Canadian Grapevine Certification Network
CGCN · RCCV
Réseau Canadien de Certification de la Vigne

Plain Language Research Summary - AgriScience Grape & Wine Cluster 2023-2024

Activity 17: Enhancing the resilience of Nova Scotia vineyards to climate change through improvements to ecosystem services

Principal Investigator(s): Dr. Debra Moreau, Dr. Vicky Lévesque (AAFC Kentville), Dr. Derek Lynch (Dalhousie University)

1. **What is the overall focus of this research activity?**

   The overall focus of this activity is to develop innovative best management practices that will include enhancing ground and soil through the use of organic amendments like biochar, wood chips, green compost and wildflowers in conventional and organic production systems. Research objectives will include: (1) below-ground assessment of impact of ground management and organic amendments over time in conventional and organic systems on soil health and fertility; soil biological diversity and function; and soil organic carbon. (2) Above-ground assessments of ground/soil management and organic amendments over time in conventional and organic systems on: nutrient composition and yield measurements; soil and canopy temperature and soil moisture content as it relates to frost injury and grapevine phenological development; evaluation of under-vine establishment of host plants and the impact on natural enemy abundance and biocontrol of grape phylloxera; and seasonal dynamics of emerging and invasive pests (soil-borne and leaf/cluster feeding). (3) Evaluate grapevine performance of disease resistant varieties under Nova Scotia growing conditions.

   The organic amendments are intended to give growers sustainable agricultural practices that build carbon levels in the soil, improve soil health and fertility, support the biodiversity of beneficial microorganisms and insects below and above ground, and enhance vine performance. The proposed research will use a multi-disciplinary strategy to introduce and evaluate how soil amendments can enhance various ecosystem services to improve vineyard resilience in eastern Canada.

2. **What are the main progress updates/milestones in terms of work that was done on this research activity this year?**

   Planning and refinements to the proposed work objectives and activities were made to adjust for implications from the Polar Vortex event in February 2023 and then the

delayed start date. The Project Leads have met with the cooperating growers to ensure their continued support and to discuss the proposed plans, timelines, impacts to vineyards and support (i.e., cultivating soil amendments, etc.) needed by their teams. Based on discussions with growers, the Project Leads identified that a green compost would be a better option for a source of organic amendment versus from an animal source. This would also avoid possible contamination and high content of nitrogen. Project Leads have contacted various suppliers of compost to confirm quantity available and costs. Discussions with commercial nurseries regarding available disease-resistant varieties are ongoing. Some preliminary work (Sub-activity 1b) was done to optimize methods and source primers for screening pathogenic soil fungi. Assays were developed specifically for this project.

3. **What is this research activity's intended impact on the Canadian grape and wine industry? What benefits could/will the growers, wineries, consumers, etc. see as a result of this research?**

Research findings will support the development of innovative best management practices that incorporate ground management and organic amendments in conventional and organic systems, to promote sustainable agricultural practices that build soil carbon, improve soil health and fertility and enhance biodiversity in order to have significant impact on quality of modern viticulture systems. The research findings will also support the production of high-quality wine-grapes through use of more sustainable practices, with reduced inputs that include fertilizers and pesticides, that minimize risks to the environment and ensure long-term sustainability of their vineyards as farms face impacts from climate change.

The proposed research will focus on: (1) development of new and modified practices to improve soil carbon loads, soil health and fertility using ground management and organic amendments in conventional and organic systems, (2) enhancing existing ecosystem services specifically, carbon sequestration capacity, reductions in greenhouse gas emissions from amendments (mulches, green fertilizers), weed and nutrient management, reduce soil compaction, (3) optimizing under vine management treatments to mitigate frost and the likelihood of injury from frost events in the Spring, (4) promote biodiversity of beneficial species that will improve pest management, (5) evaluate the performance of new disease resistant varieties in NS in efforts to reduce inputs, and (6) contributing to the new Canadian Digital Soil Data Portal, an online repository of soil databases and information.

4. **Do you have any communications materials, publications, or other content related to this research activity that you would like CGCN-RCCV to share? If so, please provide a brief description here and either link it here or send the file as an attachment along with this summary.**

   Not at this time.