CSHS STUDENT VIRTUAL RESEARCH CONFERENCE

March 20th, 2025

Table of contents

Message from the CSHS Student Committee

Welcome to the 2025 Canadian Society for Horticultural Science Student Virtual Research Conference! Following the success of the first CSHS Online Graduate Student Conference in 2020, we are thrilled to be hosting a second edition. The conference was made possible through the collaboration between the CSHS Executive Committee and our dedicated student committee. This event provides an excellent opportunity for students to connect and share their research in various fields within horticulture – including physiology and nutrition, plant pathology, biotechnology, and soil and the environment.

We would like to express our sincere gratitude to the CSHS executive committee for their invaluable support in organizing this event. We are especially grateful to our judges, Dr. Raphael Ofoe and Dr. Champa Wijekoon, for volunteering their time and expertise to evaluate student presentations. Additionally, we want to recognize and thank all of the student presenters and attendees whose contributions are the heart of this conference.

We encourage you to take full advantage of this opportunity to engage in discussions, ask questions, expand your networks, and gain new insights.

Thank you for your participation in this conference! We hope you have a great meeting!

Sincerely,

The 2024/2025 CSHS Student Committee

Program Schedule

March 20, 2025 - All times are in Eastern Time (ET)

Time (ET)	
10:00-10:20 am	**Opening remarks** Dr. Bourlaye Fofana, president of the CSHS executive committee Sarah Drury, chair of the CSHS student committee
10:20-10:40 am	**Clay Elzinga** (Acadia University) O1. Genome-Wide Association Studies Provide Insights into the Genetic Basis of Aroma in Apple
10:40-11:00 am	**Chamali Kodikara*** (University of Manitoba) O2. A Comprehensive Study on phenolic compounds, fatty acids, phytosterols, terpenoids, antioxidant and anti-hypertensive potential of Canadian Prairie Berries
11:00-11:20 am	**Vijaya Mohan** (Dalhousie University) O3. Ascorbic Acid Preconditioning for Seed Vigor and Crop Yield of Organically grown Broccoli
11:20-11:40 am	**Ernesto Alonso Lagarda-Clark** (Laval University) O4. Role of abiotic stresses on the quality and shelf life of haskap (*Lonicera caerulea*) berries
11:40-11:50 am	***Break***
11:50 am-12:10 pm	**Diman Taher** (McGill University) O5. Exploring the Efficacy of LED Light Spectra in Repressing Fungal Pathogen *Botrytis cinerea* Pers. in vitro
12:10-12:30 pm	**Koushika Kumaresan** (Dalhousie University)
12:30-12:50 pm	**Natalie LaForest*** (University of Alberta) O7. An initial assessment of pest and beneficial insects in industrial hemp (*Cannabis sativa*) in central Alberta
12:50-1:10 pm	**Kylie DeViller** (Acadia University) O8. Differences in apple fruit shape are independent of fruit size

1:10-1:20 pm	***Break***
1:20-1:40 pm	**Ifesinachi Nelson Ezeh*** (University of Guelph) O9. Impact of Preplant and Foliar Fertilization on Onion Nutrient Status, Yield, and Stemphylium Leaf Blight Severity in High Organic Matter Soils
1:40-2:00 pm	**Sarah Drury*** (Université de Sherbrooke) O10. The mycovirome of *Botrytis cinerea* isolates infecting strawberries and raspberries
2:00-2:10 pm	**Vivian Ly** (University of Guelph) P1. Alleviating chilling injury in postharvest sweet basil (*Ocimum basilicum* L.) using silicon and abscisic acid applications
2:10-2:20 pm	**Claudia Baldassi*** (University of British Columbia) P2. Genome-wide association studies to unravel the control of fruit color and anthocyanin content in red raspberry
2:20-2:30 pm	***Break***
2:30-2:45 pm	**Presentation of awards and closing remarks**

***Indicates a member of the CSHS student committee**

About the CSHS

The CSHS is a scientific society devoted to fostering and promoting horticultural science in Canada since 1956. With a countrywide representation, our members are for a variety of horizons: scientists, educators, students, extension agents and industry personnel involved research, teaching, information and technology related to all horticultural crops.

For more information, visit our website: https://www.cshs.ca/index.html

Current CSHS Executive Board Members

President - Dr. Bourlaye Fofana, Charlottetown, PE (Agriculture and Agri-Food Canada)

Vice-President - Dr. Lord Abbey, Truro, NS (Dalhousie University)

Past President - Dr. Youbin Zheng, Guelph, ON (University of Guelph)

Treasurer - Dr. Beatrice Amyotte, Kentville, NS (Agriculture and Agri-Food Canada)

Secretary and Communication officer - Dr. Champa Wijekoon, Winnipeg MB (Agriculture and Agri-Food Canada)

Communication officer - Dr. Raphael Ofoe, Truro, NS (Dalhousie University)

Western Representative - Dr. Simone Castellarin, Vancouver, BC (University of British Columbia)

Prairie Representative - Dr. Jazeem Wahab, Saskatoon, SK (Agriculture and Agri-Food Canada)

Ontario Representative - Dr. Melanie Kalischuk, Guelph, ON (University of Guelph)

Quebec Representative - Dr. Shahrokh Khanizadeh, St. Lazare, QC (ELM Consulting)

Atlantic Representative - Dr. Vasantha Rupasinghe, Truro, NS (Dalhousie University)

Northern Representative - Julie Lajeunesse, Normandin, QC (Agriculture and Agri-Food Canada)

Student Representative - Sarah Drury, Sherbrooke, QC (Université de Sherbrooke)

CSHS Student Committee

Chair and Representative for Quebec - Sarah Drury, Sherbrooke, QC (Université de Sherbrooke)

Co-chair and Representative for British Colombia – Claudia Baldassi, Vancouver, BC (University of British Columbia, Vancouver)

Ontario Representative - Ifesinachi Nelson Ezeh, Guelph, ON (University of Guelph)

Nova Scotia Representative - Aswin Jeyapandian, Truro, NS (Dalhousie University)

Nova Scotia Representative - Qiucheng Jiang, Truro, NS (Dalhousie University)

Manitoba Representative – Chamali Kodikara, Winnipeg, MB (University of Manitoba)

Alberta Representative – Natalie LaForest, Edmonton, AB (University of Alberta)

For more information about the student committee:

https://www.cshs.ca/studentcorner/studentcorner.html

We're looking for new members!

We are recruiting new students to join the student committee! If you are interested in joining our committee, please reach out to Sarah Drury (sarah.drury@usherbrooke.ca).

Follow us to keep up to the date with the CSHS:

@Canadian_horticultural_science

Canadian Society for Horticulture Science - CSHS

Canadian Society for Horticultural Science - CSHS

2025 CSHS Annual Conference

The 2025 CSHS Annual Conference will be held jointly with the Canadian Society of Agronomy.

When: **June 23 to 26, 2025**
Where: **Kelowna, British Columbia**

The Canadian Society of Horticultural Science (CSHS) and Canadian Society of Agronomy (CSA) are delighted to invite you to our joint-society national conference June 23-26, 2025 in beautiful Kelowna, British Columbia!

Registration is now open.

EARLY BIRD REGISTRATION CLOSES MARCH 15, 2025

The conference includes invited speakers, submitted session talks, tours, posters, banquet and networking opportunities.

Student awards presentations will also be included.

Submit and abstract and register: https://agm2025.cshs.ca/abstract.html

Oral Presentation Abstracts

O1. Genome-Wide Association Studies Provide Insights into the Genetic Basis of Aroma in Apple

Clay Elzinga[1], Thomas Davies[2], Sean Myles[2], Zoë Migicovsky[1]

[1]Department of Biology, Acadia University, Wolfville, Nova Scotia, Canada
[2]Department of Plant, Food, and Environmental Sciences, Faculty of Agriculture, Dalhousie University, Truro, Nova Scotia, Canada

Email of presenting author: 0308516e@acadiau.ca

Apples are one of the most economically important fruit crops in Canada, with the majority eaten fresh. An important component of fresh fruit quality is aroma, which plays a vital role in taste perception. Aroma is a complex trait that can be challenging to select for using traditional breeding techniques. By using genetic markers predictive of aroma-related compounds in a genomics-assisted breeding approach, we can accelerate the development of flavour-rich apple cultivars.

Canada's Apple Biodiversity Collection contains one of the most diverse collections of apples in the world and has been sequenced using Whole Genome Sequencing (WGS). We have paired over 16 million single nucleotide polymorphisms (SNPs) with measurements of over 100 aroma compounds identified using gas chromatography-mass spectrometry (GC-MS). We performed genome-wide association studies to identify SNPs significantly associated with aroma compounds. By investigating SNPs near significant GWAS associations, this work will provide new insights into the genetic basis of apple aroma compound production. These predictive SNPs could also be used in marker-assisted selection by apple breeders to aid in developing new apple cultivars with diverse and desirable aroma profiles.

O2. A Comprehensive Study on phenolic compounds, fatty acids, phytosterols, terpenoids, antioxidant and anti-hypertensive potential of Canadian Prairie Berries

Chamali Kodikara (MSc)[1,2,3], Srinivas Sura (PhD)[1], Nandika Bandara (PhD)[3,4], Thomas Netticadan (PhD)[1,2], Sijo Joseph (PhD)[1,4], Champa Wijekoon (PhD)[1,2,3]

[1]Agriculture and Agri-Food Canada, Morden Research and Development Centre, Morden, Manitoba, Canada, R6M 1Y5
[2]Canadian Centre for Agri-Food Research in Health and Medicine, Winnipeg, MB R3C 1B2, Canada
[3]Department of Food & Human Nutritional Sciences, University of Manitoba, Winnipeg, MB R3T 2N2, Canada
[4]Richardson Centre for Food Technology and Research (RCFTR), University of Manitoba, 196 Innovation Drive, Winnipeg, Manitoba, R3T 2N2, Canada

Email of presenting author: kodikarc@myumanitoba.ca

Phenolic compounds, fatty acids, phytosterols and terpenes are important bioactive molecules in berries. The research aimed to examine the phenolic compounds, fatty acids, phytosterols, terpenes and antioxidant and anti-hypertensive activities in fifteen wild berries grown in prairies. The LC-HRMS method was developed and used for the comprehensive and simultaneous analysis of 66 phenolic compounds in 15 different Canadian wild berries. In addition, GC-MS was used to analyze the fatty acids, phytosterols and terpenes. Total phenolic content (TPC), DPPH free radical scavenging assay, ferric reducing antioxidant power assay (FRAP), and total flavonoid content were assessed for their antioxidant potential. Wild grapes were rich in phenolic compounds such as resveratrol, while gooseberries were rich in isoquercetin and para-coumaric acid. Saskatoon berries were rich in chlorogenic acid and quercetin. Essential fatty acids such as linoleic and linolenic acids were found in wild grapes and haskap berries. Amyrins and phytol were found abundantly in Saskatoon berries. The highest (p<0.05) TPC was in nanny berries, while chokeberry showed the highest FRAP activity. Seabuckthorn showed the highest (p<0.05) anti-hypertensive activity. A novel LC-HRMS method for phenolic compounds and a GC-MS method for fatty acids proved that the underutilized wild berries contain various beneficial phenolic compounds, essential fatty acids, phytosterols and terpenes. These berries, as sources of these important bioactive compounds, have the potential to be included in antioxidant-rich diets. The information from this study will help in finding applications for underutilized prairie berries as potential sources of functional food.

O3. Ascorbic Acid Preconditioning for Seed Vigor and Crop Yield of Organically grown Broccoli

Vijaya Mohan, Mason T. Macdonald, Andrew M. Hammermeister and Lord Abbey

Email of presenting author: vj797230@dal.ca

Seed preconditioning is a widely adopted technique in agriculture used to enhance seed germination, plant vigor, and overall yield. Ascorbic acid (AsA), a naturally occurring antioxidant, is an effective seed preconditioning agent due to its affordability, accessibility, and ability to enhance plant yield. However, limited research exists on the impact of AsA seed preconditioning in broccoli (*Brassica oleracea*), specifically regarding yield. The study aims at determining the effects of varied concentrations of AsA seed preconditioning (control, 0 ppm (water), 1 ppm, or 10 ppm) on broccoli germination and yield under organically managed field conditions. The research comprises laboratory germination trials and a field experiment in Truro, Nova Scotia. The results showed that AsA increased the seedling vigor index, primary yield, number of secondary heads, and secondary yield of broccoli. The 10 ppm AsA significantly ($p < 0.05$) increased the seedling vigor index during germination by 11% and 9% compared to control and 0 ppm treatments, respectively. Additionally, 10 ppm AsA significantly ($p < 0.05$) increased total yield by 51% and 45% compared to control and water treatments, respectively. These findings highlight the potential of AsA as an effective organic seed preconditioning agent to enhance broccoli production. Implementing AsA preconditioning in organic farming systems could improve crop performance and contribute to sustainable agricultural practices.

O4. Role of abiotic stresses on the quality and shelf life of haskap (*Lonicera caerulea*) berries

Ernesto Alonso Lagarda-Clark[1,2,3], Charles Goulet[2,4], Arturo Duarte-Sierra[1,2,3]*

[1]Food Science Department, Laval University, Quebec, QC G1V 0A6, Canada.
[2]Centre de recherche et d'innovation sur les végétaux (CRIV), Laval University, Quebec, QC G1V 6 0A6, Canada.
[3]Institute on Nutrition and Functional Foods (INAF), Laval University, Quebec, QC G1V 8 0A6, Canada.
[4]Department of Phytology, Université Laval, Québec, QC G1V 0A6, Canada

*Corresponding author
Email of presenting author: arturo.duarte-sierra@fsaa.ulaval.ca

Haskap (*Lonicera caerulea*) berry is an emerging crop for North American growers. However, the inherent fragile nature of haskap berries demands the use of specialized strategies. Postharvest treatments using oxidative and reductive stress influences fresh produce through their implications in redox cellular balance. While excessive stress accelerates spoilage, controlled doses can induce adaptive responses, enhancing antioxidant systems and improving overall quality. Therefore, the present work investigates the effects of UV-C (2.4-6 kJ m2), a pulsed light treatment (6 pulses of 38 kJ m2), and hydrogen sulphide (H2S) fumigation (0.6-2.4 mM). Berries were stored at 0 °C and 90-95 % relative humidity. A full factorial design was conducted for measurements on firmness, weight loss, total soluble solids (TSS), titratable acidity (TA), and color. The study was carried out for 4 weeks continuously accompanied by the quantification of phenols, flavonoids, and anthocyanins. Treatments of 2.4 kJ m2 delayed softening and weight loss of haskap berries compared to the control without significantly affecting TSS, TA and color. The highest phenolic content (431.17 ± 24.63 mg GAE 100 g fresh weight) was observed after 2 weeks of storage. Pulsed light also had a significant effect on delaying the senescence of haskap, retarding softness and weight loss. Phenols and flavonoids were also increased after 2 weeks (377.10 ± 18.00 mg GAE 100 g fresh weight and 496.36 ± 10.44 mg rutin Eq 100 g fresh weight). In terms of phytochemical accumulation, 2.4 mM of H2S showed the highest stimulus, although the quality of berries was significantly better preserved under 0.6 mM treatment. Present results suggest the positive effect in haskap quality for 2 weeks when controlled stress dose is applied.

O5. Exploring the Efficacy of LED Light Spectra in Repressing Fungal Pathogen *Botrytis cinerea* Pers. *in vitro*

Diman Taher, William Jordan and Valerie Gravel

Department of Plant Science, McGill University – Macdonald Campus, 21111 Lakeshore Road, Sainte-Anne-de-Bellevue, QC H9X3V9

Email of presenting author: diman.taher@mail.mcgill.ca

Botrytis cinerea Pers., a ubiquitous necrotrophic pathogen, is the primary cause of grey mould in numerous economically important crops, including tomato. Light-emitting diode (LED) lighting has emerged as a promising supplemental light source in greenhouse horticulture, influencing not only crop physiology but also the biology of pathogens. In this in vitro study, we evaluated the efficacy of strategically combined far-red and blue LEDs—applied in ratios of 1:5, 1:1, and 5:1—on the viability and pathogenicity of a *B. cinerea* isolate from tomato. The photomorphogenic response of *B. cinerea* under these LED treatments was compared with that under high-pressure sodium (HPS) lighting (supplementing ambient white light) and complete darkness. The results revealed that while all LED ratios effectively inhibited sporulation, only the 5:1 and 1:1 treatments significantly suppressed hyphal growth. However, the LED treatments did not outperform the HPS or dark controls in inhibiting pathogen spore germination. These findings suggest that specific far-red:blue LED combinations, particularly the 5:1 and 1:1 ratios, hold potential for managing grey mould disease in controlled environment settings.

O7. An initial assessment of pest and beneficial insects in industrial hemp (*Cannabis sativa*) in central Alberta

Natalie LaForest

Email of presenting author: nlafores@ualberta.ca

Industrial hemp (*Cannabis sativa* L.) is experiencing a resurgence, particularly in Alberta, which accounts for nearly half of Canada's total hemp production. Despite this growth, research on agronomic practices for this crop remains limited, especially in the areas of insect pest management and community dynamics. To assess temporal and spatial variations in potential pest and beneficial insect populations, insect sampling was conducted in central Alberta hemp fields in 2021 and 2022. Sampling occurred at three time points throughout the growing season along two transects (1 m and 100 m from the crop margin). Key potential pests identified included multiple species of Lygus bugs, grasshoppers, and leafhoppers. Beneficial insects were represented by several families of parasitoid wasps, predatory flies, and generalist predators such as lacewings, damsel bugs, big-eyed bugs, minute pirate bugs, and various spider families. Only a few pollinators were collected during the survey. The ground beetle community was dominated by *Pterostichus melanarius*, an introduced species. This study provides a baseline assessment of potential pest and beneficial insect species associated with industrial hemp in central Alberta. The findings will help inform future research and contribute to the development of integrated pest management (IPM) strategies for this emerging crop.

O8. Differences in apple fruit shape are independent of fruit size

Kylie DeViller[1], Daniel H. Chitwood[2,3], Sean Myles[4], Mao Li[5], Zoë Migicovsky[6]

[1]Jodrey School of Computer Science, Acadia University, Wolfville, Nova Scotia, Canada
[2]Department of Horticulture, Michigan State University, East Lansing, Michigan, USA
[3]Department of Computational Mathematics, Science & Engineering, Michigan State University, East Lansing, Michigan, USA
[4]Department of Plant, Food, and Environmental Sciences, Faculty of Agriculture, Dalhousie University, Truro, Nova Scotia, Canada
[5]Donald Danforth Plant Science Center, St. Louis, Missouri, USA
[6]Department of Biology, Acadia University, Wolfville, Nova Scotia, Canada

Email of presenting author: 162298d@acadiau.ca

Fruit shape and size are essential traits for apple breeding as visual appearance is a primary way that consumers assess fruit quality and make purchasing decisions. Understanding how these traits differ across diverse varieties helps inform future breeding targets in apple. We used comprehensive morphometrics to examine morphological variation across 5724 images from 743 different trees, representing 534 unique accessions, taken from Canada's Apple Biodiversity Collection. We applied a pseudo-landmarking approach and combined these overall morphological measurements with traditional measurements such as fruit length, width, and fruit weight. Our results concluded that the primary source of variation in shape was associated with the aspect ratio (width to length ratio of the fruit). The size of the fruit, as measured using both area and weight, had no significant correlation with the variation in shape. These findings demonstrate that apple fruit shape and size are independent of each other and suggest that it is possible to breed new apples with unique shapes without negatively impacting fruit size.

O9. Impact of Preplant and Foliar Fertilization on Onion Nutrient Status, Yield, and Stemphylium Leaf Blight Severity in High Organic Matter Soils

I. N. Ezeh[1], G. Farintosh[1], K. Vander Kooi[1], Xavier Hébert-Couturier[2] and M. R. McDonald[1]

[1]Department of Plant Agriculture, University of Guelph, Crop Science Building, University of Guelph, 50 Stone Road E. Guelph, Ontario, Canada, N1G 2W1.
[2]Picketa Systems Inc., J. Herbert Smith Center, H-225, Head Hall, 17 Dineen Drive, P.O. Box 4400, Fredericton, NB, Canada, E3B 5A3

Email of presenting author: iezeh@uoguelph.ca

Stemphylium leaf blight (*Stemphylium vesicarium*, SLB) is a major disease of onions in the Holland Marsh, compounded by the declining fungicide efficacy due to resistance. Observations suggest that higher fertilizer applications may reduce SLB severity. This study evaluated the effects of preplant and foliar fertilizers on nutrient uptake, disease incidence, and onion yield in high organic matter soils (~50%). The experiment was a randomized complete block design with a factorial arrangement. Factors were preplant NPK application (NPK vs. none) and foliar fertilizer treatments (none, manganese sulfate, tissue-test-based applications). Leaf nutrient status was assessed using Picketa Leaf Evaluated Nutrient System (LENS) technology and SGS laboratory analysis, and SLB severity was evaluated at multiple time points. Marketable yield was categorized into jumbo, large, medium, and cull grades. Results showed preplant NPK increased disease severity on 25 July but had no significant effect on later dates. Foliar treatments did not impact SLB severity. However, preplant NPK effect on yield (48.0 t ha-1, $p < 0.05$) was significant and produced a higher proportion of jumbo and large onions. Foliar fertilizers had no significant impact on yield or size distribution. A negative correlation ($r = -0.73$, $p = 0.0001$) was observed between SLB severity and yield on July 25, which weakened over time. The positive correlation on August 13 suggests that late-season SLB severity did not affect final yield. Findings suggest preplant NPK improves yield but may influence disease progression. Further research is needed to refine integrated disease and fertility management strategies.

Keywords: Onion, Stemphylium leaf blight, foliar nutrients, Picketa LENS, fertilizer optimization, nutrient status

O10. The mycovirome of *Botrytis cinerea* isolates infecting strawberries and raspberries

Sarah C. Drury[1,2], Abdonaser Poursalavati[1,2], Pierre Lemoyne[1], Dong Xu[1], Peter Moffett[2], Odile Carisse[1], Herve van der Heyden[1] and Mamadou Lamine Fall[1]

[1]Saint-Jean-sur-Richelieu Research and Development Centre, Agriculture and Agri-Food Canada, Saint-Jean-sur-Richelieu, Quebec, QC J3B 3E6, Canada
[2]Centre SÈVE, Département de Biologie, Université de Sherbrooke, Sherbrooke, Québec, QC J1K 2R1, Canada

Email of presenting author: sarah.drury@usherbrooke.ca

Botrytis cinerea causes significant economic losses to many crops, including vegetables, fruits, and ornamental plants, and its management is becoming increasingly difficult due to a rise in fungicide resistance. Harnessing mycoviruses that cause reduced virulence (hypovirulence) in *B. cinerea* is a promising alternative. Over 100 mycoviruses have been identified in *Botrytis* spp. to date, including several hypovirulence-inducing mycoviruses. This research aimed to further explore, for the first time in Canada, the mycovirome of *B. cinerea* and identify potential hypovirulence-inducing mycoviruses. Isolates of *B. cinerea* were collected from fruits and vegetables in the province of Quebec. Fitness and pathogenicity criteria, including sclerotia production, colony morphotype, and lesion size were evaluated. A double-stranded RNA (dsRNA) extraction protocol tailored to the detection of mycoviruses was used to sequence dsRNA from 45 isolates with low fitness/pathogenicity, and an in-house bioinformatics workflow was used to profile the mycovirome. Mycoviruses were identified in 44/45 isolates. Most mycoviruses had positive single-stranded RNA or dsRNA genomes, and a small number had negative single-stranded RNA, single-stranded DNA, or reverse transcriptase RNA genomes. Following deep analysis of RNA-dependent RNA polymerase and replication initiation proteins, a total of 62 unique contigs were identified belonging to new strains of mycovirus species. Furthermore, four putative novel mycovirus species belonging to *Endornaviridae*, *Botybirnaviridae*, *Peribunyaviridae*, and *Bunyavirales* taxa were identified. Several mycovirus species positively and/or negatively co-occurred with *B. cinerea* isolates collected from strawberry or raspberry. This study revealed a high degree of diversity in the mycovirome of *B. cinerea.* We also identified potential hypovirulence-inducing mycoviruses, including Botrytis cinerea mitovirus 1, Botrytis cinerea hypovirus 1, and Botrytis porri botybirnavirus 1. Some of these novel mycoviruses belonged to taxa known to produce viral particles, which can be an interesting feature for their use as biocontrol agents.

Poster Presentation Abstracts

P1. Alleviating chilling injury in postharvest sweet basil (*Ocimum basilicum* L.) using silicon and abscisic acid applications

Vivian Ly and Youbin Zheng*

*Corresponding author: yzheng@uoguelph.ca
Email of presenting author: vly03@uoguelph.ca

Sweet basil (*Ocimum basilicum* L.) is highly susceptible to chilling injury (CI) and will develop symptoms that reduce its postharvest quality and shelf life during exposure to temperatures commonly used to handle most fresh produce (<10 °C). To determine whether silicon (Si) and abscisic acid (ABA) applications can mitigate these symptoms, this study conducted two trials. In Trial 1, a Si solution (189 mg/L) or deionized water (control) were applied during cultivation via rootzone irrigation or foliar spray. A portion of these plants were also foliar sprayed with ABA (1000 mg/L) before harvest. In Trial 2, wollastonite was added to growing media before seeding at different rates (0, 1, 2, 3, 4, 5 mL/L) as the Si source. Applying the Si solution using either method reduced leaf necrosis, fresh weight loss, and electrolyte leakage during postharvest cold storage at 3.5 °C, prolonging shelf life to at least 14 days. There were also no negative impacts on plant performance during cultivation (chlorophyll content, shoot height, and canopy width). The ABA solution, alone or in combination with Si solution treatments, reduced symptoms but less effectively, only prolonging shelf life to 8 days at best. Using wollastonite had no positive effects. These findings suggest that Si solution applications are a promising strategy to alleviate CI during the postharvest cold storage of basil.

P2. Genome-wide association studies to unravel the control of fruit color and anthocyanin content in red raspberry

Claudia Baldassi[1], Eric Gonzalez-Segovia[2], Loren Rieseberg[2], Simone D. Castellarin[1], Michael Dossett[3]

[1]Wine Research Center, Faculty of Land and Food Systems, University of British Columbia, Vancouver, BC V6T 1Z4, Canada
[2]Department of Botany, University of British Columbia, Vancouver, BC V6T 1Z4, Canada
[3]BC Berry Cultivar Development Inc., Abbotsford, BC Canada

Email of presenting author: claudia.baldassi@ubc.ca

Red raspberries (*Rubus idaeus* L.) are a high-value crop, and are acclaimed for their fruit quality characteristics and putative health benefits. Among fruit quality characteristics, color is a critical trait in determining market acceptability and consumer preference. Red fruited cultivars are the most common in commercial settings and market selection is dependent on the color intensity: while the processing industry needs dark berries for most applications, the fresh market requires bright red and non-darkening fruit. Anthocyanins, a group of water-soluble phenolic compounds, are regarded as the major contributors to raspberry red fruit color. Knowledge on the genetics of raspberry fruit pigmentation would be valuable for breeding programs, but to date the genetic control of the different red intensities of raspberries remains elusive. The present study aims to map the genetic regions underlying the red shades of raspberry fruit through genome-wide association studies (GWAS). Fruits from 765 red raspberry cultivars and selections were harvested over four seasons and analyzed for total anthocyanin content and color parameters collected through digital phenotyping. Total anthocyanin content averaged 50 mg cyanidin-3-O-glucoside equivalents/100 g fresh weight (FW) and color coordinate L*, representing lightness, averaged 21.71. Leaves from all genotypes were harvested in summer 2022 and used for genomic DNA extraction. Whole-genome sequencing of DNA samples was conducted with Illumina technology. Sequences were aligned to the 'Malling Jewel' reference genome and were processed for the detection of single nucleotide polymorphisms (SNPs). The GAPIT toolkit was used to perform the association between phenotypic and genotypic data. The GWAS conducted on total anthocyanins found significant SNPs on chromosomes 1 and 4, while the GWAS conducted on L* highlighted multiple significant SNPs across chromosomes, but the signals were stronger on chromomes 1 and 4. Regions containing SNPs significantly associated with total anothocyanins and L* will be further analyzed to pinpoint candidate genes involved in the control of the traits of interest. The results of this study will be valuable for the future development of molecular markers to facilitate the development of raspberry cultivars with desired fruit color.