



OFFICE of RESEARCH

AGRI-FOOD PARTNERSHIP

From Start-up to Scale-up

Gryphon's LAAIR Funding creates long term partnered research opportunities with Escarpment Labs

OMAFRA-UNIVERSITY OF GUELPH AGREEMENT CONSOLIDATED ANNUAL REPORT, 2019-20

CASE STUDY SUBMITTED PER REPORTING REQUIREMENT 3.4.6

AT A GLANCE

Focus of Case Study

Guelph-based company Escarpment Labs supplies a wide range of liquid yeast cultures for craft brewers and home brewers. The company has fueled its growth in the competitive craft brewing industry by continuing to partner with U of G's Dr. George van der Merwe to create new products that help them stay ahead of the competition. Escarpment Labs' focus on research helps them address industry-relevant concerns with a science-based approach. This helps the company develop trust with their clients and expand their customer base. The result is economic growth for the Guelph, Ontario economy, new jobs, and opportunities for U of G graduates.

Goal

The Gryphon's LAAIR (Leading to the Accelerated Adoption of Innovative Research) funding program provides gap funding so that researchers can turn their inventions into innovations that have economic impact. The funds are provided by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) via the Ontario Agri-Food Innovation Alliance and are used to accelerate the development of new products, processes and technologies which will benefit the Ontario agri-food and rural sectors.

Strategy

The Ontario agri-food sector is a \$37-billion industry that employs more than 800 000 people. To stay competitive internationally, the sector must develop and offer unique, hard-to-duplicate products. The Gryphon's LAAIR program helps Ontario researchers, industry and innovators create products and services that have local and international relevance. Specifically, several Escarpment Lab innovations have been made possible through Gryphon's LAAIR funding and a strong partnership with Dr. George van der Merwe.

Benefits to Agri-food

The Ontario Agri-Food Innovation Alliance administers the Gryphon's LAAIR innovation and commercialization programming. This program benefits the agri-food sector by establishing networks and collaborations with industry to accelerate the commercialization of research innovations, thereby bringing economic growth and development to the Ontario's agri-food sector. Specifically, the Escarpment Labs-Dr. George van der Merwe partnership will increase the profitability of several components in the craft brewing value chain. Breweries will continue to expand, and new breweries will be more established. In all instances these successes will generate more employment in Ontario's increasingly profitable beer sector.

BEHIND THE NUMBERS: ADVANCING KNOWLEDGE AND CAPACITY BUILDING

The Ontario craft beer industry plays an important role in Ontario's economy. Advancing knowledge and building capacity in this sector is critical to innovation, impact and the sector's continued success.

The specific strain of yeast used for beer production has a major impact on the style, taste, smell and look of the final product. As of 2015, there were no Ontario or Canadian suppliers of liquid beer yeast cultures for the craft beer-producing community in Ontario. Cultures were imported from the US at high costs with border control as an added complication.

In 2015, Escarpment Labs was created to fill this niche and meet the demand for unique, local and accessible liquid yeast cultures for Ontario breweries. Since its inception, Escarpment Labs company has partnered with

Dr. George van der Merwe to develop new products to help them stay ahead of the competition. This partnership is identifying novel yeast strains, including ones originating from Ontario that generate beers with interesting flavour and aroma profiles that are attractive to consumers. These yeast strains have expanded the local and microbrewery product range, which helps attract consumers in a competitive beer market. This long-term industry partnered research is providing brewers with high-quality yeast for optimal fermentation and has contributed to the growth and success of Escarpment Labs in the competitive craft brewing industry.

Since 2015, Escarpment Labs and Dr. van der Merwe have received funding from Gryphon's LAAIR to accelerate the development of new products, processes and technologies which will benefit the Ontario agri-food and rural sectors. Funded projects include:

- Creating a competitive advantage for Ontario craft beer through the use of novel regional yeast strains
- Applications of novel stress tolerant yeasts in commercial alcoholic fermentations
- Expanding sour beer production in Ontario
- Breeding stress tolerant beer yeast strains for enhanced fermentation capacity and product consistency

These projects and innovations have yielded multiple benefits, including capacity building in this growing sector. The health of this sector depends on a talent pool of skilled, forward-thinking learners. Escarpment Labs continuous to hire and train U of G students to grow its business. Hiring students means Gryphon's LAAIR funding has a dual impact: growing businesses and training the next generation of agri-food innovators.

Testimonial from University of Guelph Co-op Student, McKenna Tosh

"Co-op students make up the backbone of Escarpment Labs, as they are tasked with one of the most critical roles at the facility - handling the yeast! The university students are given some of the most important and crucial roles at Escarpment Labs. By having rotational staff performing critical roles, including yeast harvesting, it ensures that each new student is able to provide a new perspective on these important tasks and help them become as efficient as possible. Co-op students are also given multiple projects that align with their interests, which can include research projects or assisting with marketing and product development. Everyone at Escarpment is very welcoming and I felt like I was applying my university knowledge more, not only during my general everyday jobs but through the projects I completed. Since Escarpment Labs trusts its Co-op students with critical tasks and encourages them to make suggestions to improve processes, you feel like you're making a difference in the company."

-McKenna Tosh, former University of Guelph Co-op student who completed her work term at Escarpment Labs from April 2019 to December 2019. After her work term, Escarpment Labs hired McKenna back part-time as a Lab Assistant responsible for hybrid yeast strain development and assisting with the External Quality Control department.

Building partnerships through Alliance funding

The partnership between Escarpment Labs and Dr. George van der Merwe is well established and continues to advance knowledge and build capacity in the agri-food sector. However, not all industry-researcher relationships are this established and some need to be fostered. This is where the Alliance-funded Industry Liaison Manager position adds value. This position provides advisory services to University of Guelph faculty, staff and students who have been contacted by companies looking for scientific expertise, and manages enquiries that come into the University seeking research expertise. Assistance includes outlining the University's intellectual property policy, facilitating meetings and negotiations with external partners,

suggesting funding opportunities to defray costs, and even helping to review funding applications. As a result of inquiries to this unit, more than 60 projects worth \$10-million over two years have been expedited.

BEHIND THE NUMBERS: INFORMING DECISION MAKING

Testimonial from Richard Preiss, Co-Founder of Escarpment Labs



“We’ve been a part of three Gryphon’s LAAIR projects and there is a fourth on the way. These projects allow for our company [Escarpment Labs], to access some really bright minds at the University of Guelph that can help us to solve problems or learn more about what we are trying to do. We’ve been able to make use of these projects to develop and better understand yeast and help the brewers that we work with to make better beer, reduce their losses, and create a lot of value for the industry in Ontario and the rest of Canada. One example of how this partnership is informing decision making in our lab is the work that we are doing to expand sour beer production in Ontario” – Richard Preiss

Richard Preiss is the co-founder of Escarpment Labs. He is an active brewing scientist and member of the Master Brewers Association of the Americas and American Society of Brewing Chemists.

Expanding Sour Beer Production in Ontario

For industry partners and for researchers, the Gryphon’s LAAIR program helps to identify technologies that have market potential so that researchers and businesses can focus on developing winning products. Last year, through brewer feedback, Escarpment Labs identified limitations and challenges in sour beer production in Ontario. As a result, in 2019, an Escarpment Labs-Dr. George van der Merwe project was awarded Gryphon’s LAAIR funding to identify *Lactobacillus* strains with unique and desired flavour profiles. The project will also determine optimal fermentation temperature for a range of *Lactobacillus* strains and determine the optimal *Lactobacillus*-yeast fit for maximizing fermentation efficiency and flavour production.

Lactobacillus-mediated sour beers are now a significant segment of the craft beer sector and consumer interest in sour beers is growing substantially. The growth in popularity of these beers reflect changing palates among craft beer consumers, for whom delivering new and exciting flavours is always key. Perhaps more importantly, the popularity of sour beers can be attributed to shifting demographics of craft beer consumers who may represent a significant portion of the craft beer market in the future. Historically, craft beer has not been compelling to these demographics, but the emergence of sour beer is shifting this perception.

Given the substantial growth in sour beer interest and production, and that most sour beers on the market are produced using a lactic acid fermentation followed by a yeast alcoholic fermentation, Escarpment Laboratories has seen growth in their *Lactobacillus* products, with their *Lactobacillus* Blend now their third highest-selling product. However, there are still considerable opportunities to innovate within this space. Breweries still encounter frequent technical problems in producing these beers, and there is a desire for greater flavour diversity among these beers. If 50 per cent of breweries in Ontario are producing sour beers from only three or four common *Lactobacillus* strains, then there is not much opportunity for individual breweries to create distinct products and enhance competitiveness. The “Expanding Sour Beer Production in Ontario” project will yield new and cutting-edge products in the brewing *Lactobacillus* sector and help Ontario brewers to make new and exciting sour beers to meet the needs of growing demographics.

AGRI-FOOD SECTOR BENEFITS

The Numbers

- In 2017, the total economic impact of Ontario's craft beer industry was \$1.4 billion. The Ontario craft beer industry also contributes¹:
 - 200 operating breweries in Ontario
 - 2,200 jobs
 - \$150-million in annual tourism revenue
- Escarpment Labs and Dr. George van der Merwe research partnership has:
 - Received 4 Gryphon's LAAIR projects
 - Trained 20 HQP:
 - Seven co-op students at Escarpment Labs throughout the past three years and is looking to hire more as they expand.
 - Seven fourth-year research project students in George van der Merwe's lab
 - Two summer students in George van der Merwe's lab
 - Three grad students in George van der Merwe's lab
 - One post-doctoral fellow in George van der Merwe's lab
 - Supported one research technician in George van der Merwe's lab
 - Resulted in the development of 7 new yeast strains
 - Developed 1 ON-RP3 grant using findings supported by GLAAIR projects
- Escarpment Labs has:
 - 16 employees with plans to grow to 20 by the end of 2020
 - 7 full-time employees are U of G grads
 - A compound Annual Growth Rate (CAGR) between 40-50%
 - Given lectures at Dr. George van der Merwe's Mycology and Biotechnology courses to approximately 60 U of G students per year
- Since 2014, Gryphon's LAAIR has:
 - Funded more than 70 projects
 - Fostered partnerships with over 60 industry partners

¹Ontario Craft Brewers (2018). 2018 - Ontario Craft Brewers stimulate economies across the province - Whiteboard video. <https://www.youtube.com/watch?v=ZBTcVP5Fu98c>