Association of *Diaporthe longicolla* with sunflower

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Introduction

Diaporthe longicolla (Hobbs) Santos, Vrandecic and Phillips is the primary cause of Phomopsis seed decay of soybean that can affect the seed quality and oil content (Li et al. 2015). In 2016, *D. longicolla* was recovered from sunflower roots in Brookings County, South Dakota. The objective of this study was to investigate the potential of *D. longicolla* as a root pathogen of sunflower.

Materials and Methods

- Experiment was set up in a completely randomized design with three treatments and three plants per treatment. Sunflower cv. HA 288 was used.
- Three treatments included – (1) *D. longicolla* 303 (Brookings, SD); (2) *D. longicolla* 204 (Brookings, SD); and (3) *D. helianthi* 006 (Sully, SD).
- Sunflower seedlings were inoculated at 2 and 4 weeks old using one of the four inoculation methods (two wounding and two non-wounding).
- The two wounding methods included the root dip method (Alkher et al. 2009; Radi and Gulya 2007) and a wound method (Mathew et al. 2015; Thompson et al. 2011).
- The two non-wounding methods included the root dip method (Khangura and Aberra 2009) and the mycelium contact method (Thompson et al. 2011).
- At 49 days after inoculation, vascular discoloration was rated on a 0-5 scale (Alkher et al. 2009), where 0 = no vascular discoloration, 1 = trace to <9% vascular discoloration, 2 = 10-24%, 3 = 25-49%, 4 = 50-74%, and 5 = 75-100% discoloration.

Table 1. Vascular discoloration ratings of sunflower roots 49 days after inoculation.

Inoculation Methods	Vascular Discoloration at VE (0-5)	Vascular Discoloration at V4 (0-5)
Mycelium Contact (non-wounding)		
D. helianthi	1	5
D. longicolla 303	1	1
D. longicolla 204	0	1
Wound (wounding)		
D. helianthi	1.5	4.5
D. longicolla 303	0	1
D. longicolla 204	1	1
Root dip (non-wounding)		
D. helianthi	0	0
D. longicolla 303	0	0
D. longicolla 204	0	0.5
Root dip (wounding)		
D. helianthi	0	0.5
D. longicolla 303	0	0
D. longicolla 204	0	0

Figure 1. At VE, 49 days after plants were inoculated via the wound method with *D. helianthi* (left) and *D. longicolla* (right).

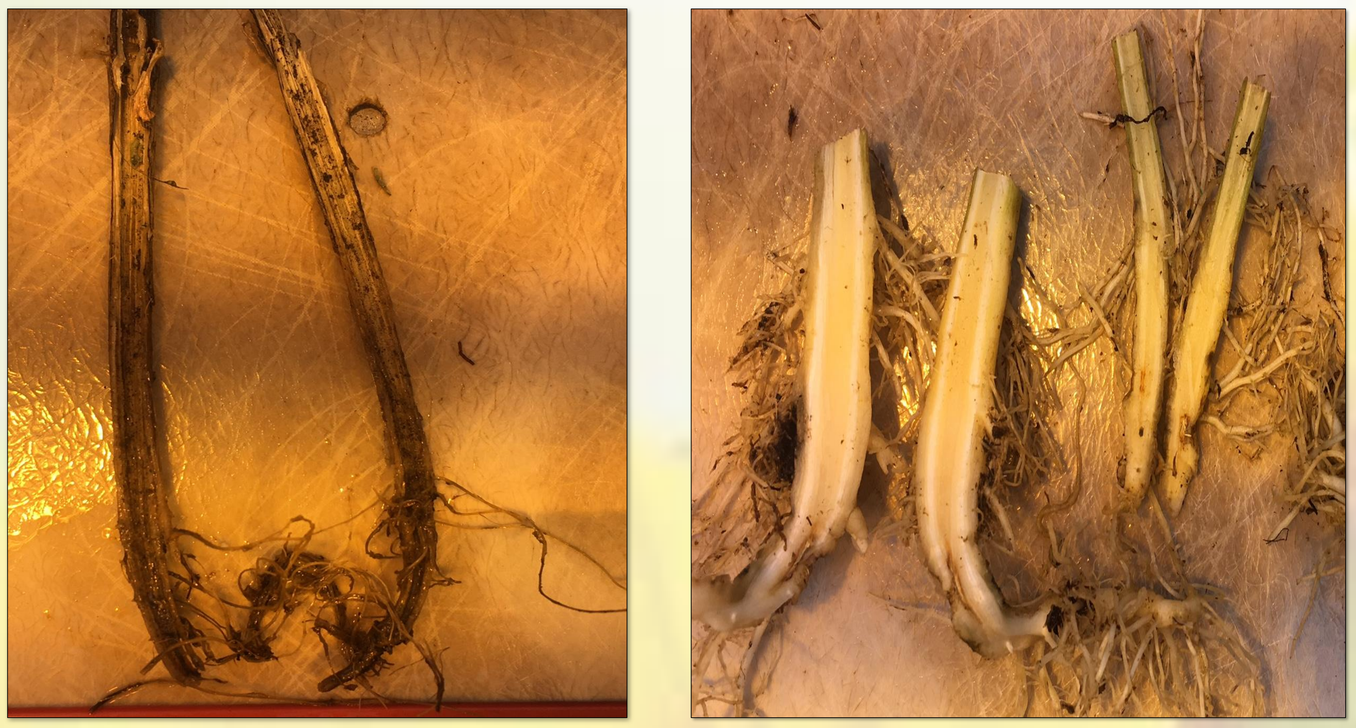

Figure 2. At V4, 49 days after plants were inoculated via the wound method with *D. helianthi* (left) and *D. longicolla* (right).

Summary

- No vascular discoloration developed in the roots of the plants inoculated at VE and V4 with *D. longicolla* using any of the inoculation methods. However, visible vascular discoloration was observed in sunflower roots inoculated with *D. helianthi* via the wound method and mycelium contact method.
- Preliminary results suggest *D. longicolla* is not a root pathogen of sunflower.

Literature cited

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