PET
Going au naturel for dogs

Arielle Lewis knew she was on to something with her Picky Pet Natural Treats. Her dehydrated dog treats made with 100 percent Nova Scotian ingredients were a hit at the Cape Breton Farmers' Market and it was time to add new products and grow. Her current products include chicken feet, beef bites and beef lung – and dogs drool over them.

In order to meet the standards for distribution through a national grocery chain, Arielle approached Perennia to undertake a guaranteed analysis (Association of American Feed Controls Officials - AAFCO) and a GS1 barcode with new labelling.

"Perennia simplified the entire process," said Arielle. "I knew I had enough to do with running a business that I wasn't going to be the one testing the products. It was so nice to connect with experts who could handle all of the testing for me."

"IT WAS SO NICE TO CONNECT WITH EXPERTS WHO COULD HANDLE ALL OF THE TESTING FOR ME."

Arielle Lewis, Owner, Picky Pet Natural Treats

THE STATION
Putting Nova Scotia food products in public institutions

In 2018, Heather Lunan and Rebecca Tran founded The Station Food Hub, an agri-food, food and beverage hub with over 17,000 square feet of kitchen, refrigeration, storage, office and meeting spaces available to rent. Located in Newport the centre is strategically located only 20 minutes away from the richest agricultural landscape in Atlantic Canada, the Annapolis Valley.

The vision for the Hub is to have food producers, chefs, dietitians, manufacturers and other food industry experts use the space and potentially even collaborate on food that highlights the premium farming and fishing that Nova Scotia has to offer. Whether a new or experienced business, the Hub brings small and medium operators together to grow the local food system by connecting local producers to institutional and corporate buyers and by offering benefits in sourcing, processing and distributing products.

With extensive experience in food and nutrition, Heather and Rebecca also recognized the need for healthy, affordable food in Nova Scotia. When they launched the Hub, they also launched The Station Food Company, which is focused on getting more of the local food supply into public institutions as well as creating healthy snacks for school children.

In 2019, Nancy Tregunno and Emily Page, Food Scientists at Perennia, worked with The Station's founders to help bring two Nova Scotia wild blueberry-based snacks closer to commercialization. Heather and Rebecca created a blueberry apple sauce and a blueberry frozen pop. They leaned on Perennia to assist by identifying processing parameters for scaled-up production – exploring packaging options and developing the recipes so that the products could be widely produced when ready. And there's more work to do next year, as Perennia will complete the shelf life verification for the blueberry products, bringing them another step closer to market.

PERENNIA WILL COMPLETE THE SHELF LIFE VERIFICATION FOR THE BLUEBERRY PRODUCTS, BRINGING THEM ANOTHER STEP CLOSER TO MARKET

07

TECHNOLOGY

IS IDENTIFYING, INTRODUCING AND DEVELOPING THE LATEST TECHNOLOGY FOR EFFICIENT AND IMPROVED PRODUCTION.

Connecting farms and seafood companies with data gives them insights into what is happening in their operations so they can make better decisions. This year technology is helping farmers and seafood companies better understand the cost of production so they can find efficiencies, allowing researchers to track the amount of fruit that drops from trees and tracking coastal data to help protect aquaculture farms.

APPLE FRUITLET COUNTING APP

Efficiency to the core

We've all heard the saying "when life gives you lemons, make lemonade" … but what do you make when mother nature messes with your apples? You make an apple app.

"A tree naturally drops fruit, but never enough. This results in small apples and means growers have to reduce the number of fruitlets to give them space to develop," said Michelle Cortens, Perennia's Tree Fruit Specialist. "That's where thinning comes into play – one of the most important orchard practices that will improve fruit quality by intensifying a period of natural fruit drop."

During a thinning research trial, one person is usually situated in the tree to count fruitlets while another person stands nearby to record data on a clipboard. "It's very time consuming, and during two particular research trials, we were dealing with wet weather conditions and tighter timelines to count apple fruitlets and apply thinning treatments," said Michelle.

That's when she thought of the Orchard Tools app to reduce the work of four hands down to two. "I realized that if we could record data with a handheld, custom keyboard, the same person could count fruitlets in the tree and enter data," said Michelle. "This is made possible with large buttons positioned at the bottom of the screen which can be easily reached with your thumb."

During the research project, Perennia used the app to measure the fruit set by recording data on the number of fruitlets before thinning and again after thinning. At harvest, Research Associate Caitlin Congdon, brought the fruit to the lab to evaluate its quality. "That's when we added app features to record the percentage of fruit colour and size grade. All Caitlin had to do was press one button per characteristic," said Michelle.

The data can then be automatically exported into an Excel document for analysis, which saves time and prevents inaccuracies in data transfer.

"We're connecting growers with the technology they need to do their work efficiently. Growers identified a need for a handheld tool to speed up data entry, and this app is now under development for use in their orchards," said Michelle.

Peter Eisses, farmer and owner of Breezeway Acres is looking forward to the launch. "Having an application on your phone to record data will be incredibly convenient. Most of us carry a smartphone already, so having this app will help us utilize our technology even more."

Michelle said that conducting this research on a commercial farm helped her realize the positive impact the Orchard Tools app could have for growers. "We're helping to connect them with the opportunity to record, export and analyze data in one simple app – which ultimately improves thinning decisions and orchard practices in the future."

> "We're connecting growers with the technology they need to do their work efficiently."
>
> **Michelle Cortens,** Tree Fruit Specialist, Perennia

COST OF PRODUCTION

Using smart farm technology to reduce costs and environmental impacts

Manually tracking and entering detailed operating expenses on top of managing day-to-day operations can be time-consuming for agriculture, aquaculture and fisheries operations. Luckily, smart farm technology can help these companies make smart business decisions.

With the support of the province's Building Tomorrow Fund and Amazon Web Services, Grant MacDonald, Perennia's Executive Director of Software Development, and his team began development on an app this year to automatically track and share production costs with farmers and processors using cloud technology. This is done through internet-controlled smart sensors attached to electric power panels, water pipes, and more to track usage of things such as fuel, water and power, which then uploads data to Amazon's cloud service.

The goal is to have the information collected and readily accessible in clear reports and dashboards that are updated every few minutes, that alert users if something appears abnormal.

Currently, a majority of businesses can only track overall usage from invoices and aren't able to break down the details. This app will allow operators to understand the exact costs of production, such as the amount of fuel used to farm peas and the amount of electricity used by one machine, for example. This information will help develop efficiencies and reduce the overall cost of utilities.

This automated tracking process and detailed information will not only help companies reduce costs and save time but will also help them reduce environmental impacts.

> This app will allow operators to understand the exact costs of production

COASTAL MONITORING

Using ocean technology to grow aquaculture

The Nova Scotia aquaculture industry is valued at more than $88 million and directly employs 520 Nova Scotians with 149 companies farming seafood products. Perennia is collecting information to help aquaculture growers select suitable farming areas based on the conditions in which fish and shellfish thrive.

The Nova Scotia Department of Fisheries and Aquaculture set out to understand the environmental conditions on potential aquaculture sites specific to each species by deploying water quality sensors throughout the coastal waters of Nova Scotia.

The Province's Centre for Marine Applied Research (CMAR) at Perennia took over the Coastal Monitoring Program in 2017 collecting data on three essential environment conditions for fish and shellfish - temperature, salinity and dissolved oxygen levels - through the use of sensor string deployments.

"Sensor strings are submerged with a buoy and attached to the sea floor by an acoustic release, forming a straight line directly to the ocean floor. This allows data collection at various ocean depths," said CMAR Research Manager Leah Lewis-McCrea. "Once the strings are deployed, they are left to collect data over a designated time period."

CMAR continues to collect and share data through the distribution and monitoring of the sensors throughout Nova Scotia – located on coastal shores along the Annapolis Basin to Lennox Passage. They currently maintain and support over 40 sub-surface sensor strings.

This data is crucial to Nova Scotia's aquaculture industry. Aquaculture growers require detailed environmental data to determine suitable locations for farms based on the physiological requirements of the species being grown.

In addition to providing insight to prospective and current farmers for aquaculture sites, the information has relevance to global warming and fisheries management. Repeated deployments over a time series can be analyzed for fluctuations in temperature, which is useful in monitoring global warming. Information on temperature can also be used for fisheries management, since each species has a thermal range, they will need to migrate relative to thermal preference and food source.

The acoustic release equipment, provided by the Ocean Tracking Network (OTN), can also detect tagged marine life. As an added benefit, OTN uses this important data to track migration patterns of marine life, including endangered species.

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