Attack of Boxwood Blight in Canada

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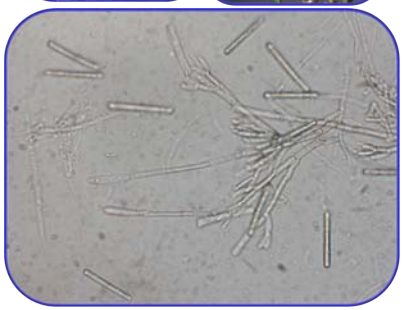
What this research is about

▪ A new fungal pathogen, *Cylindrocladium buxicola*, which causes severe disease on boxwood plants was recently found in the U.S. and Canada in 2011 and is causing great concerns for nursery growers in Canada, specifically in Ontario. All nurseries in southern Ontario are currently under a biosecurity alert.

▪ The objectives of our research are as follows:

1. To find the optimal growing conditions of Ontario fungal isolates and to determine susceptibilities of boxwood cultivars
2. To study the processes by which the fungus infects the plant and to develop protocols for the detection of *C. buxicola*
3. To find effective chemical control methods for box blight



What the researchers did

▪ Whole boxwood plants with symptoms of box blight were received from Ontario nurseries. The leaves and stems from infected plants were surface sterilized and plated onto media to isolate *C. buxicola*

▪ To find optimal growth conditions, several isolates of *C. buxicola* from different geographic regions were studied at multiple temperatures

▪ To assess the susceptibility of different boxwood cultivars grown in Ontario, the fungus was placed onto healthy boxwood tissue. Also pachysandra was tested as a potential host

▪ The survival of *C. buxicola* over time on infected leaves under dry lab conditions was tested along with survival in the field where infected leaves were buried to different depths

▪ The genome of *C. buxicola* was sequenced to obtain unique DNA sequences for the specific detection of the presence of the fungus in boxwood leaves displaying no visible symptoms

▪ Several Fungicides were tested for efficacy against *C. buxi*cola on detached leaves and on whole plants . Both curative and preventative tests were conducted

What the researchers found

▪ The fungus was successfully re-isolated from symptomatic leaf and stem tissue from the cultivar 'Green Mountain' in early 2012, showing that *C. buxicola* is present in Ontario

▪ The fastest growth rate of *C. buxicola* was at 20 ° C with little growth below 4 ° C or above 30 ° C

▪ Recovery of this fungus from inoculated symptomatic pachysandra leaves suggests that Pachysandra could be a potential host. The boxwood cultivar 'Green Mountain' was least susceptible to infection by *C. buxicola*

▪ The infection cycle can be completed in less than 7 days, however some form of injury on whole plants is required for the effective establishment of the fungus

▪ Under dry lab conditions the fungus can remain viable for over a year. In the field, the fungus does not easily survive on fallen leaves over the winter, but can survive on fallen leaves for several months in the fall.

▪ DNA tests designed from unique genes can be used to detect *C. buxicola* at very low levels from non-symptomatic leaves. Whole genome sequencing revealed the possibility of sexual reproduction

▪ Preliminary fungicide studies have shown control for two weeks after initial fungicide treatment

▪ These results provide insight on the optimal conditions for growth and survival of *C. buxicola* as well as potential management methods in a nursery setting . Evidence of sexual reproduction emphasizes the potential threat of box blight

What you need to know

▪ The importance of these results for the nursery industry is the confirmation that this disease has been found in Ontario and therefore poses a threat to nurseries selling or growing boxwood. This research also provides more information on the basic biology and growing conditions of *C. buxicola*, highlighting how rapidly the infection cycle can be completed and how long the fungus remains viable which is concerning if the disease becomes established in a nursery setting.

▪ The possibility of sexual reproduction between isolates can result in more virulent isolates and can result a greater risk for nursery growers.

▪ Our ongoing research in collaboration with Landscape Ontario can provide management methods to control box blight if it does become established, specifically regarding the effective fungicides and the cultivars of boxwood which are least susceptible to disease.

To know more

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