

## Disease trends in the NSA survey: 2002-2015

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EXTENDING KNOWLEDGE >> CHANGING LIVES

NDSU

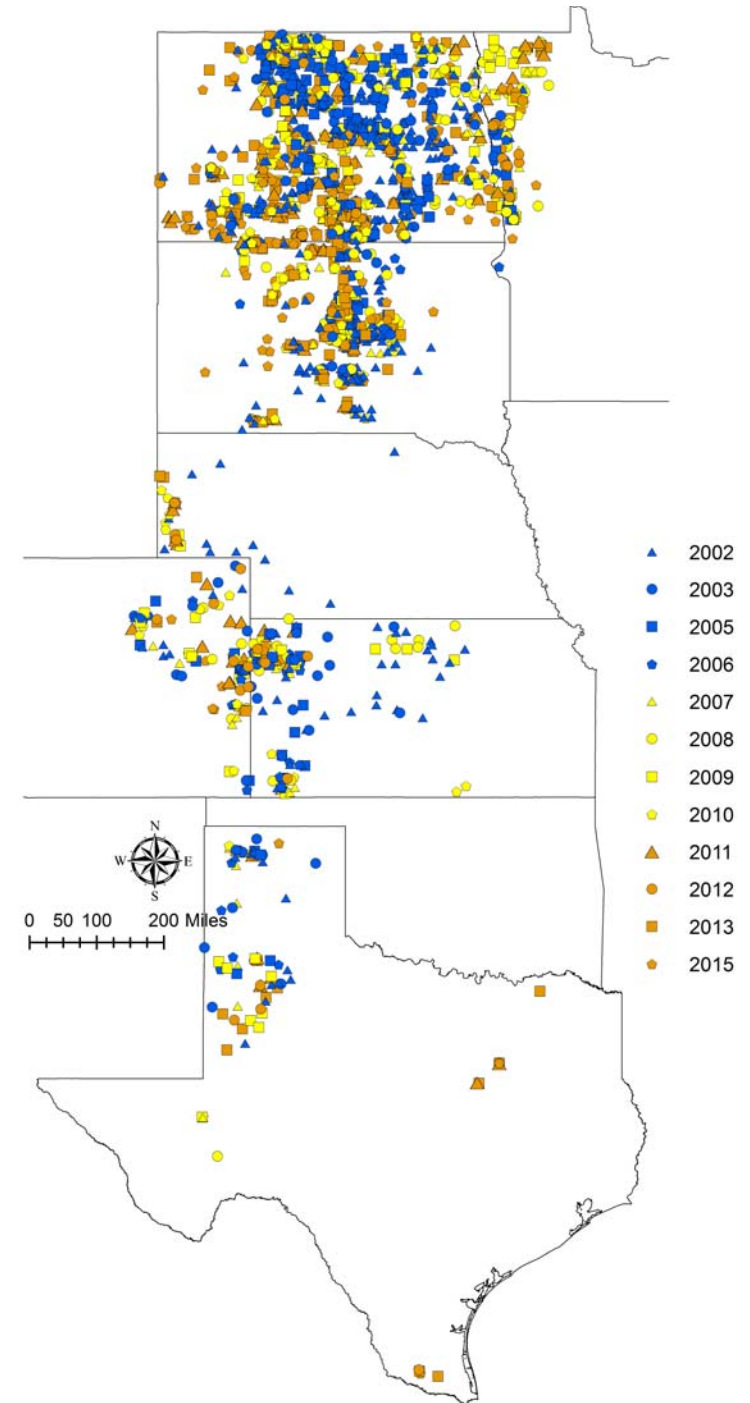
EXTENSION

# Sunflower Survey

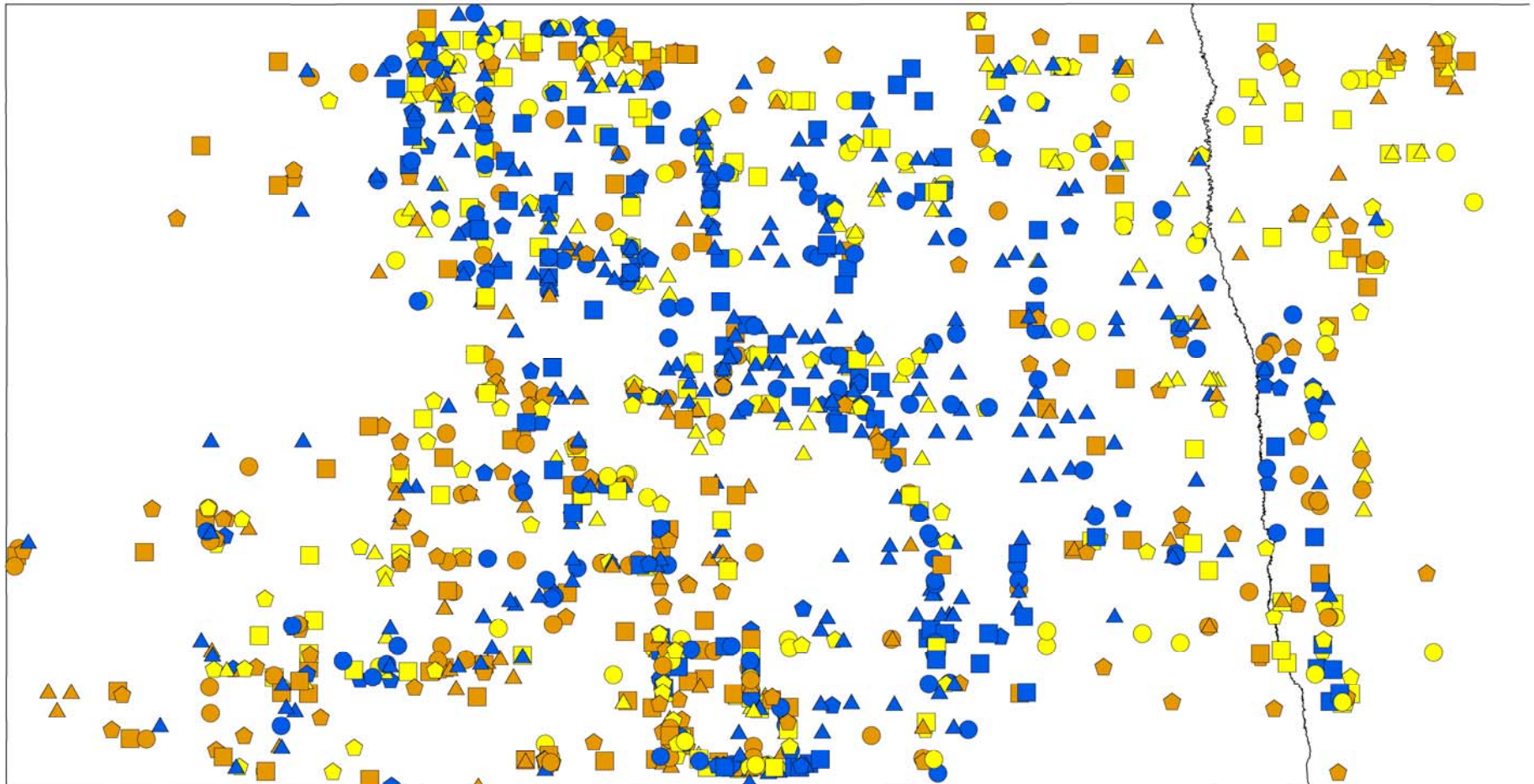
- National
- Yield and factors contributing to yield
- Teams and trainings
- 2002 – 2003, 2005 – 2013, 2015
- 2,267 fields

# Techniques

- 2,267 fields
  - One field / 10,000 acres
  - Two locations within each field
  - 50 plants per field
- Four geographic regions



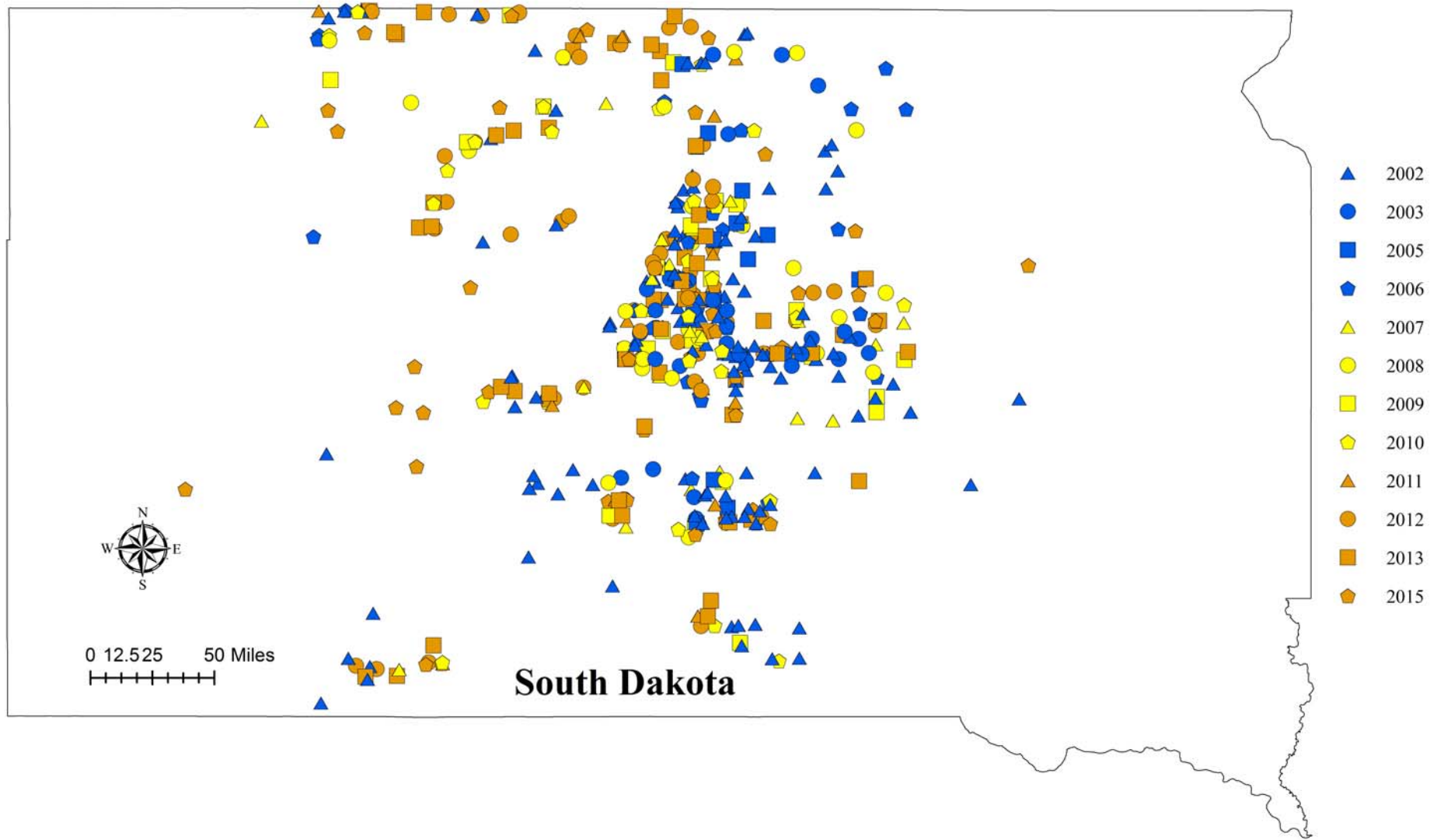
# North Dakota



0 25 50 100 Miles

- |   |      |   |      |
|---|------|---|------|
| ▲ | 2002 | ■ | 2009 |
| ● | 2003 | ◆ | 2010 |
| ■ | 2005 | ▲ | 2011 |
| ◆ | 2006 | ● | 2012 |
| ▲ | 2007 | ■ | 2013 |
| ● | 2008 | ◆ | 2015 |

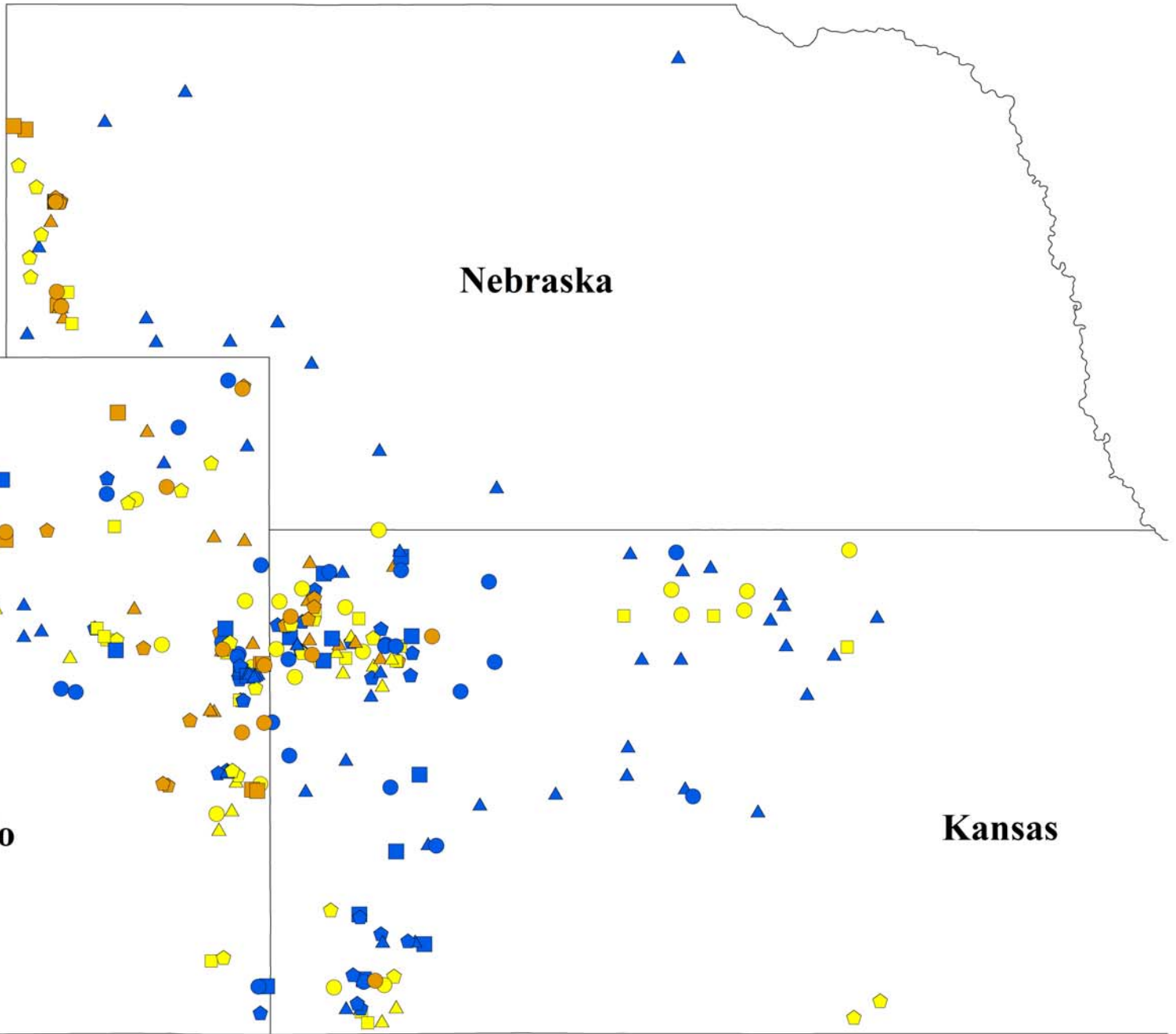
Minnesota





0 20 40 80 Miles  
|-----|-----|-----|-----|

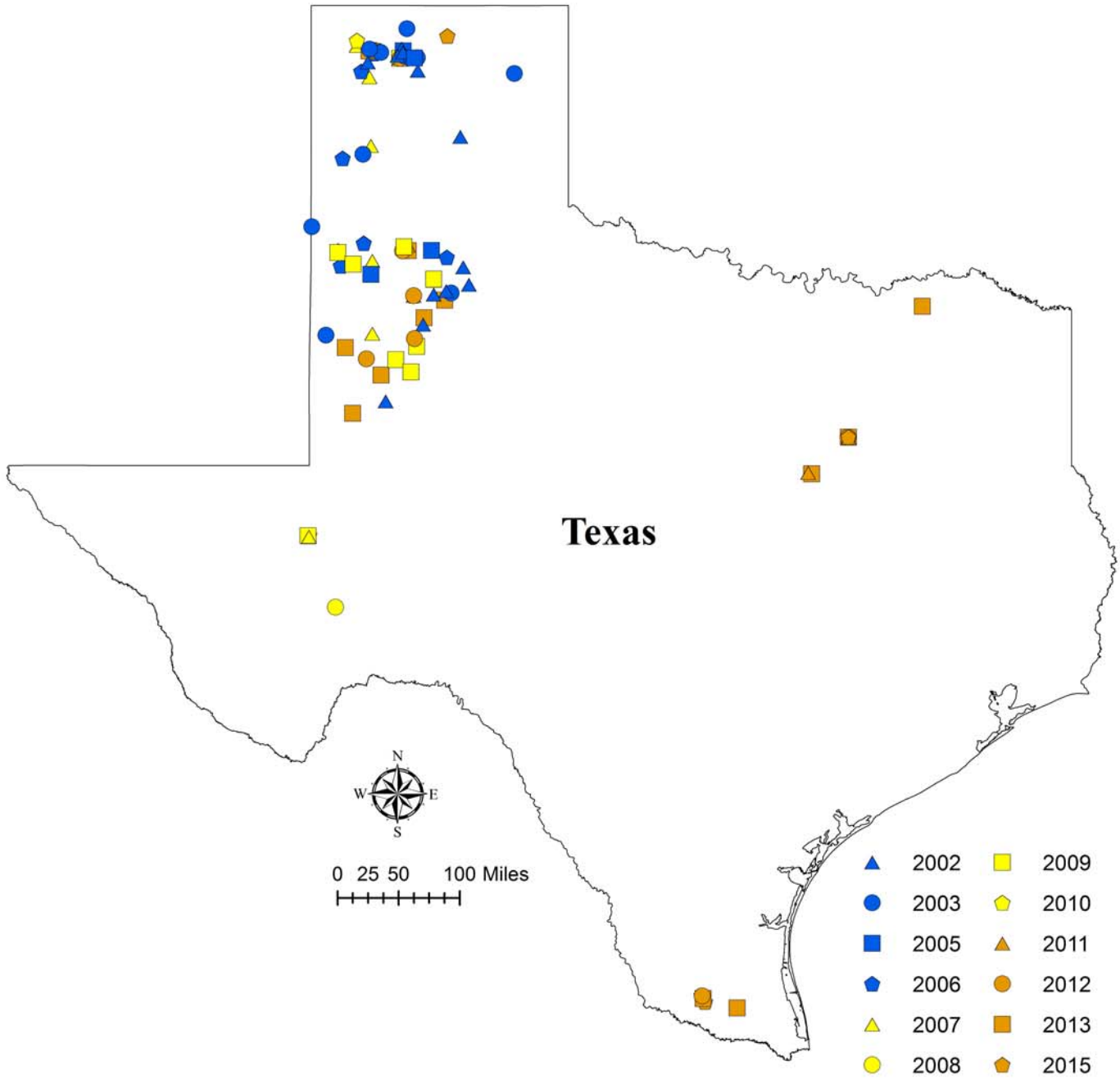
- |        |        |
|--------|--------|
| ▲ 2002 | ■ 2009 |
| ● 2003 | ◐ 2010 |
| ■ 2005 | ▲ 2011 |
| ◑ 2006 | ● 2012 |
| ▲ 2007 | ■ 2013 |
| ● 2008 | ◑ 2015 |



Nebraska

Colorado

Kansas



# Disease trends

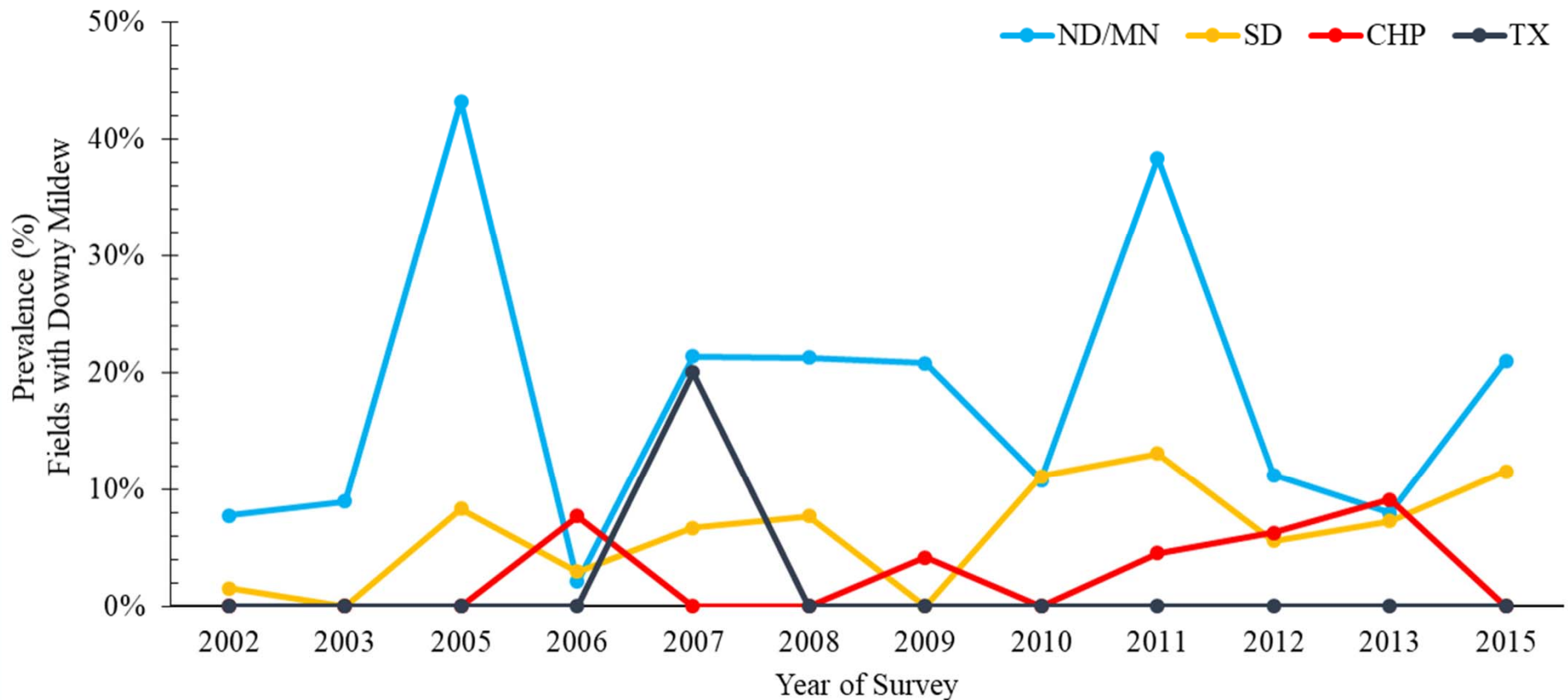
- 9 to 10 diseases surveyed
- Top 5
  - Downy Mildew, Rust, Sclerotinia HR, Rhizopus HR and Phomopsis Stem Canker
- *Prevalence* – Present / absent in a field
- *Incidence* – Percent plants in a field infected
- *Severity* – Percent damage on the plant (rust only)



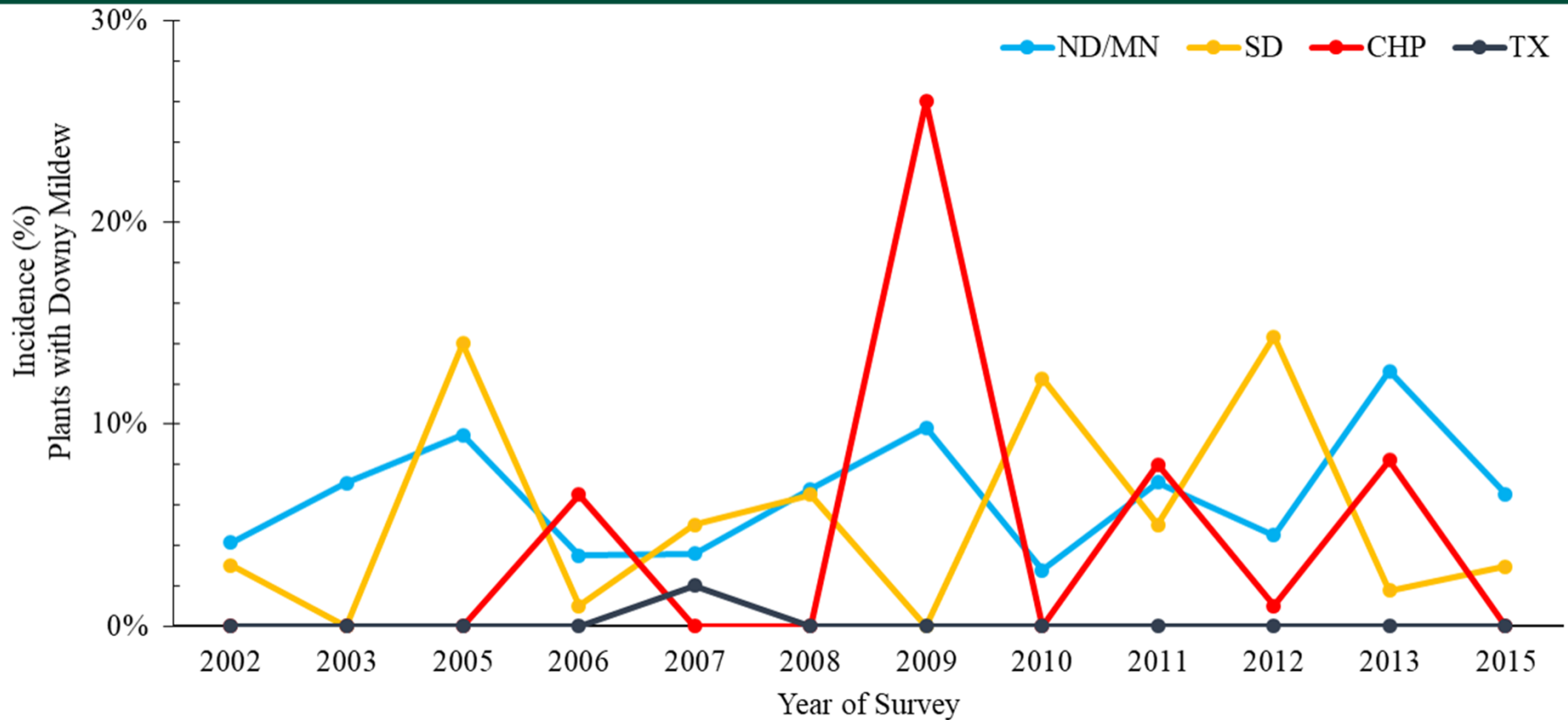
# Downy Mildew



# Prevalence of sunflower downy mildew



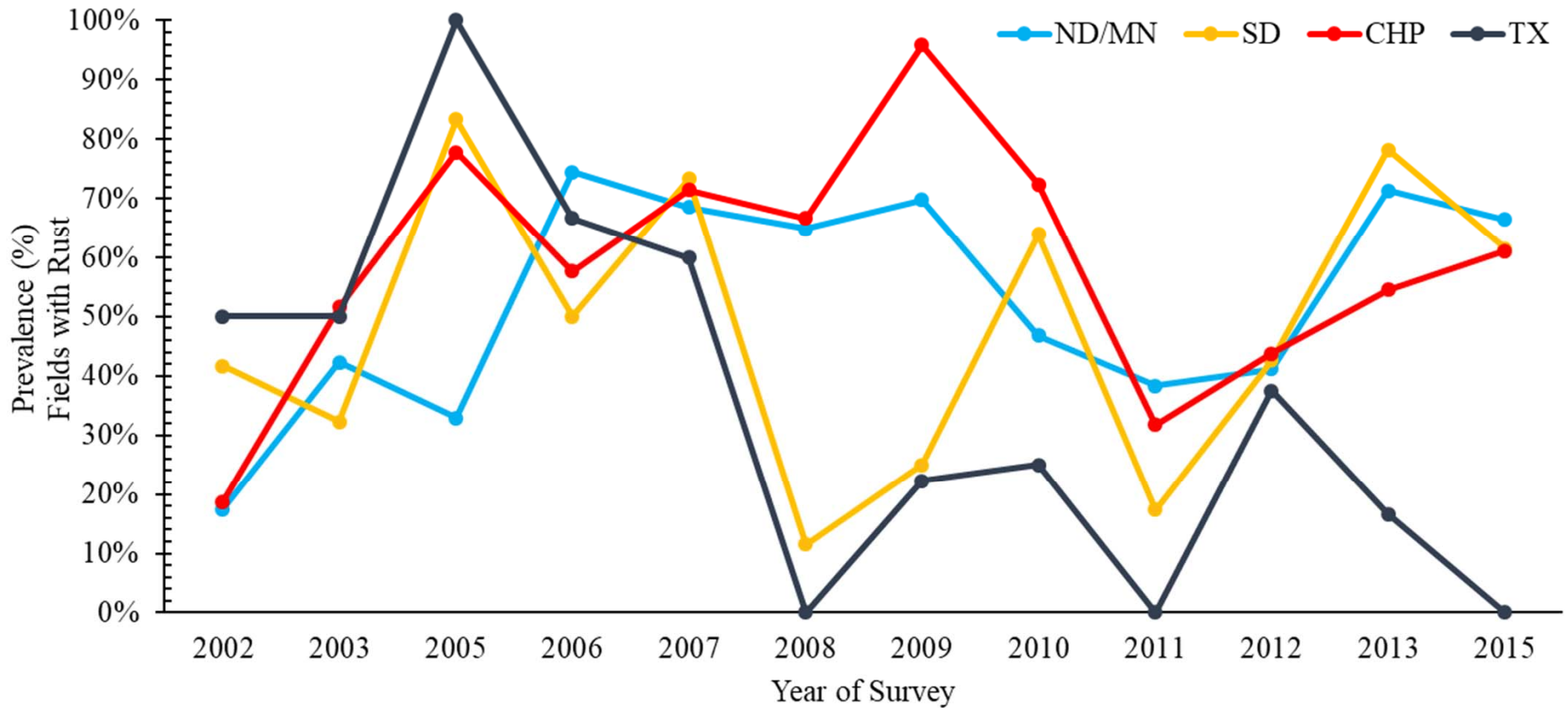
# Incidence of sunflower downy mildew



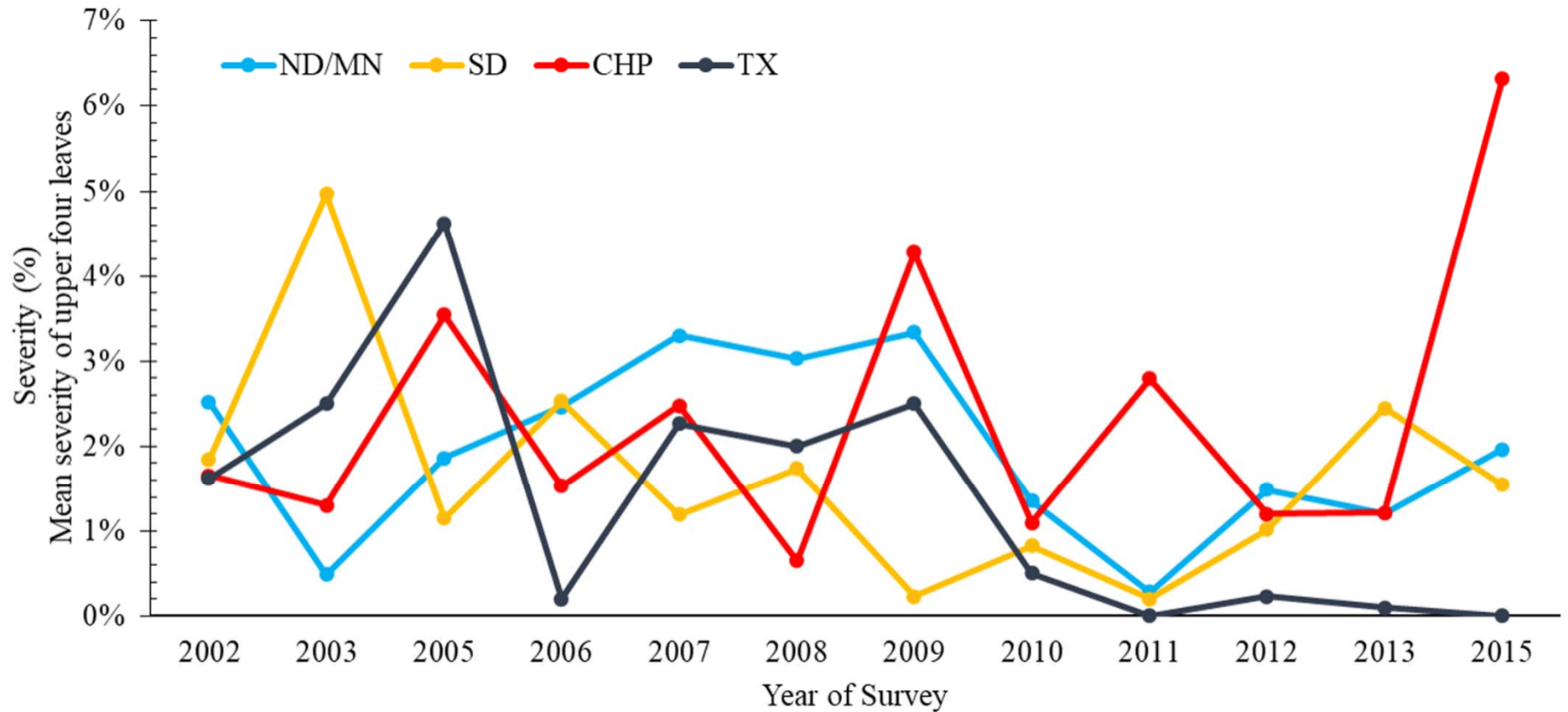
# Rust



# Prevalence of sunflower rust



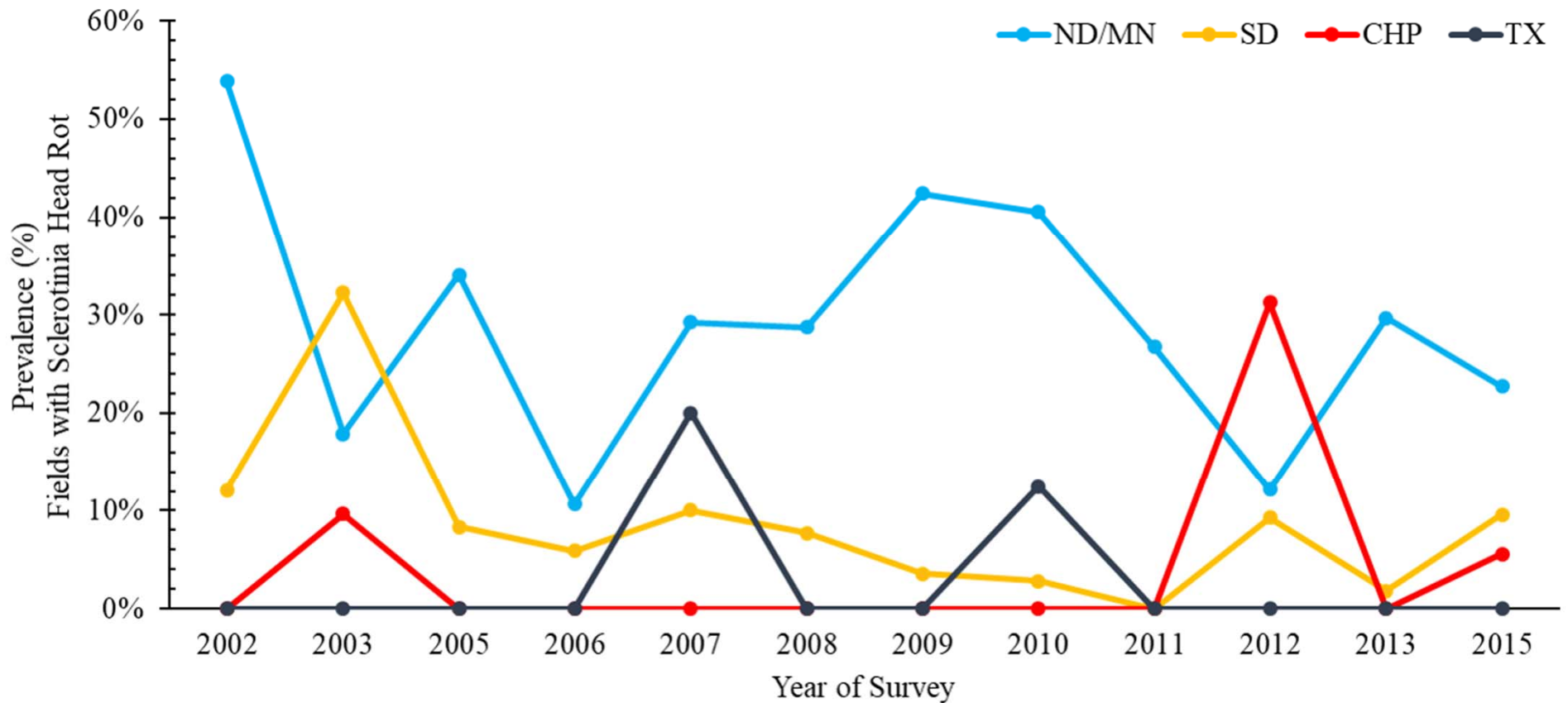
# Severity of sunflower rust



# Sclerotinia head rot

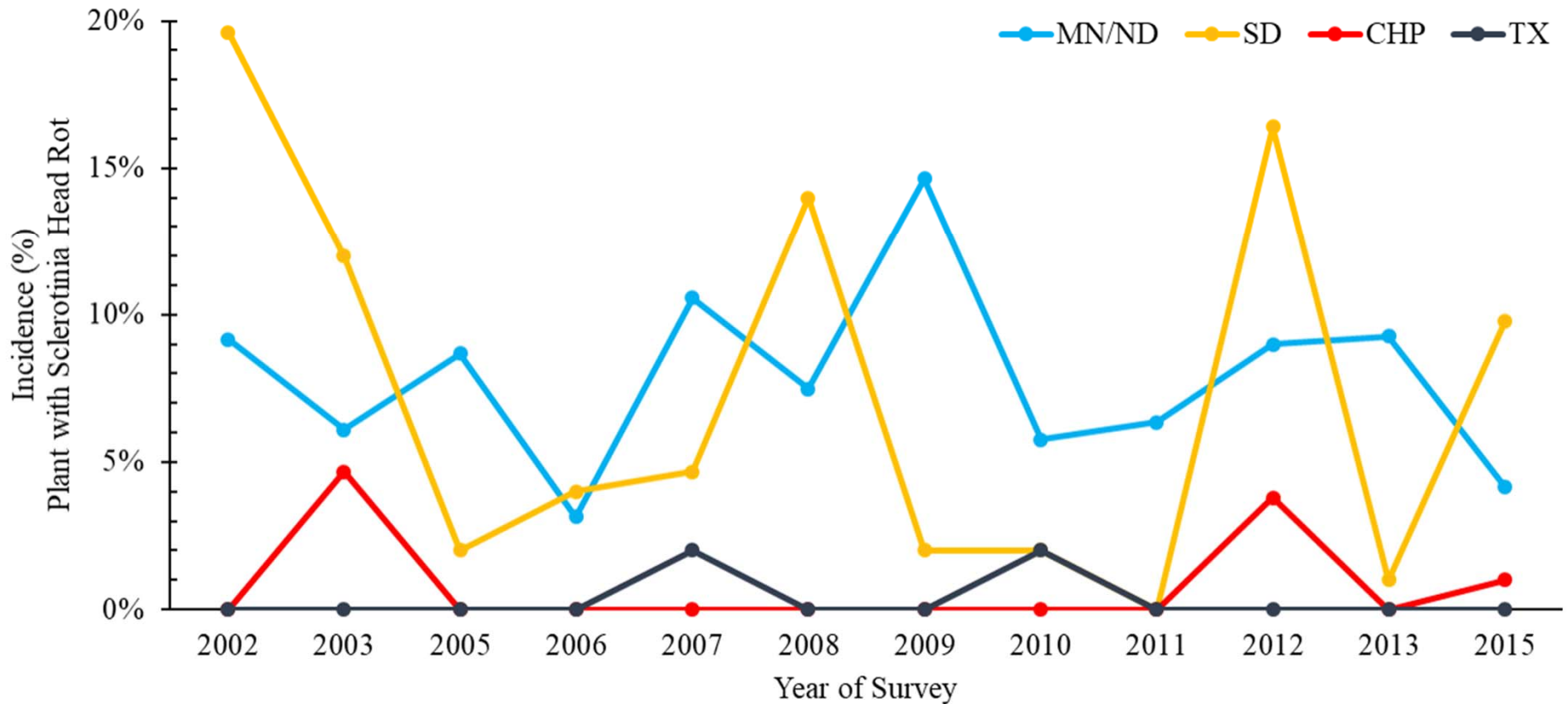


# Prevalence of Sclerotinia head rot





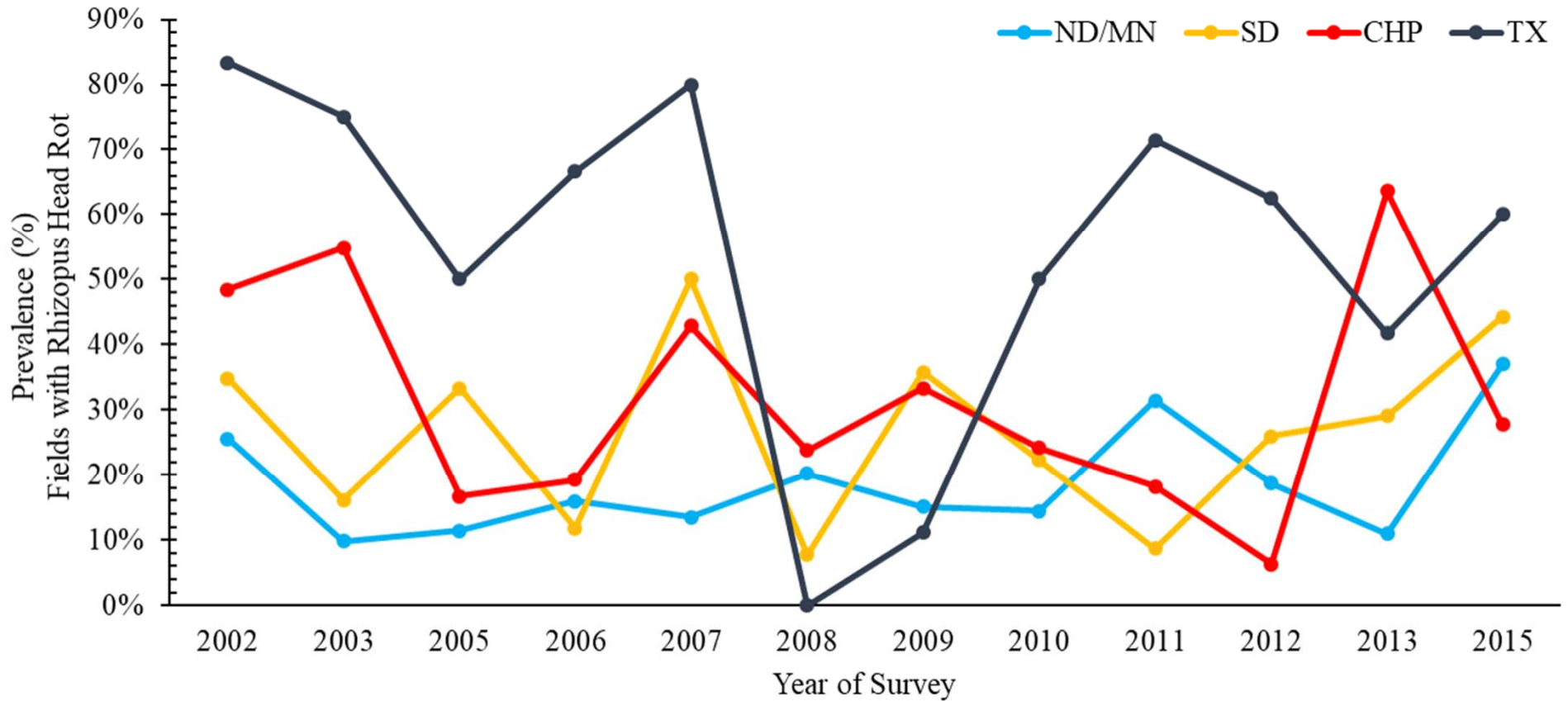
# Incidence of Sclerotinia head rot



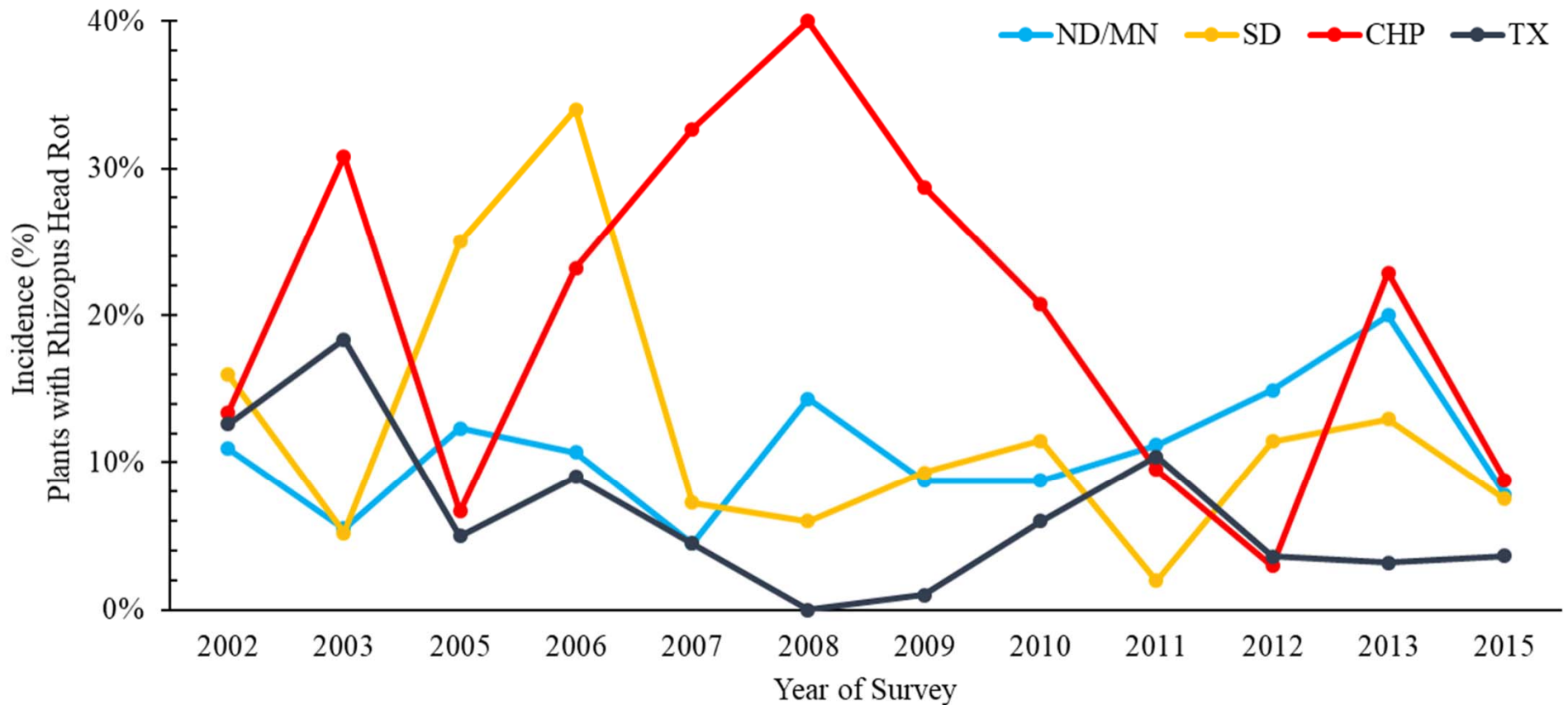
# Rhizopus head rot



# Prevalence of Rhizopus head rot



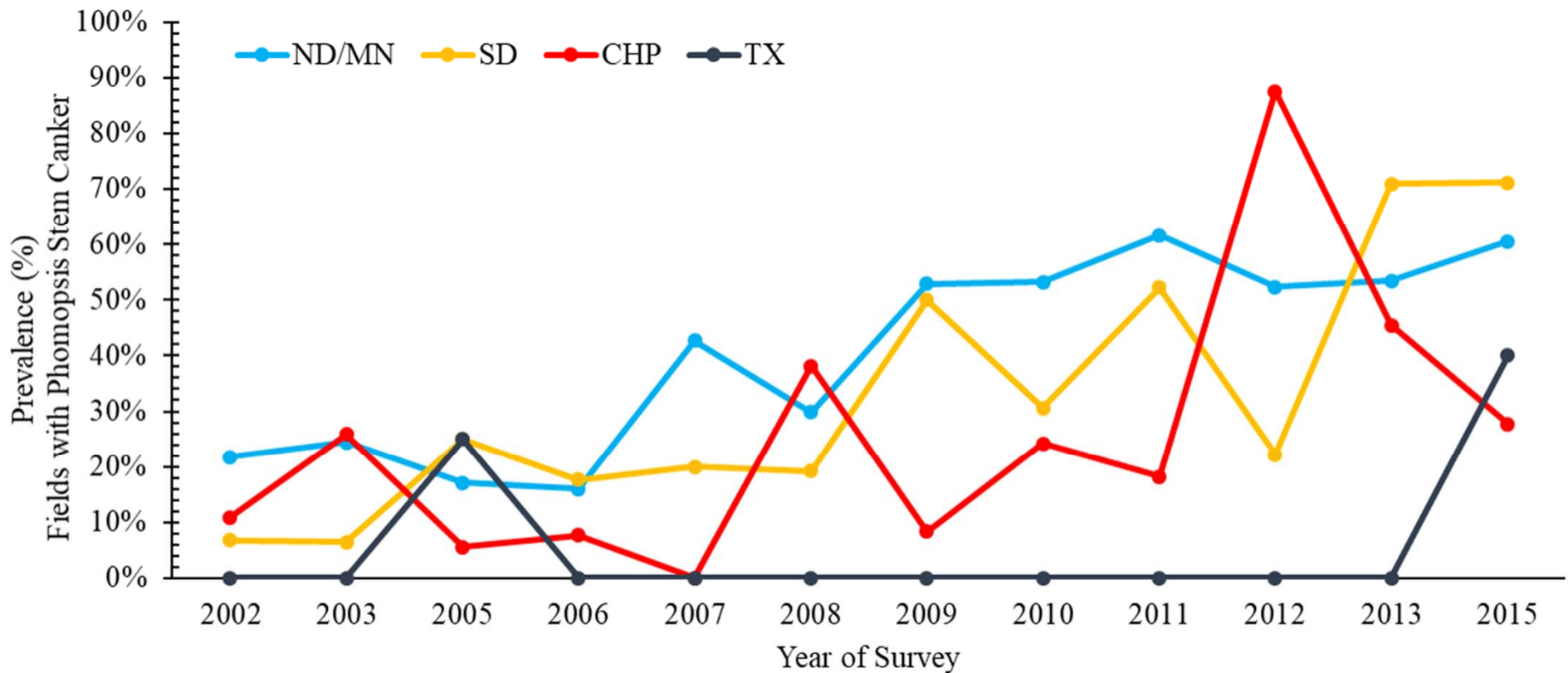
# Incidence of Rhizopus head rot



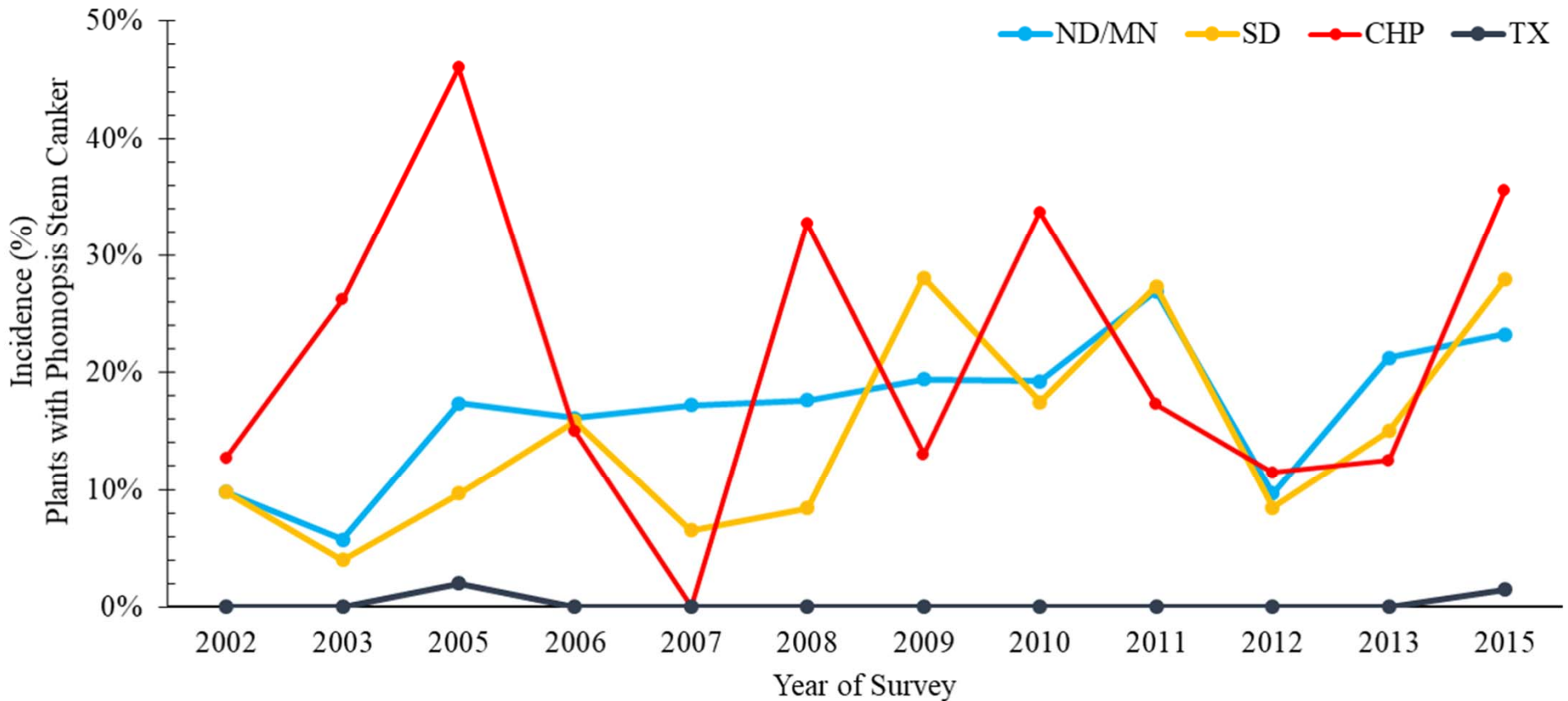
# Phomopsis stem canker



# Prevalence of Phomopsis stem canker



# Incidence of Phomopsis stem canker



# Summary of Trends

- Downy
  - Consistently most common in ND & MN
- Rust
  - Most common of top five, national
- Sclerotinia Head Rot
  - ND, MN, SD
- Rhizopus
  - TX and CHP, with CHP having more damage
- Phomopsis
  - Increasing everywhere (TX?)



# Impact

- Survey is unique among crops
- Data is powerful
  - Sunflower priorities
  - Leveraging funding
- Potential is very high

# Acknowledgements

- Surveyors!
- Companies, Universities, NSA
- Coordinators
- Michaela Halvorson (mapping)

