

Screening for *Neopestalotiopsis* spp. in Ontario strawberry varieties and F1 hybrids

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INTRODUCTION

Strawberries (*Fragaria x ananassa*) are a vital global fruit crop and a key crop in Ontario. Like most fruit crops, strawberry plants face various abiotic and biotic challenges[1]. Since 2020, *Neopestalotiopsis* spp. has been identified in Ontario through surveys conducted with OMAFRA and the Department of Plant Agriculture[3]. Due to its recent appearance in Ontario, limited information is available regarding the impact of this fungus on local growers. The development of screening techniques is essential to assess the overall pathogenicity of the fungus and identify potential resistant strawberry varieties.

RESULTS AND OBSERVATIONS

Neopestalotiopsis sp.



Neopestalotiopsis rosae



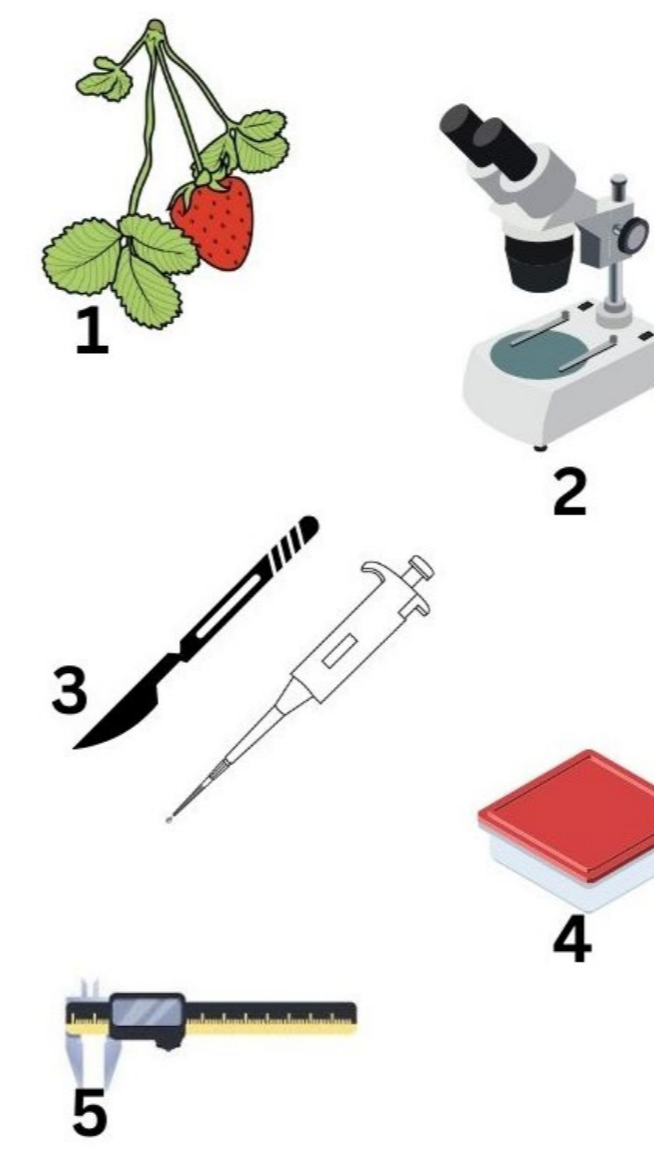
Putative *Neopestalotiopsis clavispora*



Fig 2: depicts the performance of different hybrids, including one hybrid which exhibit pronounced symptoms versus a hybrid which exhibited less pronounced symptoms, alongside the Ontario standard varieties Albion and Jewel. Each variety also had corresponding controls and buffers with distilled water. The images reveal the impact of *N. spp.*, which leads to the formation of black necrotic tissue and, in some instances, mycelia [1]. These photos were captured 14 days after inoculation.

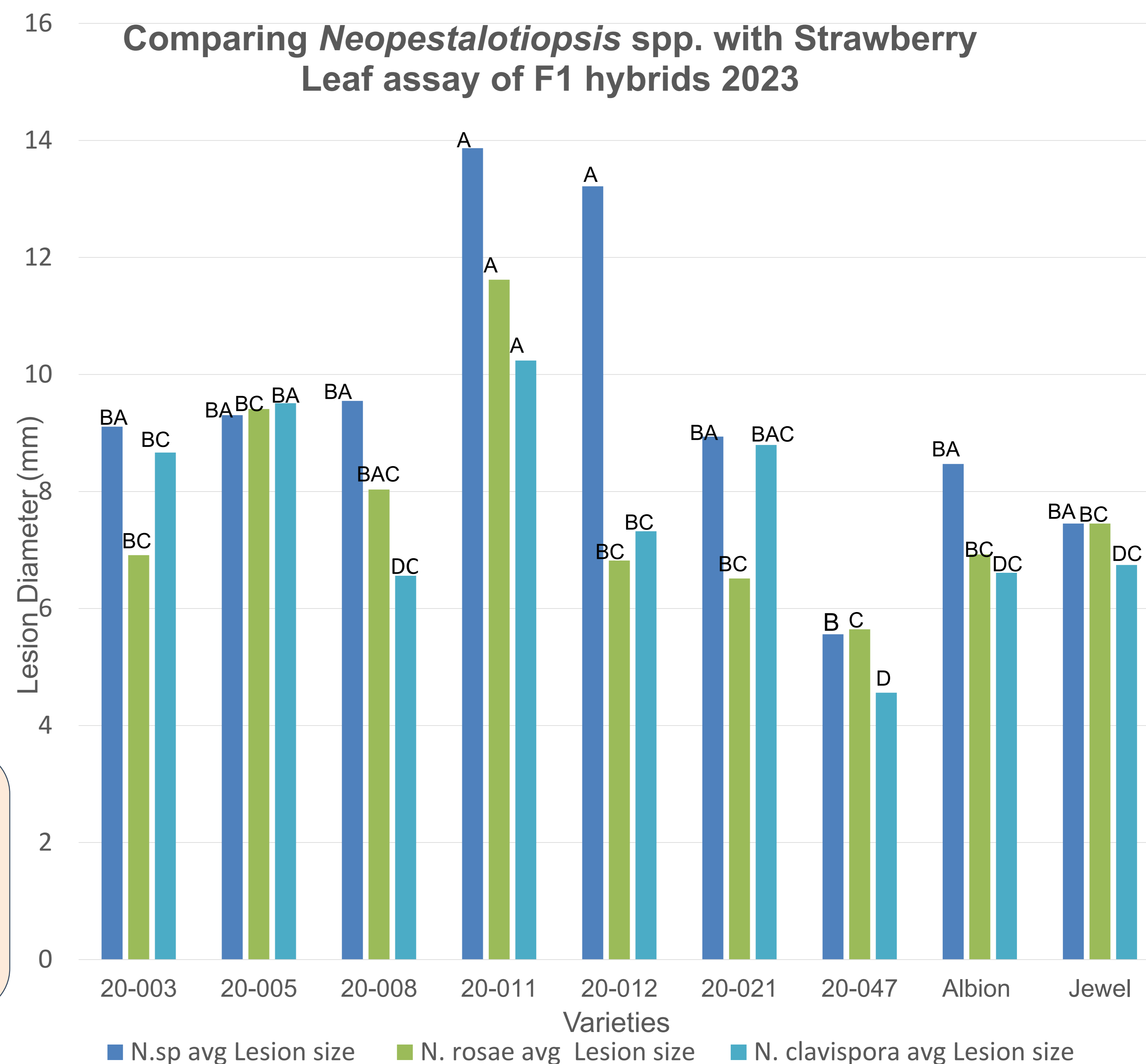
METHODS AND MATERIALS

Fig 1: Steps for Conducting a Detached Leaf Assay



- 1. Collection of F1 Hybrids:** F1 hybrids were collected throughout the summer at the Simcoe Research Centre, which were bred by Professor Emeritus Dr. Adam Dale.
- 2. Collected Strains:** Pathogen strains were cultured using PDA for up to 14 days. Spores were collected and suspended in microbial water. The spore concentration was determined using a hemocytometer.
- 3. Leaf Sterilization and Inoculation:** Strawberry leaves were sterilized with 10% hypochlorite and rinsed with distilled water. A light scraping with a scalpel created a 5mm window on the leaves to facilitate spore penetration. Inoculation was done with approximately 1×10^6 spores in a volume of 10µL on the damaged area using a micropipette.
- 4. Setting Up the Assay:** Five inoculated leaves were placed in a humidity chamber with a microfiber paper moistened to create a high moisture environment. The container was then positioned in an area with controlled lighting conditions.
- 5. Lesion Measurement:** Lesion counts were measured over a period of 10-14 days, with the largest lesion being measured using an electronic caliper.

Comparing *Neopestalotiopsis* spp. with Strawberry Leaf assay of F1 hybrids 2023



FUTURE WORK



Simcoe Research Station Strawberry Plots 2023

Similar work is being done with full plants in growth chamber. The results from the detached leaf and full plant will be correlated to compare against the *N. sp.* and see if there is any F1 varieties which stand out. To confirm putative *N. clavispora* the use of a micrometer is required to measure the overall size of the spore relative to the other species as well as the use of Kochs postulates [3].

Fig3: This experiment followed a randomized complete block design with 5 leaves collected per plant, repeated three times and in two separate experiments. The following graphs were generated in Excel, with the data analyzed using SAS9 and Proc Glimmix, employing a Tukey Test at a significance level of 0.05. F1 hybrids susceptibility. Among the three strains, *N. sp.* is the most aggressive, and the best-performing variety was 20-047 in this graph, surpassing both Ontario standards, Albion and Jewel. However, 20-011 and 20-012 were the poorest-performing hybrids in terms of overall performance. Notably, among the Ontario standards, the June-bearing variety, Jewel, performed slightly better in the presence of *N. sp.*, consistent with existing literature but wasn't statistically different with the other species[2].

Acknowledgements:

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References:

- [1] Baggio J.S., et al. 2021. Plant Dis, 105:305-315
- [2] Guan W., et al. 2023 Plant Health Prog, 24:135-139
- [3] McNally J., et al 2023 New Dis Rep 48:12210

