Ontario

NCCC 212 Report
Ontario Berry Research Summary

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Highlights:
New Specialty Crops Innovation Professor Dr. Melanie Kalischuk, University of Guelph
New Horticulture Pathologist, Katie Goldenhar, OMAFRA

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

Strawberry:
Title: *Strawberry Anthracnose Fruit Rot Model Adoption*. E. Pate, OMAFRA, K. Schooley, Berry Growers of Ontario.

Day neutral strawberries are an emerging crop in Ontario. Anthracnose fruit rot was identified as a major problem in Ontario in the early 2000's. It became controllable from 2003-2005 with the registration of two closely related fungicides. Results from a previous project found populations of *C. nymphiae* on several strawberry farms to be resistant or moving toward resistance to the fungicides. Results from this project also verified a Strawberry Anthracnose Fruit Rot model (developed by Wilson et al. 1990) that reduces fungicide applications by better timing and targeting the fungicide applications and therefore reduce the exposure of the pathogen to the selection pressure of excess fungicide applications which reduces the risk of resistance developing in the future without compromising disease control, yield or berry quality under Ontario conditions. The 2019 'Strawberry Anthracnose Fruit Rot Model Adoption' project built on the results of the first project by helping 'early adopter' strawberry growers who are leaders in the Ontario strawberry grower community try the Strawberry Anthracnose Fruit Rot Model on their farms during the 2019 strawberry season.

The model used in Ontario was evaluated in trials in Florida, where thresholds for captan and pyraclostrobin applications were developed. The model was validated in 2016-2017 in Ontario conditions which determined that by using this model growers could reduce fungicide applications by 7-33%. The 2019 project built on these results, and 5 growers across the province used the model to gain experience and help with adoption.

All participants had similar feedback regarding their experience using this model: it

provided good information, was helpful in timing fungicide applications, and was a good tool to learn more about the conditions that lead to infection. However, there were two concerns with this model. The first issue is incorporating this model into a management program where other pests need to be managed and harvest schedules need to be maintained. For example, growers need to spray for insects such as spotted wing drosophila weekly, and for other diseases including powdery mildew weekly, whereas the model could be triggered every 10 days. The other factor in further adoption of this model is the economics. While growers acknowledge the benefit of reducing fungicide applications and spraying are needed, the reduced costs from fewer fungicides may not cover the costs of the system for smaller growers and will affect their bottom line.

Despite the challenges with pesticide timing some of the participants commented that they could be flexible with harvest dates or could use this model to make decisions on what products to apply weekly, instead of using the model to time an application.

Berry growers in Ontario are interested in using weather-based models to make informed decisions on pest management, and there is a growing need for conserving anthracnose fungicides with the concerns around fungicide resistance. Currently this model is not economical for most individual growers, however there is interest in pursuing options for regional monitoring or establishing a province-wide system for greater adoption of this model.

Title: *Waiting bed plants for strawberry fruit production.* E. Pate, OMAFRA; K. Schooley, Berry Growers of Ontario.

This project evaluated the potential to use mother plants for fruit production. Growbags with mother plants from a propagator were moved into an outdoor field onto raised beds. Multiple factors were evaluated during this project including the potential for this system to reduce labour requirements, reduce crop inputs, and increase profit. While there are benefits to this system including a shorter production period and reduced inputs, this system is more expensive than standard production systems (day neutrals or matted-row) and the benefits do not compensate for the increased expense. There was not a yield benefit to this system to compensate for the increased costs. There are opportunities to improve this system and increase yields and the viability of the system, however a more economical plant source is needed for this system to be feasible for growers.

Title: *Efficacy of biopesticides and new miticides for cyclamen mite in strawberry.* J. Renkema, AAFC; R. Hallett, University of Guelph.

This project is part of a larger project to test new controls and develop an integrated management system for cyclamen mite in strawberry. Strawberries were planted in May 2019, with cyclamen mites added in June. Miticides and biopesticides were applied in late June-early July. Agri-mek SC (abamectin), GWN-1708 (fenazaquin), Grandevo, Venerate, Bb Protec, EcoTrol, Vegol, and Agral 90 were tested. GWN-1708 (fenazaquin) was the most effective product and Venerate +EcoTrol were the most effective biopesticides. These products were assessed again in 2020 post-renovation. The data is currently being analyzed.

Blueberry:

Title: *Distribution of four major plant parasitic nematodes associated with highbush blueberry in Southern Ontario.* T. Sultana, AAFC; E. Pate, OMAFA; E. Thorpe, OMAFRA.

The goal of this project was to determine the occurrence and distribution of plant parasitic nematodes associated with blueberries in Southern Ontario. Most samples were positive for at least one plant parasitic nematode tested. 32% of samples were positive for dagger nematodes, a well-known vector for several viruses, which can cause blueberry decline. Not all common plant parasitic nematodes have been tested in this study and sample numbers were relatively low. A larger sampling is needed, and a follow up survey will be conducted in 2021.

Berries, Grapes:

Title: *Development of a novel method for quantifying SWD in a monitoring program in stone fruit, grapes and berries and determination of impact of SWD on stone fruit and grape varieties.* W. McFadden-Smith, OMAFRA; J. Renkema, AAFC; S. Chen, University of Guelph; J. Subramanian, University of Guelph.

Spotted wing drosophila (SWD) was monitored throughout the 2019 and 2020 growing season using liquid traps. After counting, samples were sent to the lab in 2019 for PCR testing to validate the calibrations established on lab material. Methodology was developed to quantify SWD using qPCR (quantitative polymerase chain reaction). The calibration formula is being refined in 2020 to relate physical counts to PCR results more precisely by creating a curve from degraded samples in water or an alternative liquid. The goal of this project is to develop a quick test for SWD monitoring to help growers optimize spray timing.