

# Growing a Sustainable Agriculture Ecosystem through Partnerships at KPU

**Dr. Deepak Gupta**, Associate Vice President, Research, Innovation and Graduate Studies

**Dr. Deborah Henderson**, Director, Institute for Sustainable Horticulture

**Charlene Seward**, Indigenous Food Ways Community Outreach Facilitator, Institute for Sustainable Food Systems

**Dr. Paul Adams**, Scientific Director, Applied Genomics Centre

**Lindsay Dodds**, Lead R&D Researcher, CubicFarm Systems Corp.



Thursday, May 19 2022

# Territorial Acknowledgement

Kwantlen Polytechnic University (KPU) takes its name from the Kwantlen First Nation.

We work, study, and live in a region south of the Fraser River which overlaps with the unceded traditional and ancestral lands of the Kwantlen, Musqueam, Katzie, Semiahmoo, Tsawwassen, Qayqayt and Kwikwetlem peoples.

As visitors, we acknowledge and honour the Anishinaabe, Haudenosaunee and Lenape people as the traditional owners and custodians of the lands and waterways where Fanshawe College is located.

# KPU History

1981

- Kwantlen College formed after a split from Douglas College
- Surrey & Richmond campuses opens



1995

Becomes Kwantlen University College



2008

Institution becomes Kwantlen Polytechnic University



2019

Civic Plaza campus opens



2007

Cloverdale (now Tech) campus opens



1993

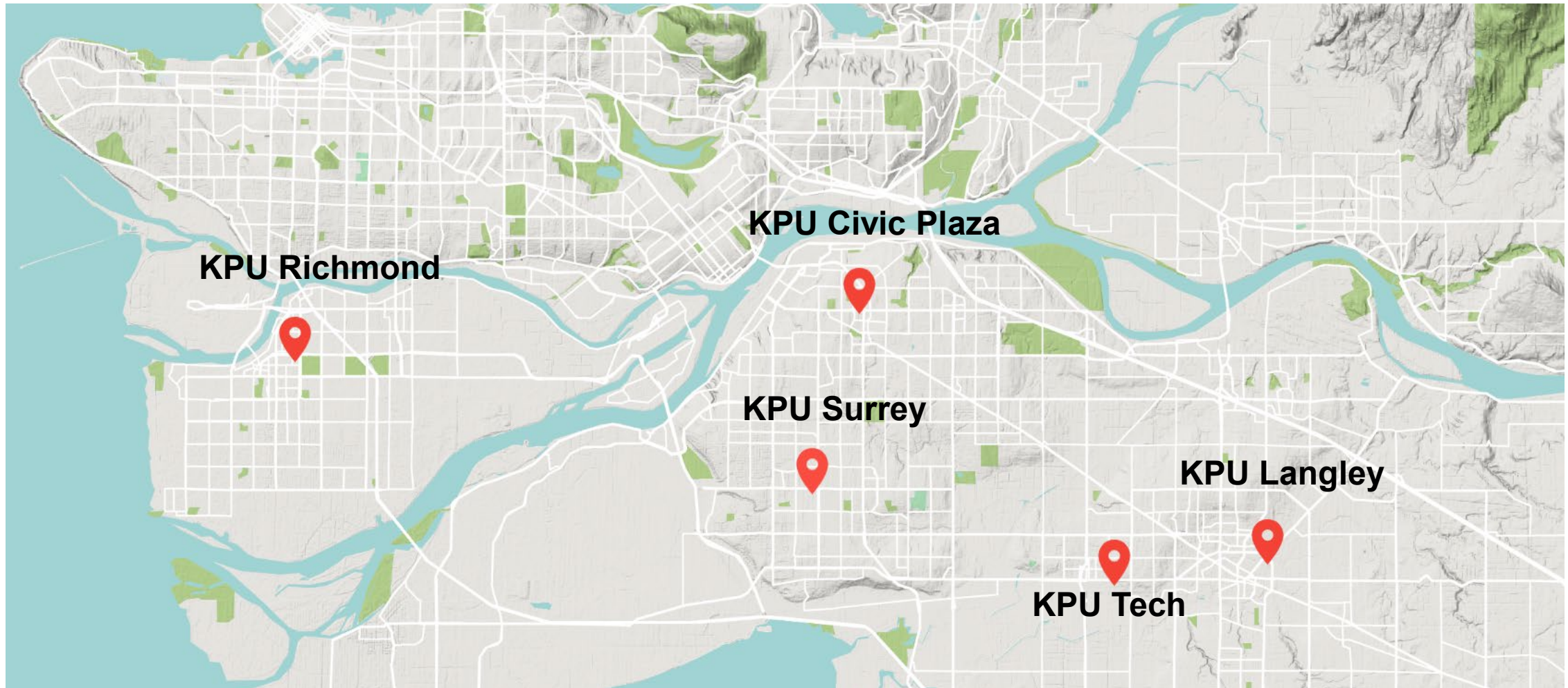
Langley campus opens



Time  
Immemorial

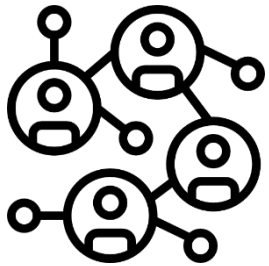
The Coast Salish peoples have stewarded and cared for the lands on which we study, work and live since time immemorial.

# KPU's Five Campuses





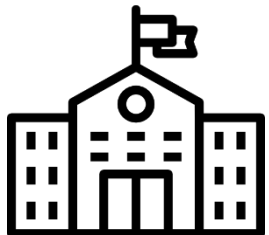
# KPU By the Numbers



- 20,726 **students**
- 12,154 **FTEs**
- 5,198 **international students**
- 1,500 **employees**
- 900 **faculty**



- Operating budget: **\$220 million**



- BC's **4<sup>th</sup> largest** university

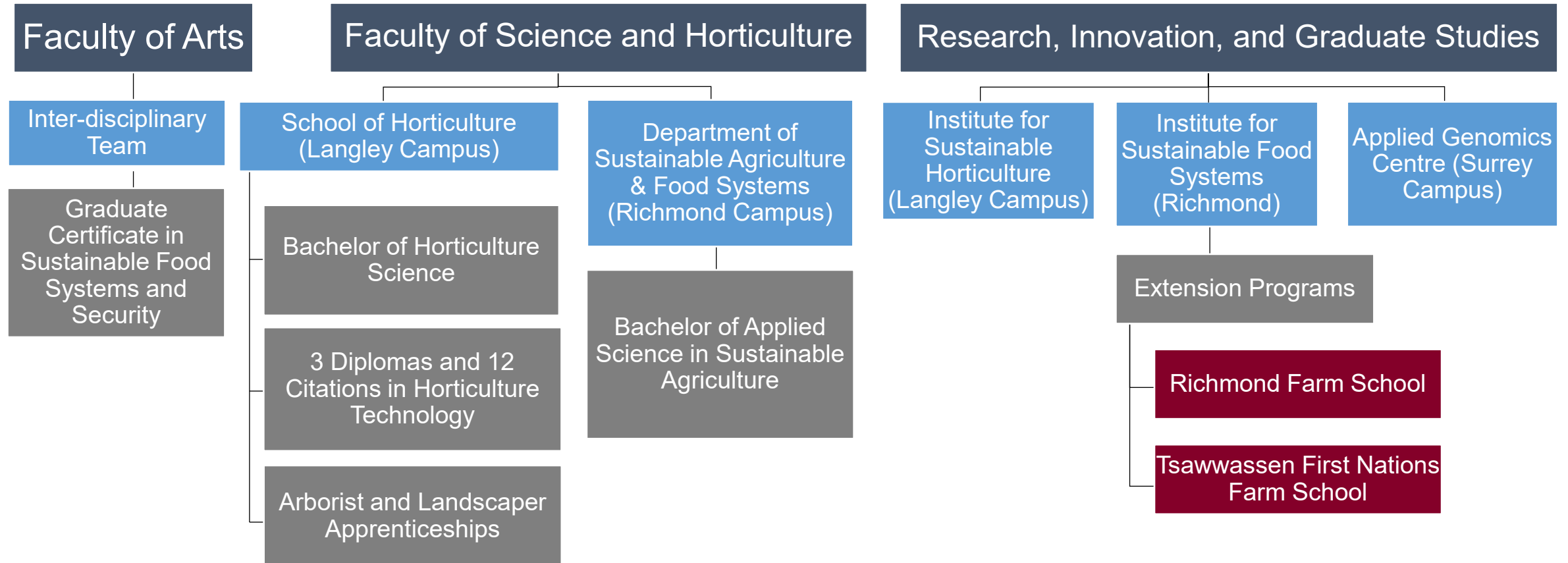


- Region of **1 million citizens**: growing and diverse

# Research Enterprise Overview

<b>&gt;120</b> Programs	<b>30-55%</b> Faculty engaged with Research	<b>4</b> Farm Schools
<b>3</b> Research Centres and Institutes	<b>6</b> Research Chairs	<b>100%</b> Exp. Learning

# Learning Ecosystem in Agriculture across KPU



**Dr. Deborah Henderson**, Director  
Institute for Sustainable Horticulture





# Institute for Sustainable Horticulture

**Dr. Deborah Henderson, Director**  
BC Regional Innovation Chair

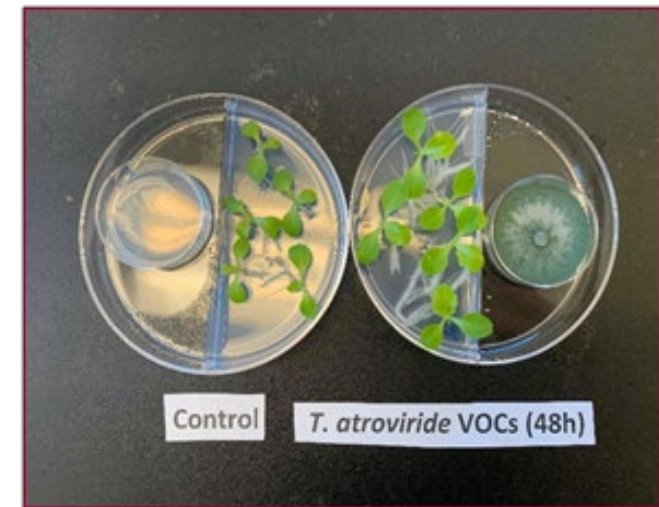


## Mission

To improve ecosystem resilience by providing tools and strategies for agriculture and landscapes through applied research, innovation, knowledge sharing and partnerships

# History

- 2004 ● Institutes (4) were established at Kwantlen to bring research to a teaching institution
  - Each had a faculty member as an acting Director (50% time release)
- 2005 ● BC Regional Innovation Chair Expression of Interest successful
  - External hire: Deborah Henderson hired 50% contract as Director
- 2006 ● Innovation Chair application completed and successful  
CFI proposal completed and successful (KPU's first CFI)  
First industry contracts and grants achieved
- 2008 ● Director position made full time and permanent
- 2009 ● Laboratory building completed
- 2010 ● Greenhouse completed, first NSERC grant





# How We Operate



Two technical staff (MSc) manage the infrastructure



Two senior research associates (PhD) manage projects, build partnerships



Technicians (4), post docs (1), students (4), international graduate students (3) participate in research projects





# Areas of partnership



**Green/clean energy** for  
greenhouses  
Optimizing biogas  
energy



**Novel cropping  
systems** that  
incorporate new  
“green”  
technologies

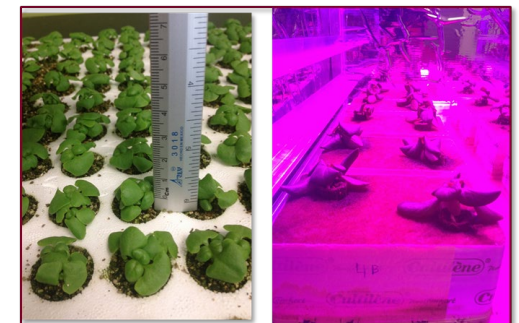


**Bioproduct  
development**

- Microbial biocontrols to fill a gap in pest management products in Canada
- Soil amendments
- Biostimulants
- Registration



**Agritech** (UV-C light,  
LED, robotics, AI,  
sensors)





# Our Partners

109

Industry  
partners



22

Industry  
associations,  
non-profits



8

International partners  
Cuba, Brazil, Ethiopia,  
Scotland, Belgium



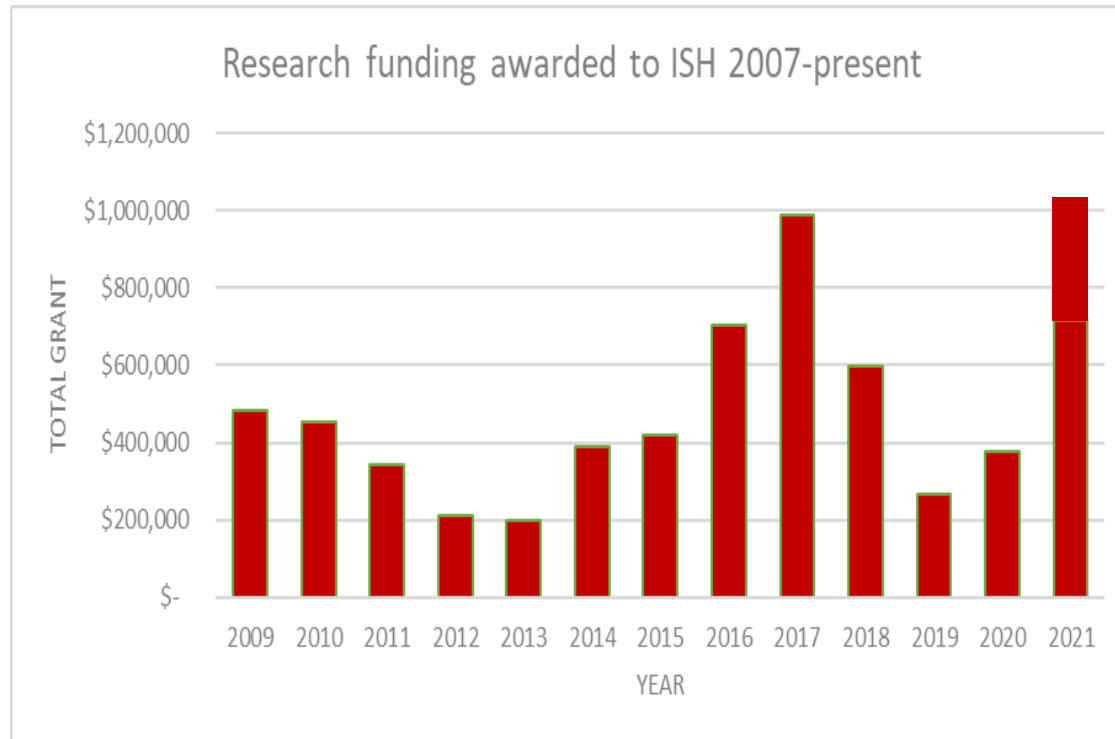
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Post-secondary  
partners (Canada)



# Funding

- Infrastructure and equipment \$7.45M
- Research funding \$6.6M



Some of our funders:

- Canada Foundation for Innovation
- Natural Sciences and Engineering Research Council
- The BC Ministry of Agriculture, Innovation Branch
- BC Investment Agriculture Foundation
- Industrial Research Assistance Program
- Agricultural Industry Associations
- Individual companies in agriculture and agritech
- Association of Universities and Colleges of Canada
- Emerging Leaders of the America Program
- LEEF Foundation
- Growing Forward
- British Council for the Arts

# Enhancing student experience



- Student research internships and capstone projects: 50
- Students hired as Research Assistants
- KPU student sustainable agriculture internships in Cuba: 37
- Graduate student internships at ISH: France 19, Cuba 5, Brazil 2, Belgium 3, Canada 2
- Greenhouse production technicians: 24 trained in 2020-21 - part of the provincial COVID food security response



# Accelerating agri-innovation to address climate change challenges



- Microbial soil health recovery after flooding – amendments, indicator species and measures
- IoT technology for climate monitoring and prediction Late Blight in potatoes
- Laser see treatments to improve crop resilience
- Pathways for registration of new bioproducts
- 7 industry partners, NSERC ARTP





**Charlene Seward**  
Indigenous Food Ways Community Outreach Facilitator  
Institute for Sustainable Food Systems



# Institute for Sustainable Food Systems

**Charlene Seward**  
Indigenous Engagement Facilitator





# Building relationships for a brighter tomorrow





# The Institute for Sustainable Food Systems





# Being in right relations with Indigenous people





# Moving from consultation to meaningful engagement



# Supporting Indigenous Food Sovereignty





# Creating space for learning and unlearning





# This is reconciliation in action.





**Dr. Paul Adams**, Scientific Director  
Applied Genomics Centre



# Applied Genomics Centre

**Dr. Paul Adams**, Scientific Director

Sherman Jen Research Chair in Applied Genomics

Scientific Director: KPU Applied Genomics Centre

Instructor: Biology Department

Faculty of Science and Horticulture



- **KPU, Surrey Campus**
- **Established 2019**



# Genetics & Metabolomics Equipment



**Next-Gen  
Sequencing**



**Sanger  
Sequencing**



**Quantitative PCR**



**UHPLC / GCMS**



**Microscopy**



**SNP Array**



**Digital PCR**

# Agriculture Innovation and Sustainability



Dairy Production



Sustainable Crop Production



Hops and Craft Brewing Innovation



Equine Health



Beef Production



New Products in Greenhouse  
Production

# Agriculture Industry Partners: 20+



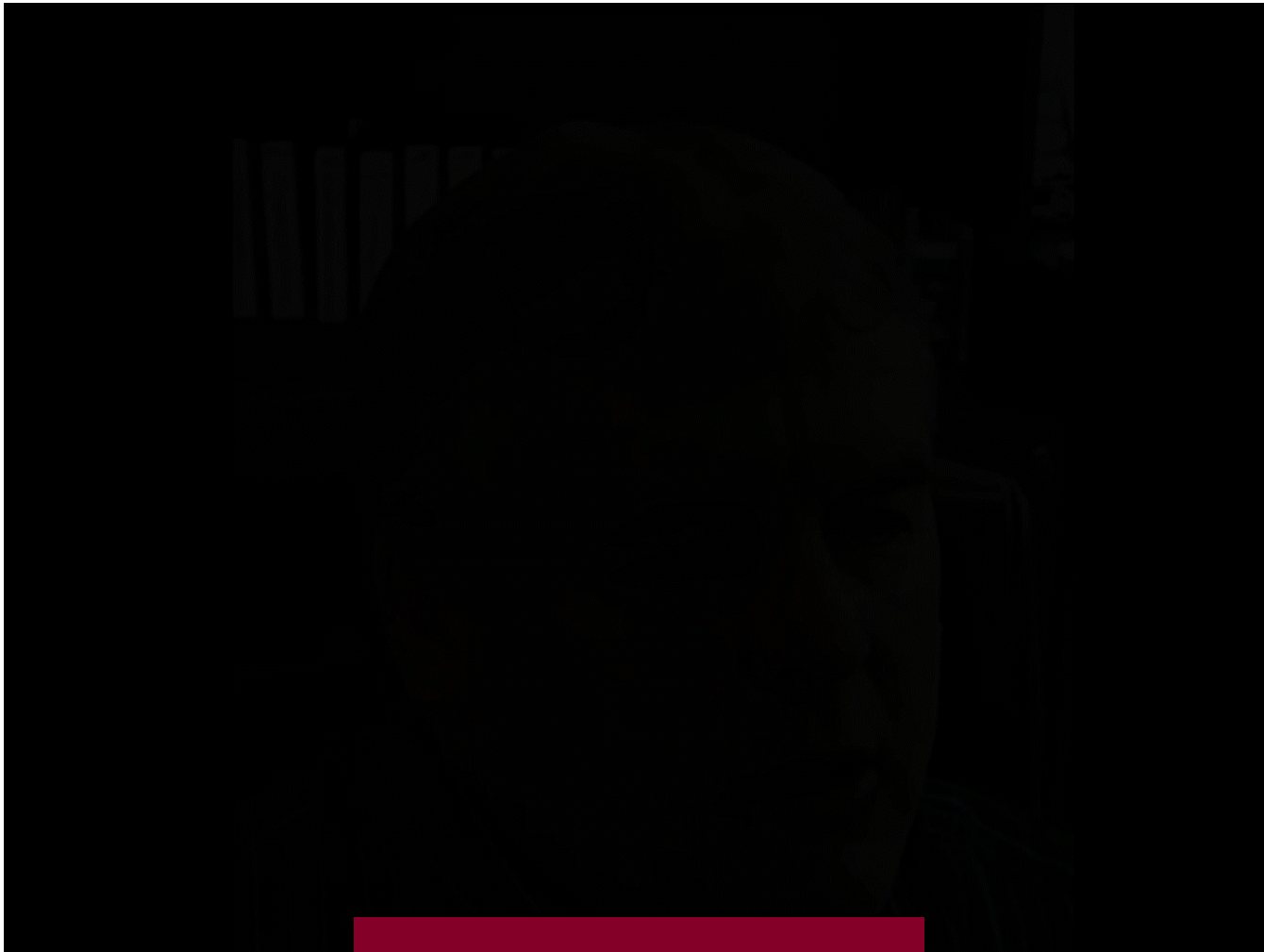
Government Organization	<div></div>	7
Companies	<div></div>	13
Academic	<div></div>	2
Non-profit Organization	<div></div>	2







Valerie Sikkema, Manager



Chris Parry, CEO

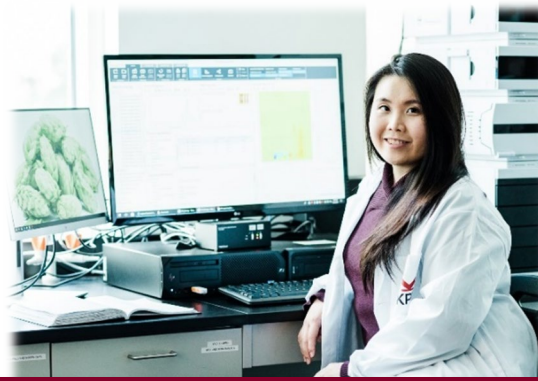




# Student Engagement in Research – Building Tomorrow's Talent



**Undergrad Lab courses**



**Honours Research Projects**



**Student Employment**

**~200**

**Undergraduate  
Course Students  
Served**

**10**

**Student Capstone  
Research Projects**

**18**

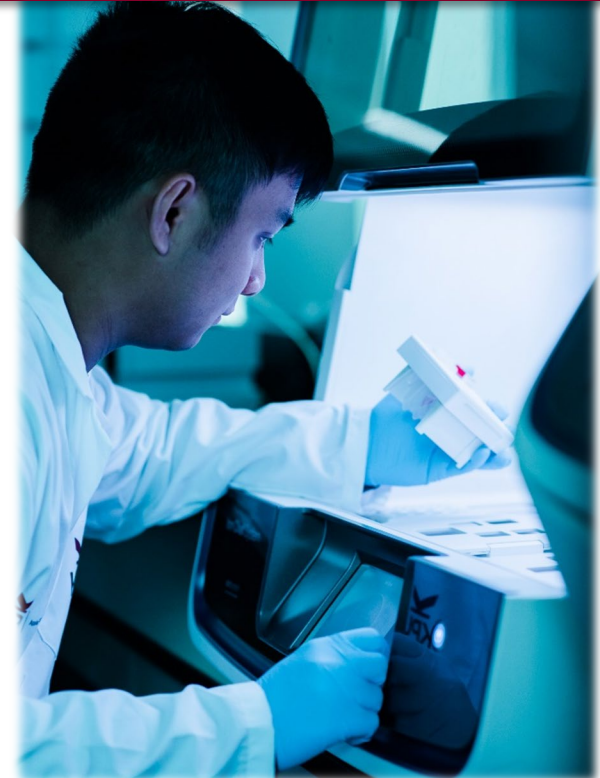
**Undergraduate  
Students Employed  
(15-35hrs/week)**

**5**

**Graduate  
Student  
Training**

# Student Engagement in Research – Building Tomorrow's Talent

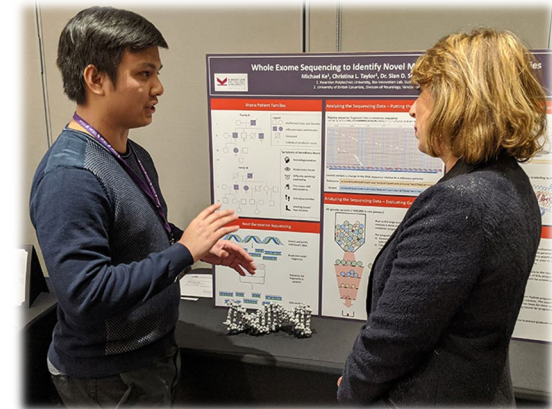
## Building Laboratory Skills





# Student Engagement in Research – Building Tomorrow's Talent

## Hands-On Industry Experience



# Funding Sources: 9 external grants







Lindsay Dodds

Lead R&D Grower  
KPU Alumna





# Sustainable Agriculture Student Experience

## Hands on Learning | Hands on Instruction



Passionate professors who aren't afraid to get their hands dirty and encourage you to do the same!







## Sustainable Agriculture Student Experience

### Applying your skills



- Biology and Plant Science are the foundation
- Experimental Design
  - Squaring out your plot
  - Data Collection
  - Analysis & Presentation
- Writing a Business Plan
  - Understanding ROI and Profitability
- Applied skills
  - Pruning
  - SOP writing and implementation
  - Equipment operation
  - Selling your produce
  - And SO MUCH MORE!





## Sustainable Agriculture Student Experience

### Networking



Many opportunities for networking with the program, and many can be funded by the Student Educational Enhancement Fund (SEEF) program at KPU

- Conferences
- Conventions
- Farm Fests with Sustainable Agriculture
- Black tie private Duran Duran concert
- Internship with Mastronardi Produce at the PMA's
- Engaging with Richmond community on the KPU Farm







## Sustainable Agriculture Alumni Experience Becoming an Industry Partner



Agriculture and  
Agri-Food Canada



**cubicfarm**  
SYSTEMS CORP.

LOCAL  
CHAIN  
AGTECH

**ENZA ZADEN**



**Highline**  
MUSHROOMS



**Microsoft**



# Get in touch!

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Vice President, Research,  
Innovation and Graduate Studies**  
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## **Institute for Sustainable Food Systems**

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[Charlene.Seward@kpu.ca](mailto:Charlene.Seward@kpu.ca)



*Thank you!*



Where thought meets action