

Pest Alert: *Neopestalotiopsis* – an emerging strawberry disease in North America

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All strawberry growers should be scouting for this new disease. Researchers in Florida have identified a new fungal pathogen in the *Neopestalotiopsis* genus as causing severe disease outbreaks in Florida strawberry fields since 2017. Additional reports from several other regions in North America have identified this disease as causing severe leaf blighting, fruit rot and crown rot on strawberries, including New Jersey, Georgia and Mexico (see reference links).

In the fall of 2020, *Neopestalotiopsis* symptoms were seen at a single location in Ontario on crowns and foliage of the cultivar 'Albion'. The disease was present in two fields, one transplanted in 2019 (Figure 1) and one transplanted in 2020 (Figure 2). DNA sequencing performed at the University of Guelph confirmed that the isolates were the more aggressive *Neopestalotiopsis* species, previously identified in Florida. All strawberry growers and consultants should be on the lookout for this disease in the spring, as it has shown to be economically damaging in other jurisdictions.



Figure 1. *Neopestalotiopsis* on 2019 fall transplanted 'Albion' a) plant death, b) leaf spots in the field c) black structures of the fungus produced when in a humid, warm environment



Figure 2. *Neopestalotiopsis* on 2020 fall transplanted 'Albion' strawberries

Neopestalotiopsis species can infect all parts of the strawberry plant – fruit, leaves, petioles, crown and roots. On leaves, look for small leaf spots with a light centre and slightly darker border that expands and becomes irregular in shape (Figure 1b&3a). Under ideal conditions, dark black structures of the fungus can be seen on the upper leaf (Figure 1c). To favour conditions for these structures to grow, place symptomatic leaves sampled the field in a sealed bag with a damp paper towel and leave at room temperature for a few days.

Fruit lesions are initially small (2-4mm), light brown and irregular (Figure 3b). Lesions can grow and form a black coating which are black fruiting bodies of the fungus (Figure 3c). Eventually, the whole fruit may be rotted and mummified. Crown and root rot symptoms are similar to what would be seen from *Colletotrichum* or *Phytophthora* species.



Figure 3. *Neopestalotiopsis* sp. in Florida strawberries a) leaf blighting symptoms. b) early symptoms of fruit rot and c) late symptoms of fruit rot. Photos courtesy of Dr. Natalia Peres, University of Florida

The leaf blighting phase of this disease has been often confused with common leaf spot (*Mycosphaerella fragariae*), the difference is common leaf spot will have a tan centre with a darker/purple outer zone (Figure 4a). Another commonly confused disease is leaf scorch (*Diplocarpon earlianum*, *Marssonina fragariae*) but leaf scorch lesions are mainly dark without a tan centre (Figure 4b). Phomopsis leaf blight (*Phomopsis obscurans*) can often be confused especially when the lesions are larger, but Phomopsis lesions are more reddish-purple lesions with a dark outer zone (Figure 4c). Of these diseases, only the new *Neopestalotiopsis* sp. can cause fruit rot if infection is severe. Sending samples to a plant pathology diagnostic lab can confirm which pathogen is causing leaf spots.



Figure 4. Leaf diseases in Ontario strawberries a) common leaf spot, b) leaf scorch, c) Phomopsis leaf blight

Pathogens in the *Neopestalotiopsis* genus are not necessarily new to strawberry production, as a closely related pathogen has been identified on strawberry crowns and roots in many strawberry production regions including Quebec. This pathogen group has previously been identified as

Pestalotiopsis but has recently been reclassified as *Neopestalotiopsis*. Reports of this pathogen often considered it weak or secondary as it was found mainly in plant under stress (poor growing conditions, other pests, physical damage, etc.). In Florida, the recent severe outbreaks on leaves and fruit are believed to be caused by a new species in the *Neopestalotiopsis* genus. The isolates from the single location in Ontario are the same new species, we can expect there to be significant damage in fields where no management is taken to control this disease.

For disease to occur, the environment needs to also be favourable for infection from the pathogen. *Neopestalotiopsis* sp. prefer warm and humid conditions like anthracnose. Ideal temperature for growth is 25°C, but temperatures that range from 15 to 30°C are still favourable for growth and sporulation. Moisture from high humidity and rain are favourable for infection. Spores from *Neopestalotiopsis* sp. are primarily spread via water splashing from overhead irrigation and rain and working when plants are wet. There is local research needed on survival and epidemiology as it is likely able to overwinter in cold temperatures.

In Florida, management strategies are being researched including cultivars and fungicides. Preliminary studies on cultivars have shown little to no host resistance in current commercial cultivars. No fungicides are registered in Canada for this disease. In Florida, fungicide efficacy studies on fruit and leaf infection show partial suppression from few products. Further trials are on-going to test fungicide products. More research is needed in Ontario to understand the pathogen and integrated management strategies for this new disease.

Our plan this summer is to monitor the occurrence and severity of the disease in infected fields and this information will help us to provide information on how the pathogen is moving, transmission, and overwintering status. If you suspect a disease caused by *Neopestalotiopsis* sp. in your field, you can contact Erica Pate (Erica.pate@ontario.ca; 519-410-0624) or Katie Goldenhar (katie.goldenhar@ontario.ca; 519-835-5792).

References & Additional Information

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