

## NCCC212 virtual meeting 2021 North Dakota State University

**Evaluation of performance of small fruit selections in North Dakota.** Harlene Hatterman-Valenti, Esther McGinnis, Janet Knodel, Kalidas Shetty, and David Dai.

**Graduate students: Caitlin Krueger PhD, Avery Shikanai PhD, Sarah Borgenrief MS, Venkateswara Kadium MS, Mika Mzumara MS, and Jacob Lachowitz MS**

**Objective 1 - *Develop small fruit germplasm through cooperative breeding and evaluation programs.***

Grapes: Initiated a germplasm enhancement project in 2009 with the goal of developing one red and white wine grape that will be winter hardy to -40 F without protection and ripen with only 1800 GDD base 50 F. Utilizing *V. riparia* for winter hardiness. Selected 5 accessions for advanced selections into replicated trials at two locations in comparison to industry standards and still collecting patent information on two selections approved for pre-release.

Juneberry: Collected native Juneberry biotypes for nursery evaluation in comparison to the most common cultivars available in Canada and the US. Continue to evaluate thirty-one biotypes and 14 named cultivars at two locations (Williston and Absaraka) for phenotypic and fruit yield evaluations. Yield data gathered from harvests over the past four years indicate up to 10 biotypes have superior attributes compared to 14 names cultivars. One nursery still interested in biotype with upright characteristics, which is one of two approved for pre-release with patent information being collected.

Other small fruit crops: Dr. Dai continues to test chokecherry lines for resistance to X-disease. Hatterman-Valenti continues to evaluate black currant germplasm from BC breeder.

**Objective 2 - *Develop practices for small fruit production tailored for climatic and market needs of growers.***

Grapes: This past winter devastating dieback of almost all cultivars occurred in the western three quarters of the state as a very dry fall, little snow fall and very cold temperatures occurred late fall. Spring frost around Mother's Day caused more injury to grapes on mid-wire trellis systems than high wire trellis systems. A joint trial with the UM (Clark) is evaluating how soils impact cold hardy grapes and wine quality.

Blackberry and Raspberry: Dr. Dai has grant to evaluate integrated SWD management in red raspberries.

Other small fruit crops: A PhD student **continues** to evaluate SWD distribution and presence in small fruit somewhat unique to North Dakota. A MS student has initiated a study to evaluate day-neutral strawberry cultivars in three different environments. Plans to incorporate a fourth environment (hydroponic in high tunnel) next year.

**Objective 3 - *Evaluate pre- and postharvest fruit quality components, including enhanced flavor, texture/firmness, shelf life, and phytonutrients.***

Collaboration initiated with Dr. Shetty to examine the concentrations of human health compounds in haskap and black currant cultivars.

**Objective 4 - *Identify opportunities and collaborate on the development of extension resources for multistate, regional, national, and/or international audiences.***

Working with four state specialists on grape multi-state specialty crop proposal.

**1. List retrievable or archived publications arising from your collaborative research and extension projects.**

Presentations:

- Kadium, V. R., A. Svyantek, J. Stenger, S. Bogenrief, C. Auwarter, and H. Hatterman-Valenti 2020. Analysis of dormancy acclimation response in incomplete diallel population representing NDSU-GGEP. North Dakota Academy of Science. Proc. of the 112th Annual Meeting (Virtual.)
- Kadium, V.R., A. Svyantek, J. Stenger, C. Auwarter, and H. Hatterman-Valenti. 2021. Molecular Investigation of fruit quality in the cold climate adapted wine grapes (*Vitis* spp.). American Society for Enology and Viticulture- Eastern Section Annual Conference (Virtual).
- Kadium, V.R., A. Svyantek, John Stenger, Sarah Bogenrief, Collin Auwarter, and Harlene Hatterman-Valenti. 2021. Following the map to climate resilience in the next generation of cold climate-adapted winegrapes. American Society for Enology and Viticulture National Conference (Virtual)
- Kadium, V., A. Svyantek, J. Stenger, S. Bogenreif, C. Auwarter, H. Hatterman-Valenti. 2021. Following the Map to Climate Resilience in the Next Generation of Cold Climate Adapted Wine Grapes (*Vitis* spp.). 36th Annual Plant Science Graduate Students' Symposium. Virtual meeting hosted by University of Saskatchewan)
- Svyantek, A., Z. Wang, J. Stenger, V. Kadium, C. Auwarter, X. Li, M. Clark, D. Chitwood, H. Hatterman-Valenti. 2021. Dr. Grapelove or: How I Learned to Stop Working and Love the Leaf. North Dakota State University- Gamma Sigma Delta Symposium. Fargo, ND.
- Svyantek, A., Z. Wang, J. Stenger, V. Kadium, C. Auwarter, X. Li, M. Clark, D. Chitwood, H. Hatterman-Valenti. 2021. Complex Problems Call for Compound Solutions: Breeding for Leaf Shape in Grapevines. North Dakota State University- Graduate Student Council Research Symposium. Fargo, ND.

Publications:

- Dai, W.H. and C.A. Kim. 2020. Expression of the Poplar FER-LIKE Iron Deficiency-induced Transcription Factor 1 gene (PtFIT) in Raspberry Does Not Consistently Respond to Iron Deficiency. *In Vitro Cell. Dev. Biol.-Animal* 56 (1):S54-S54.
- Dai, W.H. and C.A. Kim. 2020. Plant regeneration of red raspberry (*Rubus idaeus*) cultivars 'Joan J' and 'Polana'. *In Vitro Cell. Dev. Biol.-Animal* 56 (3):390-397.
- Aipperspach, A., J. Hammond, H. Hatterman-Valenti. 2020. Utilizing pruning and leaf removal to optimize ripening of *Vitis riparia*-based 'Frontenac Gris' and 'Marquette' wine grapes in the Northern Great Plains. *Horticulturae* 6(1):18. <https://doi.org/10.3390/horticulturae6010018>.
- Svyantek, A., B. Kose, J. Stenger, C. Auwarter, and H. Hatterman-Valenti. 2020. Cold-hardy grape cultivar winter injury and trunk re-establishment following severe weather events in North Dakota. *Horticulturae* 6(4):75. <https://doi.org/10.3390/horticulturae6040075>.