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Phomopsis Update: Disease in 2010, limited disease in fungicide trials, and identifications of pathogens

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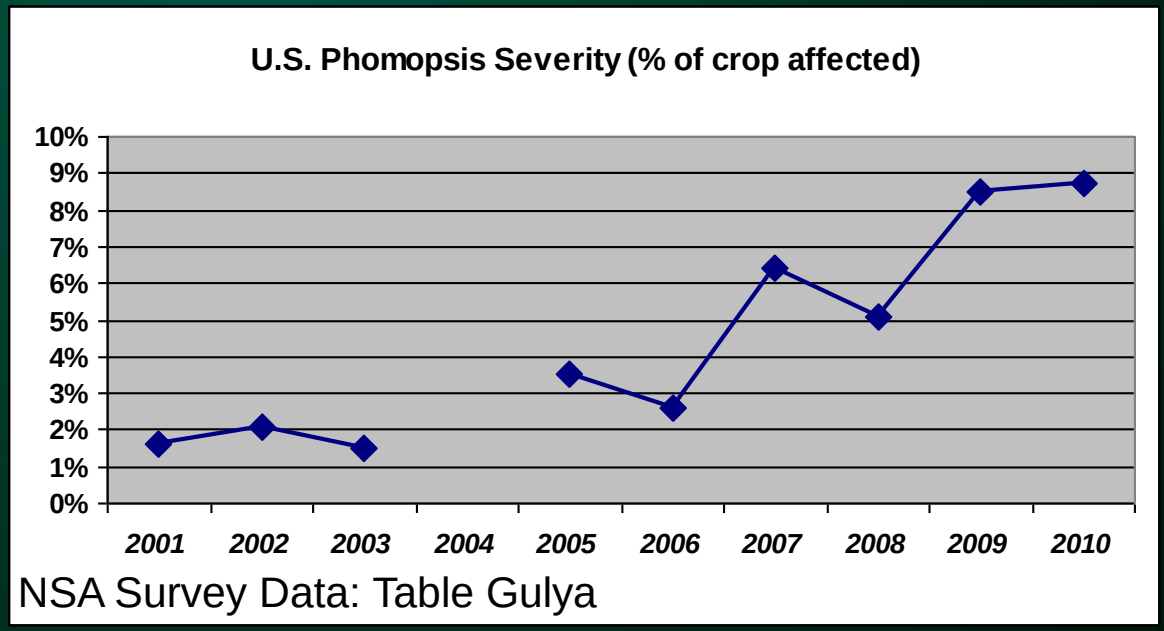
Importance of Phomopsis

- First identified in Europe
- Incidence and Severity on the rise in the U.S.
- Girdling Lesion, Rotten Pith, Lodging
  - 40% yield losses – France
  - 50-80% incidence in Yugoslavia
    - High Yield Losses



NSA Survey Data: Table Gulya

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Phomopsis

- Pathogen overwinters in debris
- Perithecia
  - Spores released
  - Splash and wind dispersed
  - Leaf → petiole → stem (1 month)
- Caused by *Phomopsis helianthi* (tel. *Diaporthe helianthi*)
  - Other species could be involved in disease overseas
- ‘New’ Species identified in Australia*

Thompson et al. 2010 2010 Summer Grains Conf. Qld Australia

Fungicide Trials in 2010

- Inoculated with Infested residue (2009)
- Supplemental water
- Timing Trial
  - Three Timings, Fenpropimorph
- Efficacy Trial
  - 8 Treatments (labeled and not-labeled)

Carrington 2010 – Fungicide Trial

Treatment	Rate	Phomopsis Severity	Yield lb/A
Non-Treated		0 a	1311 a
Headline	6 fl oz	0 a	1157 a
Quadris	6 fl oz	0 a	1286 a
Tebuzol	4 fl oz	0 a	1374 a
Proline	5.7 fl oz	0 a	1290 a
Fenpropimorphe	10.95 fl oz	0 a	1515 a
Endura	6 oz	0 a	1207 a
Quash	4 oz	0 a	1339 a
LSD (P=0.05)		0.00	392
CV		N/A	20.32

Objective

Identify Phomopsis species observed in 2010 in the Northern Great Plains

Methods

- About 70 isolates obtained from infected stalks
  - Mathew, Friskop, Gulya, Alananbeh, Industry, Myself, Heitkamp
- DNA extracted (Promega)
- ITS region amplification (PCR)
  - ITS5 / ITS4 primers (White et al. 1990)
- Sequenced (McLab)
- Sequence analysis BLASTN
  - NCBI database
- Reference species obtained via GenBank (Ash *et al.* 2010; Says-Lesage *et al*., 2002)
- Sequence alignment and phylogenetic analyses using MEGA 4.0
- Neighbor Joining tree- 1000 bootstrap replicates

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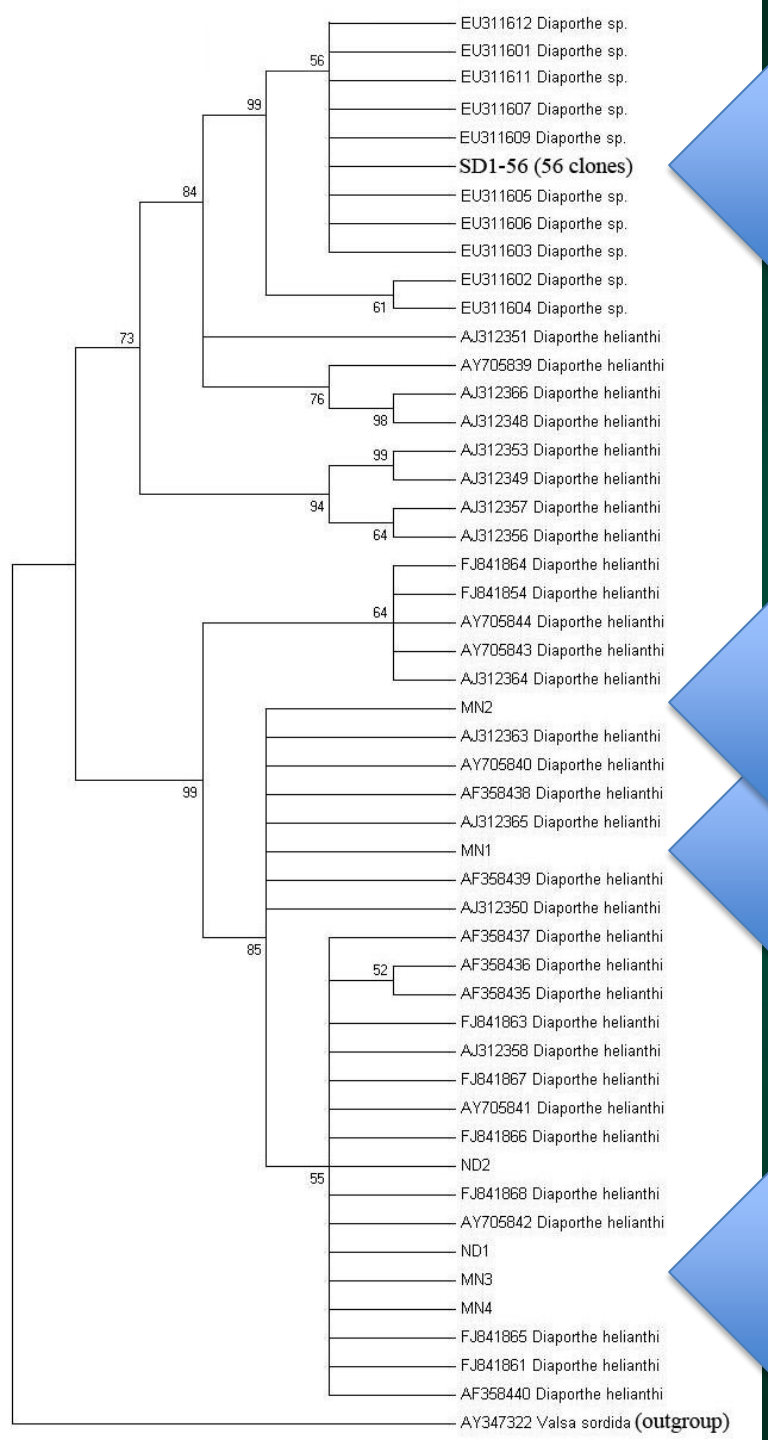


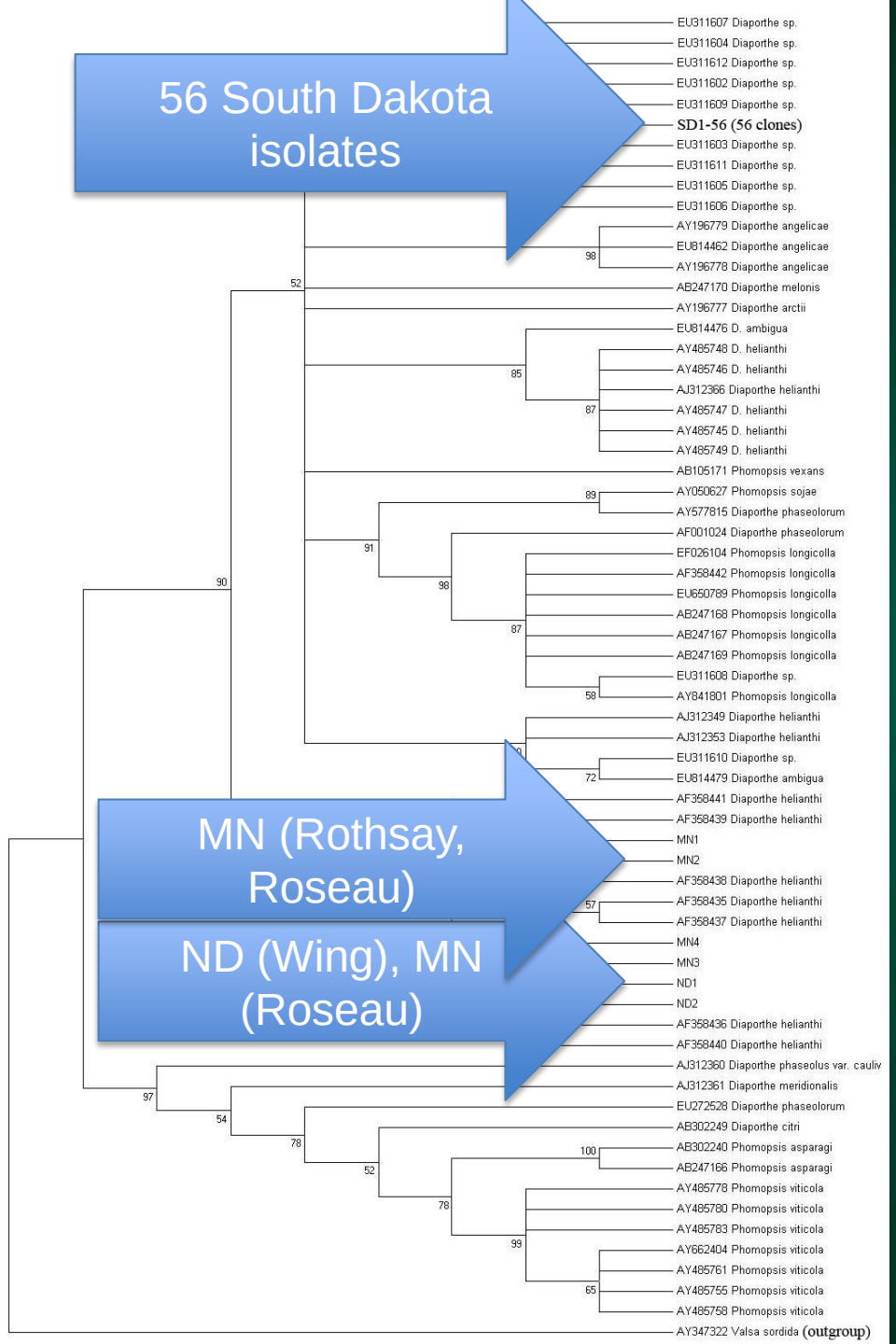
56 South Dakota isolates

MN (Rothsay)

MN (Roseau)

ND (Wing), MN (Roseau)

Outlier (*Valsa sordida*; Ash 2010)



New Australian Species (Sunflower)

D. helianthi (Sunflower)

D. phaseolorum (Soybean)

P. longicolla (Soybean)

D. helianthi (Sunflower)

P. Viticola (Grape)

Preliminary Results and Questions

- There are *two species* causing phomopsis on sunflowers in the United States
  - Have we always had this?
  - Did we bring in a new species?
  - Is this related to the increase in disease?
  - Will this impact genetics for resistance?

Summary

- Phomopsis is increasing
- Fungicide Trials for Phomopsis have been a challenge
- We have two populations of Phomopsis in the United States

Acknowledgments

- Scott Halley
- Michael Wunsch
- Blaine Schatz
- Febina Mathew
- Chris Wharam
- Tom Gulya
- Febina Mathew
- Eric Heitkamp
- Kholoud Alananbeh
- Tom Gulya

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