

USA
Sunflower Survey



*Partnership of
University, USDA & Industry*

*2015
NATIONAL
SUNFLOWER
ASSOCIATION
SURVEY*

Project Leaders:

Hans Kandel, Extension Agronomist

NDSU Plant Science Department

Tom Gulya, Retired Plant Pathologist ARS

SURVEY FORMAT

1. **Yield components** (*Plant population, head diameter, seed seed, % good seed, % center set, bird damage*) = six components
2. **Agronomic info** (eight components)
3. **Weed assessment** (30 weeds)
4. **Diseases** - incidence and severity on 10 diseases
5. **Insect and bird damage** = In-field assessment and lab exam of seed samples – 10 components
6. **Two sites examined per field**

THUS.... $(6 + 8 + 30 + 10 + 10) \times 2 = 128$ observations /field x 201

fields = **26,000 data points in one survey**

13 surveys = > 300,000 pieces of data

2015 SUNFLOWER SURVEY - # FIELDS

- North Dakota - 106
- Minnesota - 13
- South Dakota - 52
- Kansas - 5
- Colorado - 7
- Nebraska - 6
- Manitoba - 7
- Texas - 5

TOTAL - 201



2015 SUNFLOWER SURVEY TEAMS

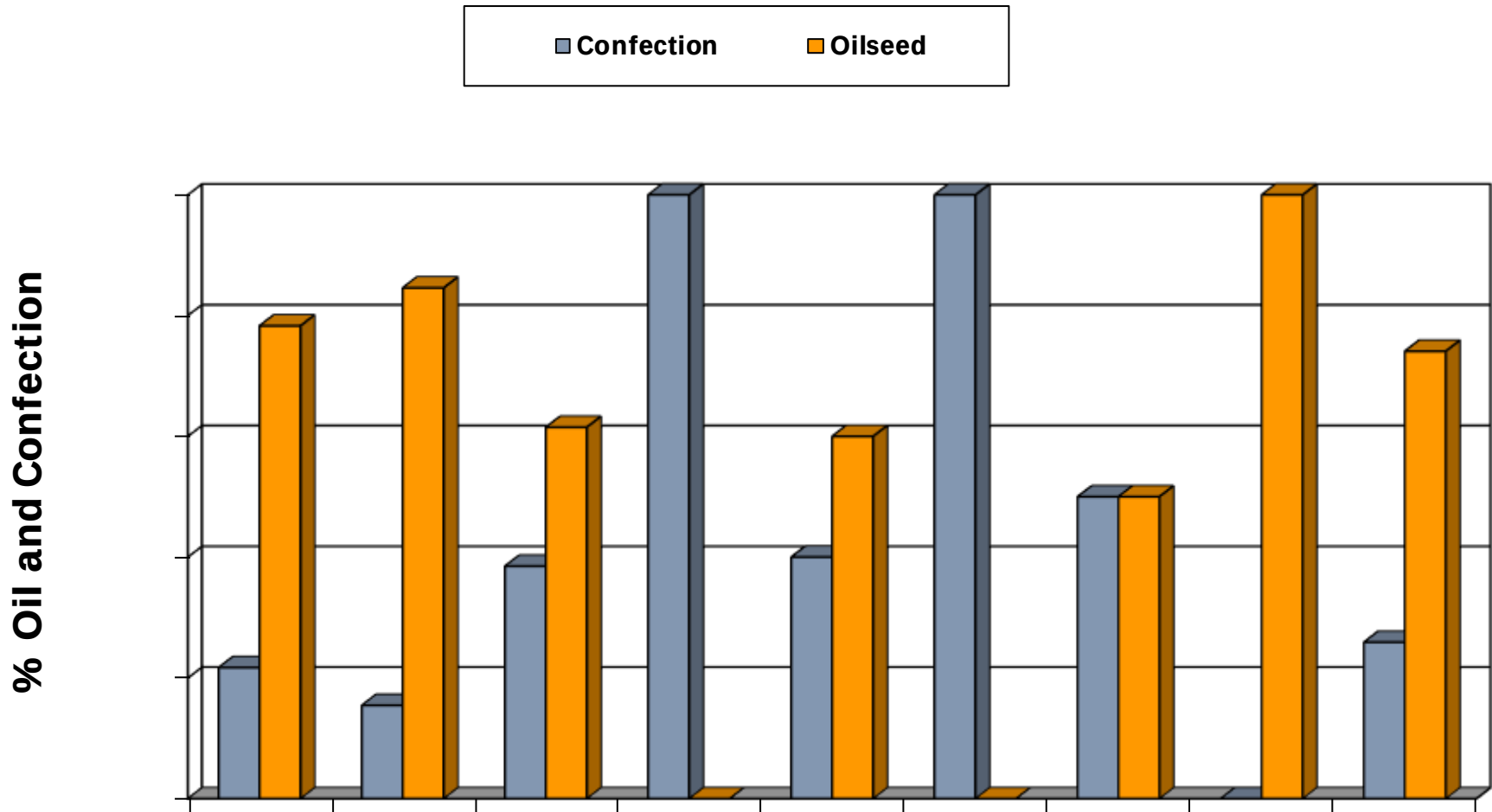
- North Dakota 14 teams
- South Dakota 6 teams
- Minnesota 1 team
- Colorado 1 team
- Kansas 1 team
- Nebraska 1 team
- Texas 1 team
- Manitoba 1 team
- Texas 1 team

Total

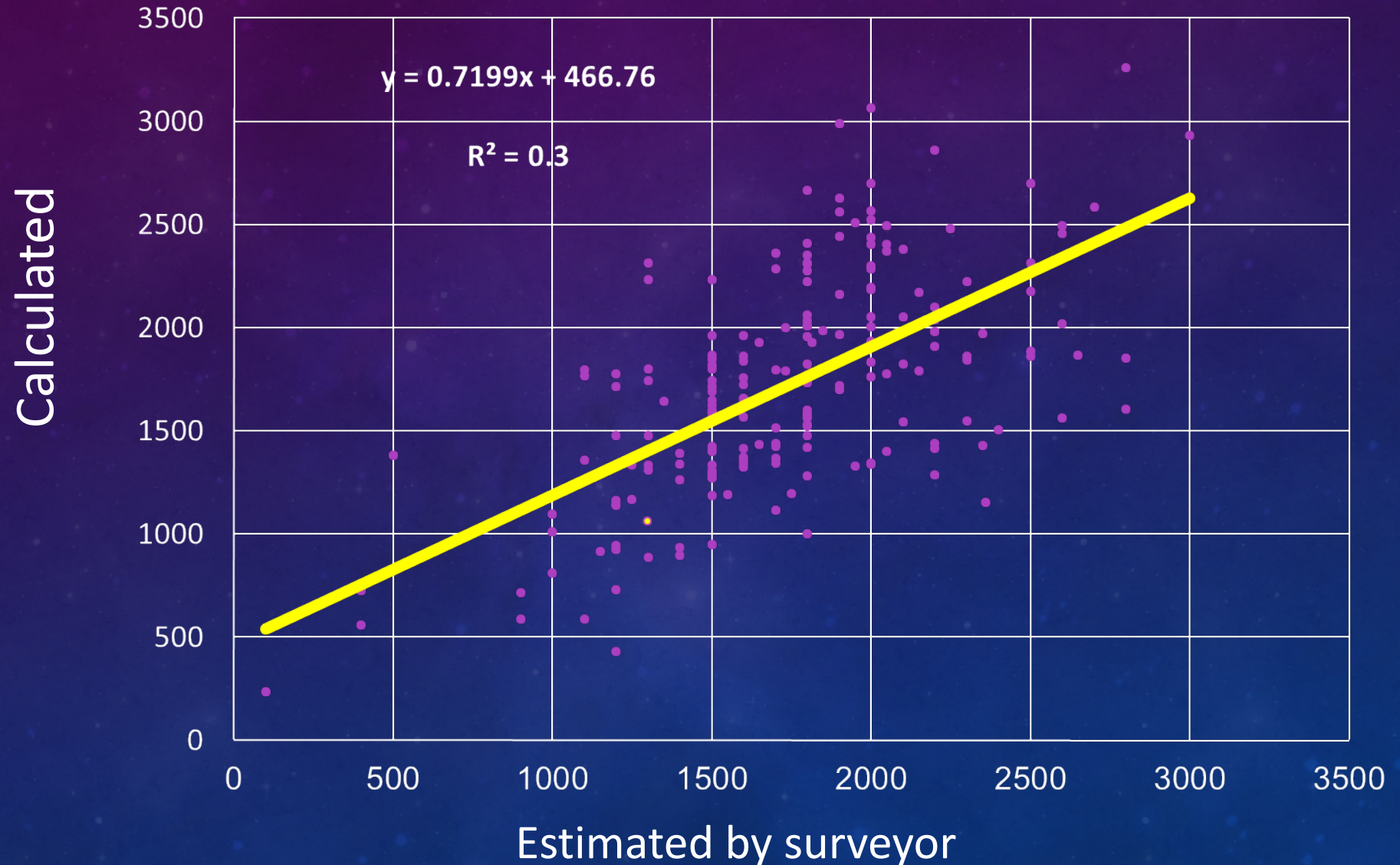
27 teams



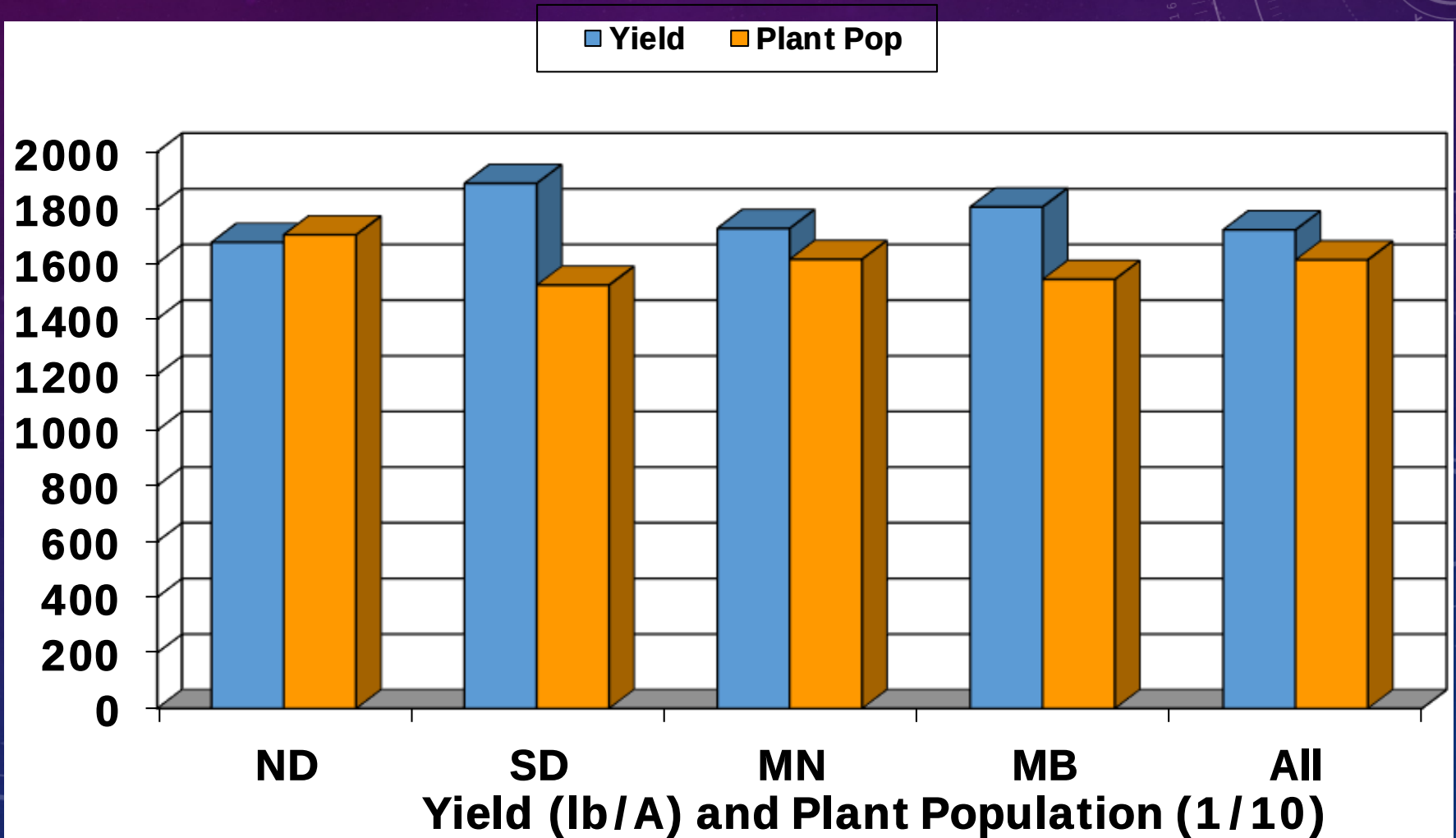
CONFECTION VS OILSEED (%) SUNFLOWER 2015 SURVEY



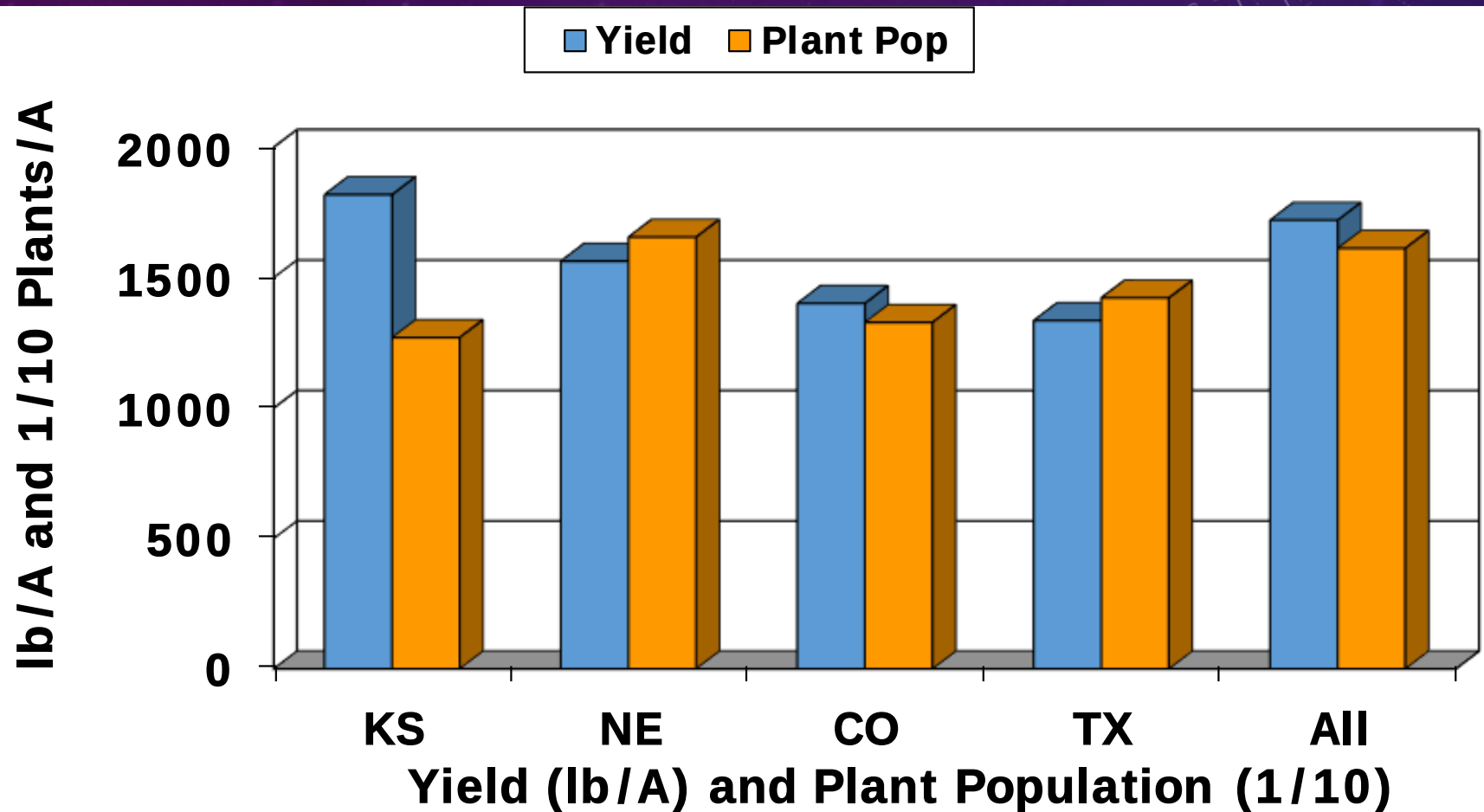
2015 SURVEYOR ESTIMATED & CALCULATED YIELD



SUNFLOWER YIELD & PLANT POPULATION: 2015

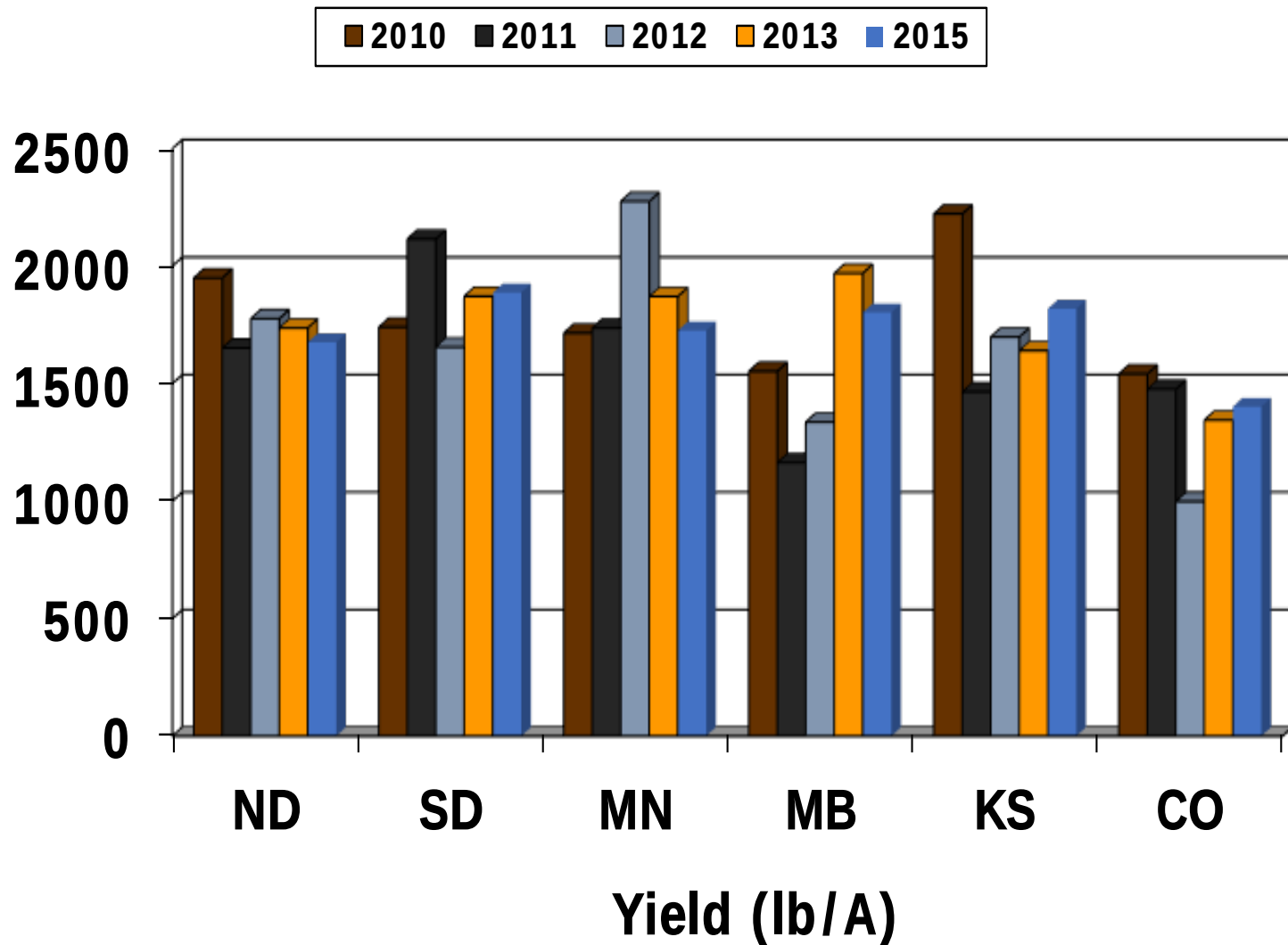


SUNFLOWER YIELD & PLANT POPULATION: 2015



SUNFLOWER YIELD (LB/A)

2010-2015



2013 #1 YIELD LIMITING FACTORS

(209 FIELDS)

- **Disease** 17%
- **Plant spacing in row** 26%
- **Lodging** 10%
- Weeds 4%
- Birds 6%
- Insects 1%
- **Drought** 15%
- Hail 1%
- Uneven plant growth 2%
- Other 7%
- **No Problem** 11%



2015 #1 YIELD LIMITING FACTORS (201 FIELDS)

- **Disease** 24 %
- **Plant spacing in row** 13 %
- Lodging 8 %
- Weeds 8 %
- Birds 7 %
- Insects 4 %
- **Drought** 11 %
- Uneven plant growth 4 %
- Other 9 %
- **No Problem** 11 %



PLANT SPACING WITHIN ROW



2015 #2 YIELD LIMITING FACTORS – (ALL 201 FIELDS)

- **Disease** 13 %
- Plant spacing in row 9 %
- Lodging 9 %
- Weeds 9 %
- Birds 5 %
- Insects 5 %
- Drought 4 %
- Hail 2 %
- Uneven plant growth 1 %
- Other 6 %
- **No Problem** 37 %



2015 #1 YIELD LIMITING FACTORS - NORTH DAKOTA (106 FIELDS)

• Disease	24 %
• Plant spacing	10 %
• Lodging	12 %
• Weeds	2 %
• Birds	8 %
• Insects	3 %
• Drought	10 %
• Hail	0%
• Uneven plant growth	2 %
• Other	15 %
• No Problem	13 %



2015 #2 YIELD LIMITING FACTORS - NORTH DAKOTA (106 FIELDS)

- **Disease** 10 %
- Plant spacing 6 %
- **Lodging** 11 %
- Drought 3 %
- Weeds 6 %
- Insects 4 %
- Birds 4 %
- Uneven plant growth 2 %
- Other 8 %
- **No Problem** 47 %



2015 # 1 AND #2

YIELD LIMITING FACTORS SOUTH DAKOTA

(52 FIELDS)



#1 Factor

- **Disease** 21 %
- **Plant Spacing** 23 %
- Lodging 4 %
- **Weeds** 15 %
- Birds 6 %
- Insects 8 %
- Drought 8 %
- Hail 0%
- Uneven growth 10 %
- No problem 6 %

#2 Factor

- **Disease** 15 %
- **Plant spacing** 13 %
- Lodging 8 %
- Weeds 4 %
- Birds 0%
- Insects 10 %
- Drought 8 %
- Hail 4 %
- Uneven growth 2 %
- **No Problem** 25 %

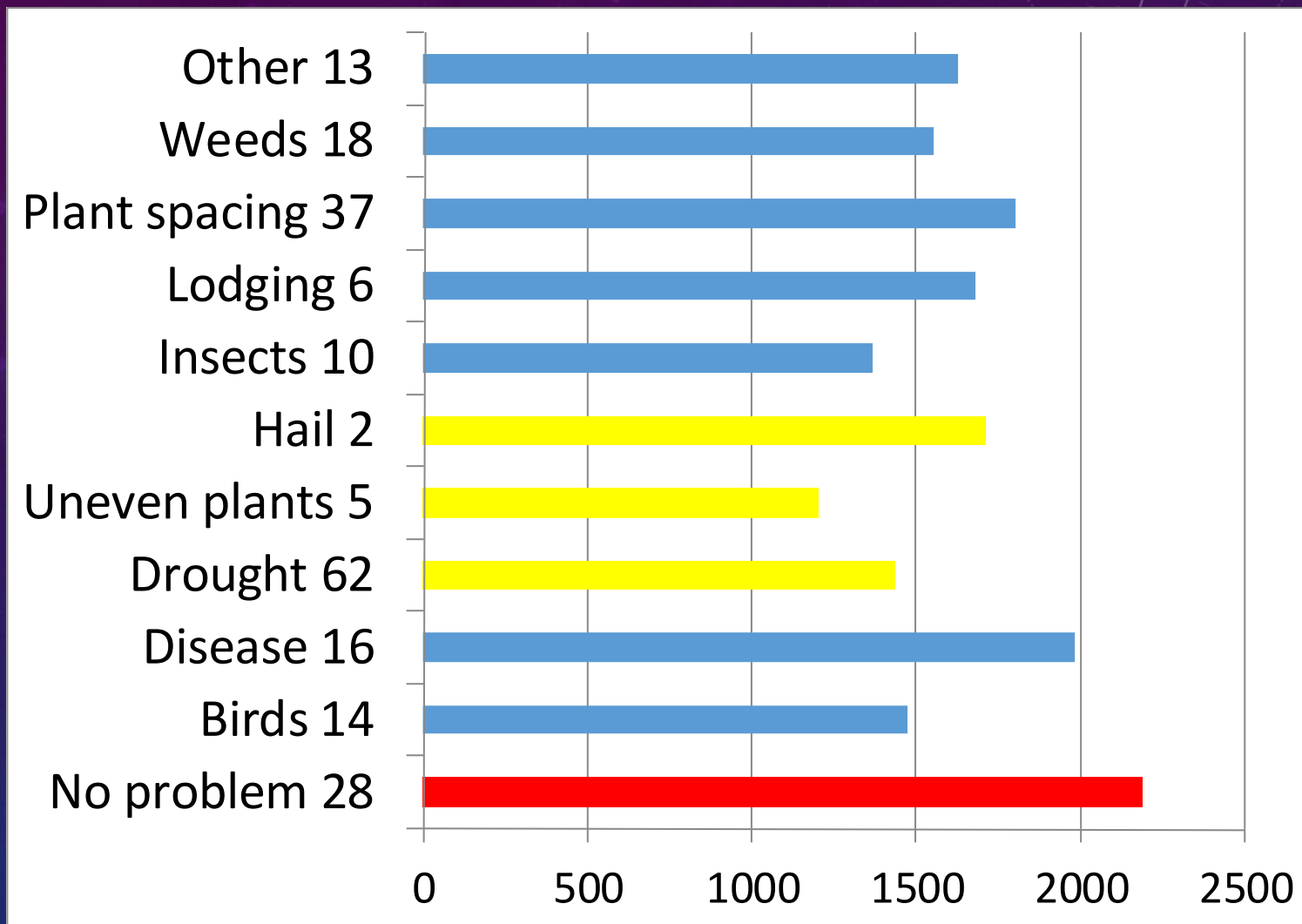
Most # 1 Limiting Factors 2010 - 2015

Sunflower Surveys

	2010	2011	2012	2013	2015	5 yr AV.
Plant Spacing	18	18	18	26	13	19
Diseases	21	18	7	17	24	17
Drought	5	8	29	15	11	14
No Problem	12	14	13	11	11	12
Weeds	10	8	8	4	8	8

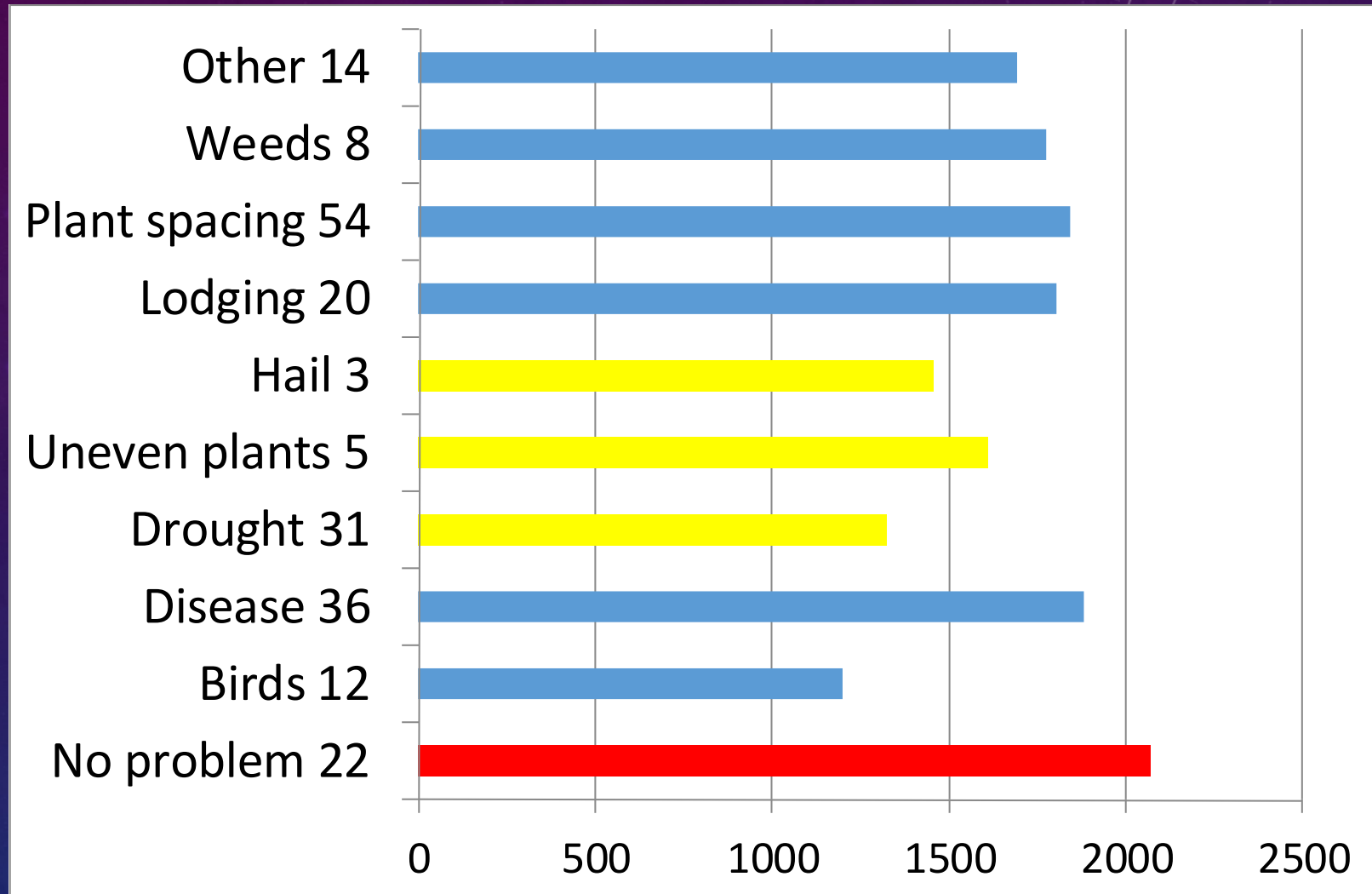
¹Based on 207 fields in 2010, 155 (2011), 211 (2012), 209 (2013), and 201 (2015)
= 983 total over five years.

YIELD LIMITING FACTOR AND YIELD 2012



“No Problem” yield = 2188 # / A. Average of all other problems = 1524 # / A or -30%.

YIELD LIMITING FACTOR AND YIELD 2013



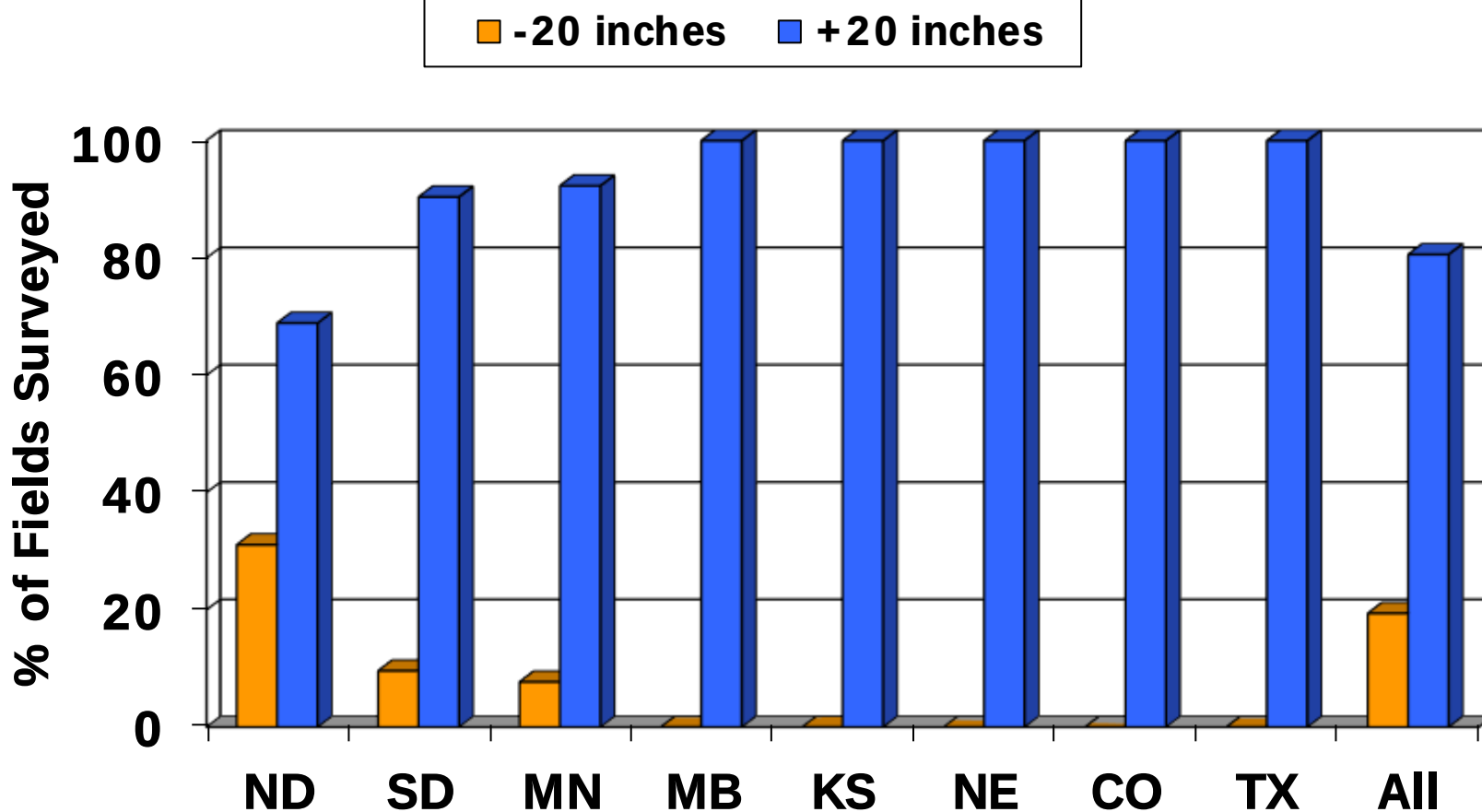
“No Problem” yield = 2070 # / A. Average all other problems = 1607 # / A or -22% yield.

YIELD LIMITING FACTOR AND YIELD 2015

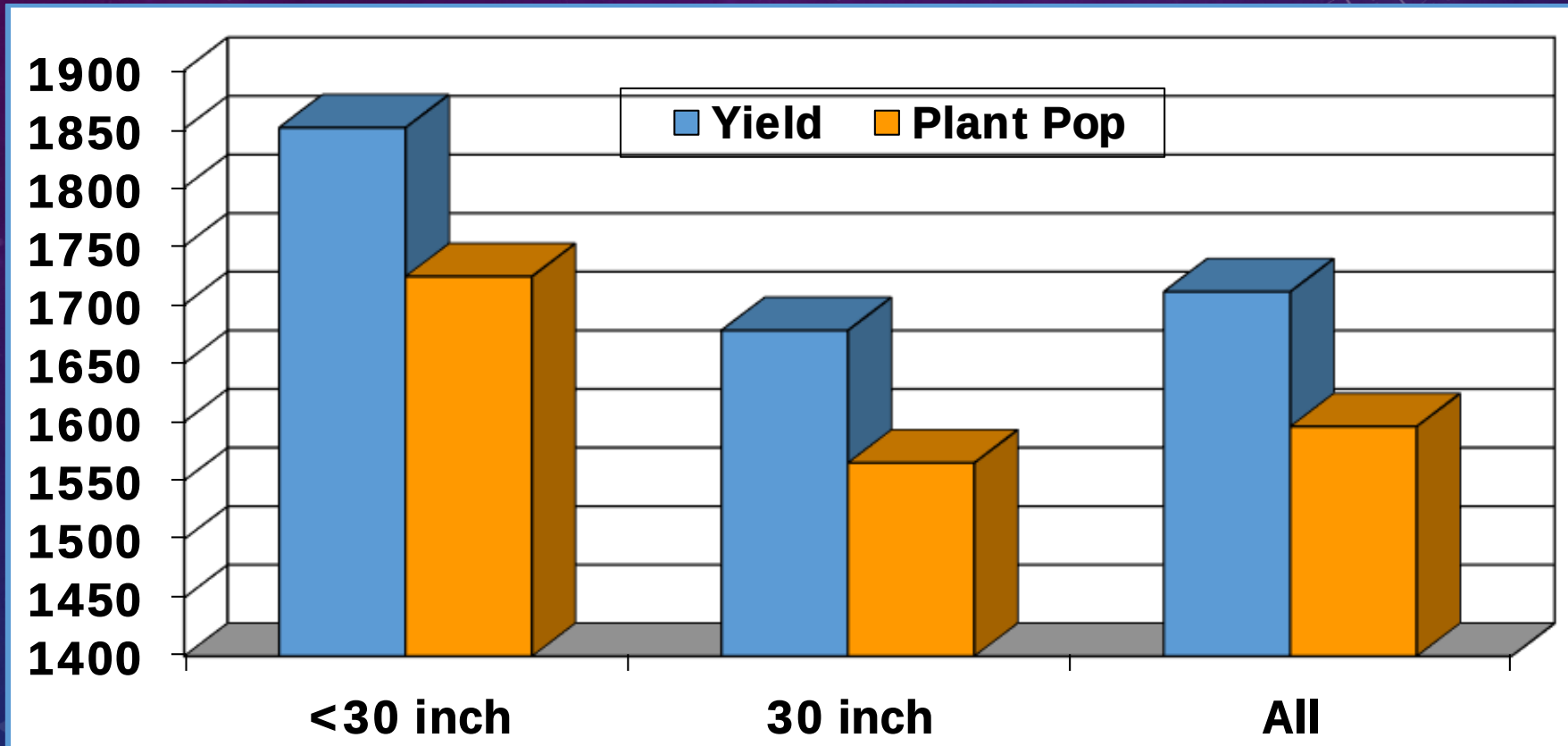


“No Problem” Yield = 2193 # / A. Average all other problems = 1634 # / A or -25%.

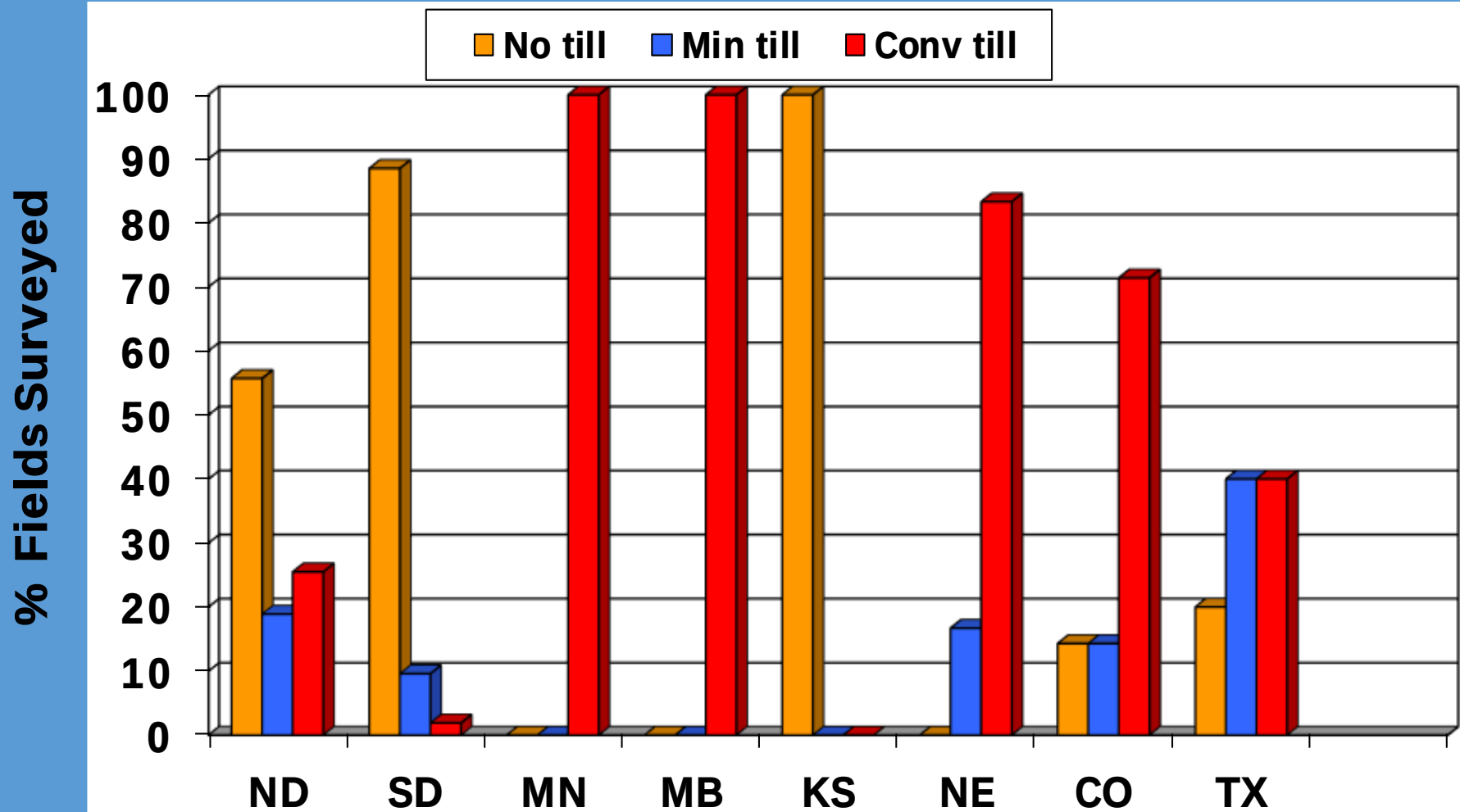
ROW SPACING IN SUNFLOWER - 2015



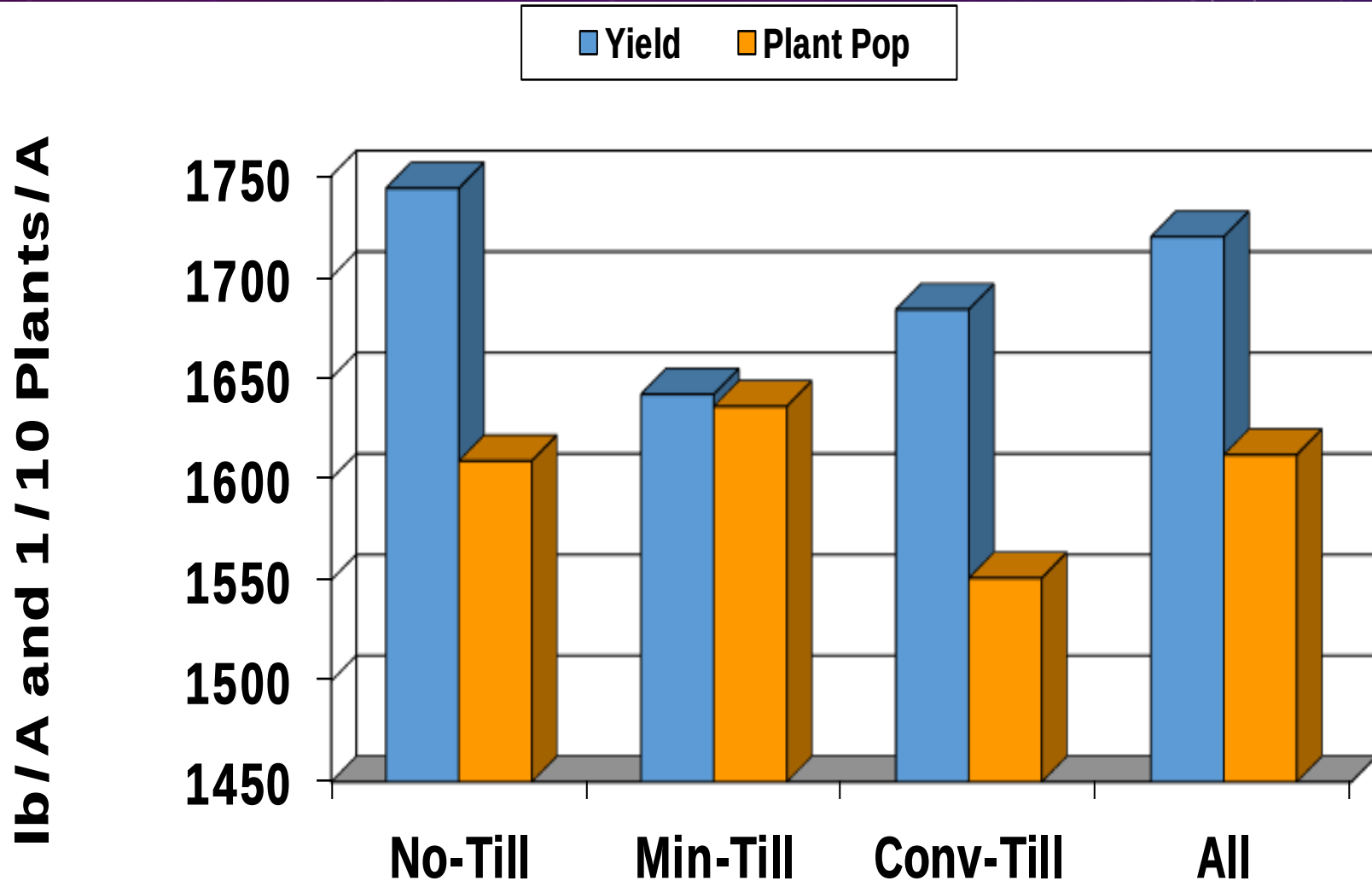
2015 SUNFLOWER YIELD & PLANT POPULATION WITH ROW SPACING



TILLAGE IN SUNFLOWER - 2015



2015 SUNFLOWER YIELD AND PLANT POPULATION VS TILLAGE



The background is a dark blue gradient with faint, light blue circular patterns and a scale. The scale is a semi-circular arc on the left side, with numbers ranging from 160 to 260 in increments of 10. There are also some dashed circular lines and arrows scattered across the background.

DISEASE EVALUATIONS

2015

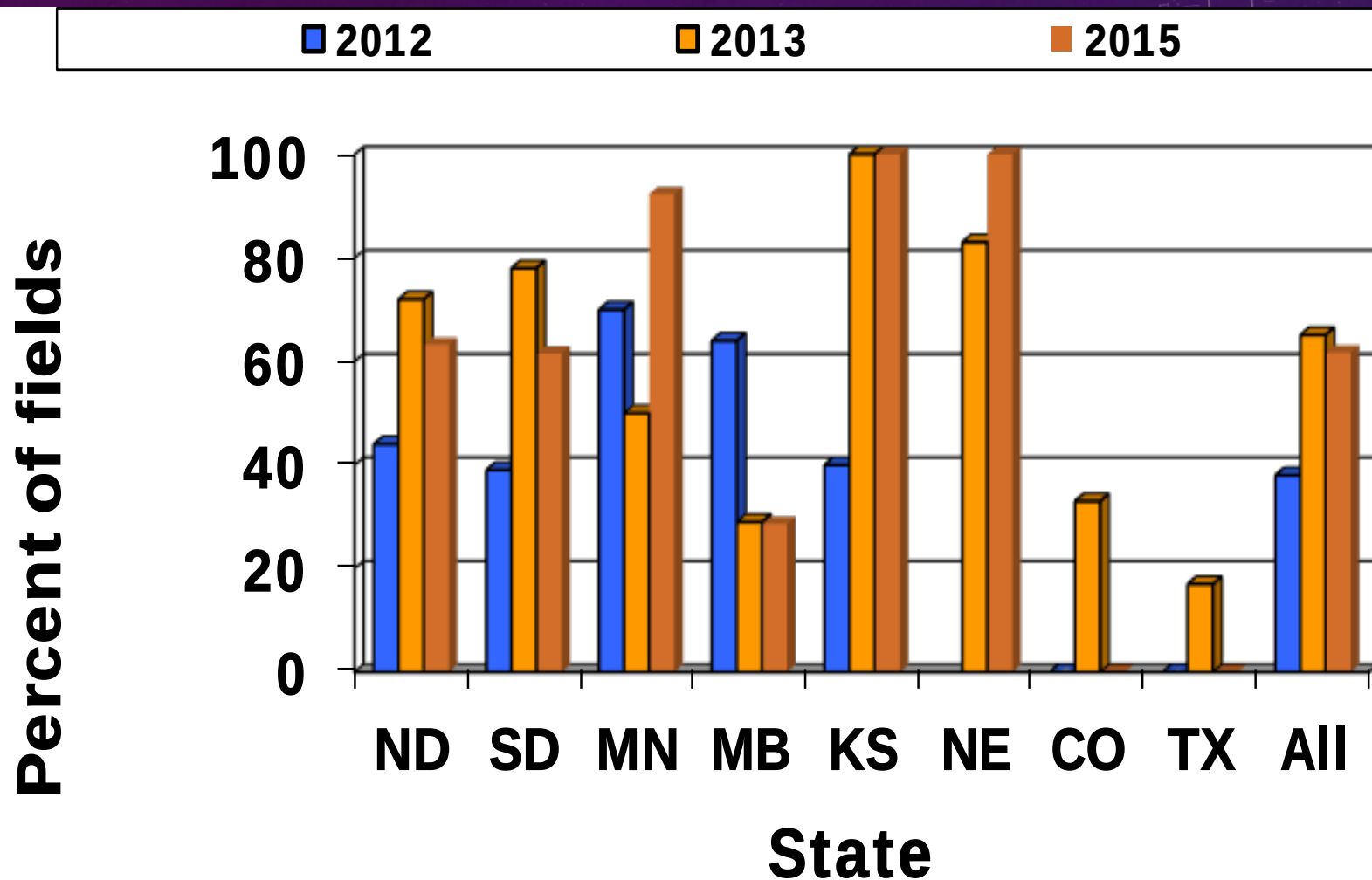
**RUST, SCLEROTINIA,
PHOMOPSIS, RHIZOPUS,
VERT, DOWNY MILDEW**

RUST IN SUNFLOWER

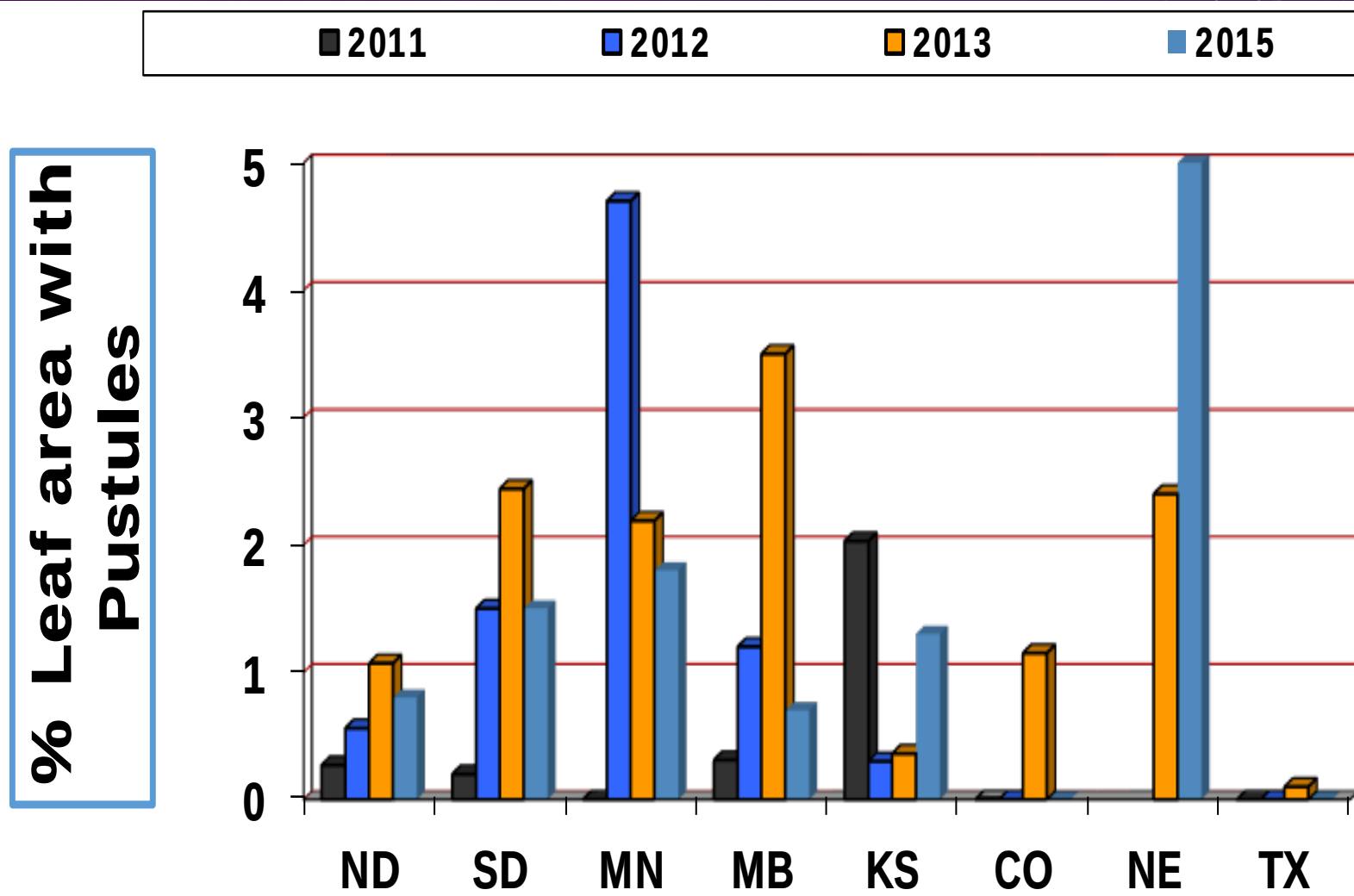


Instructions were examine upper 4 leaves on 5 consecutive plants and determine % of the leaf area covered with rust.

RED RUST INCIDENCE IN SUNFLOWER

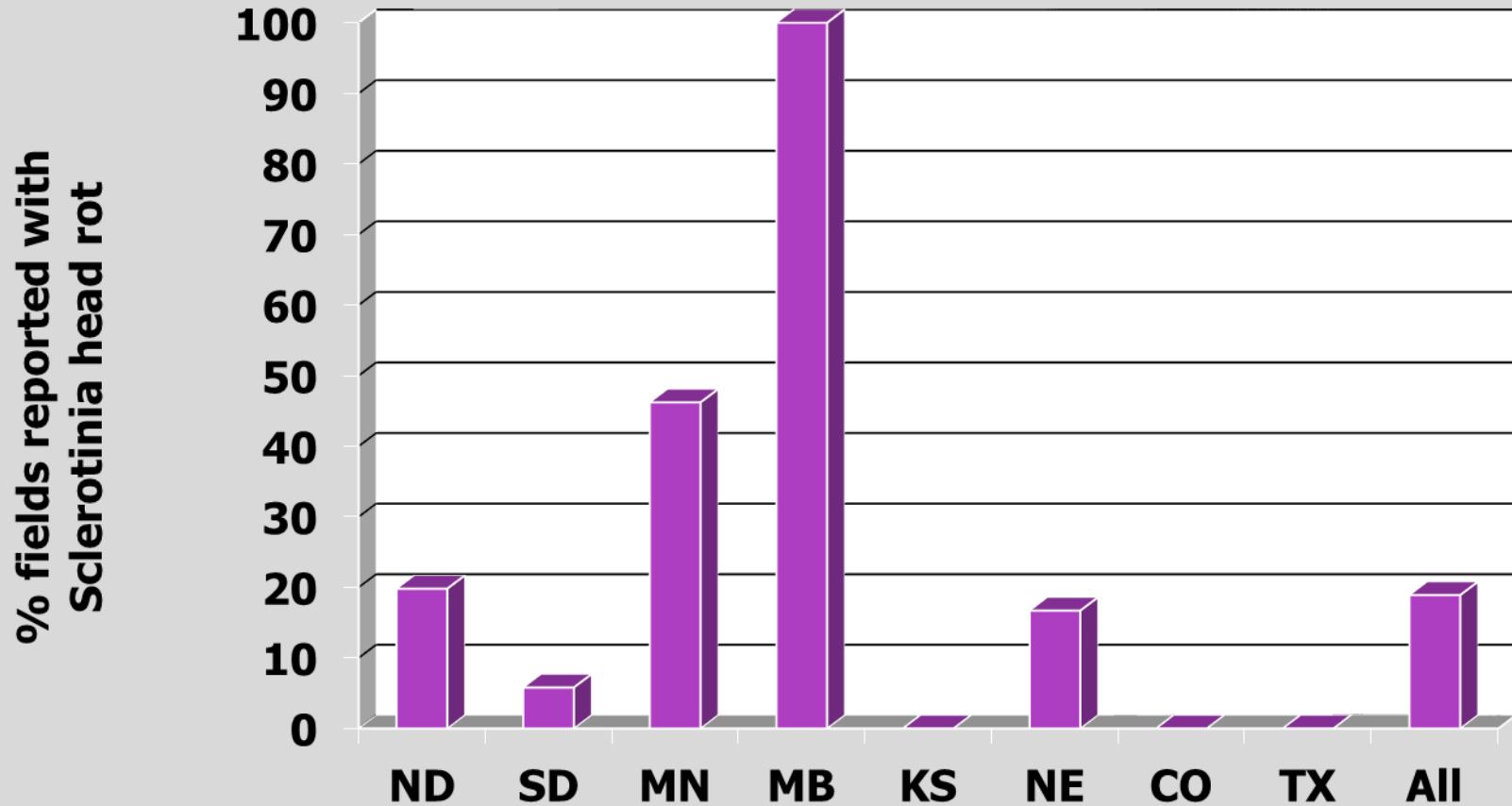


RED RUST SEVERITY IN SUNFLOWER

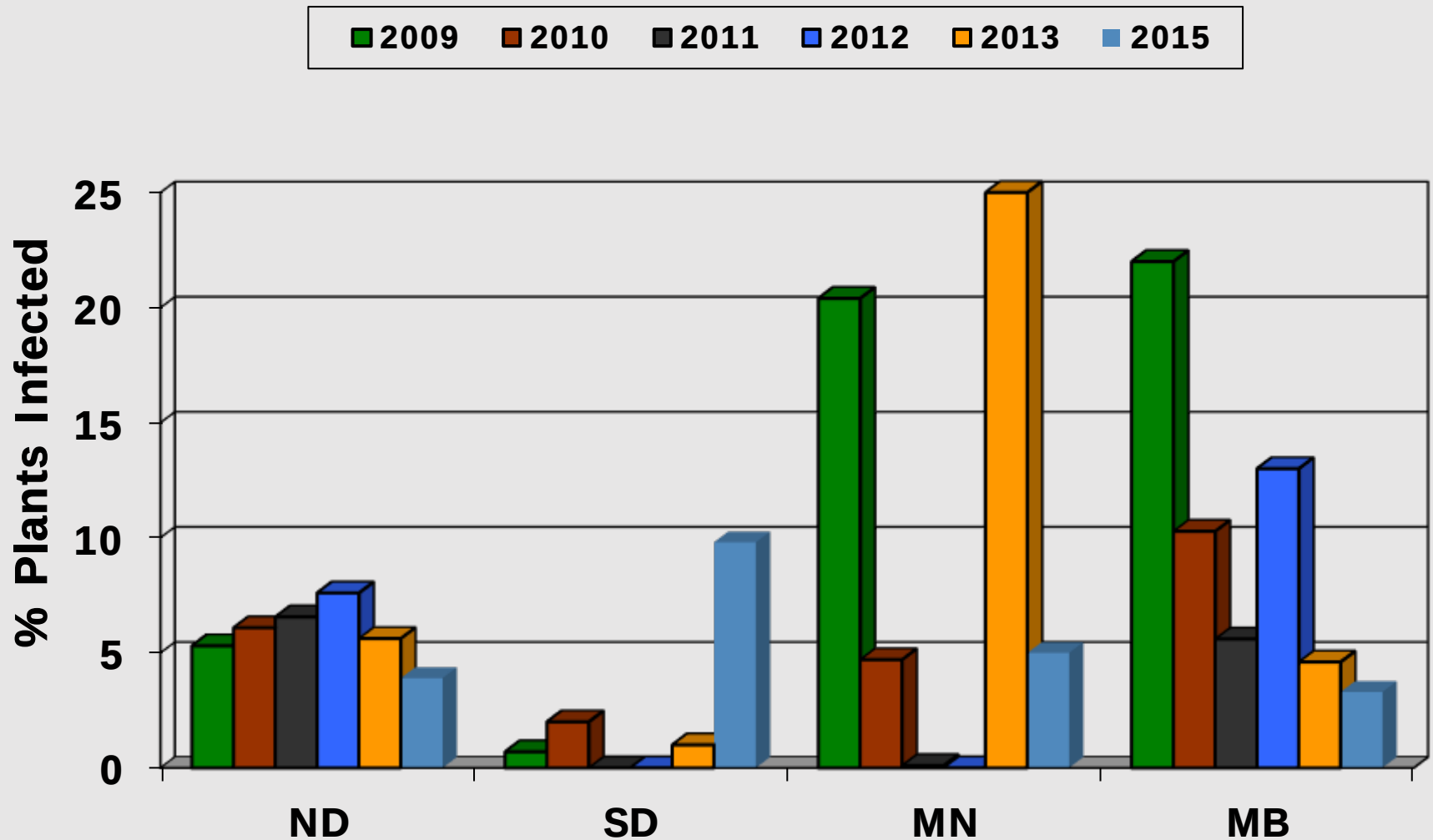


Rust Severity Estimated for Fields Where Incidence Reported

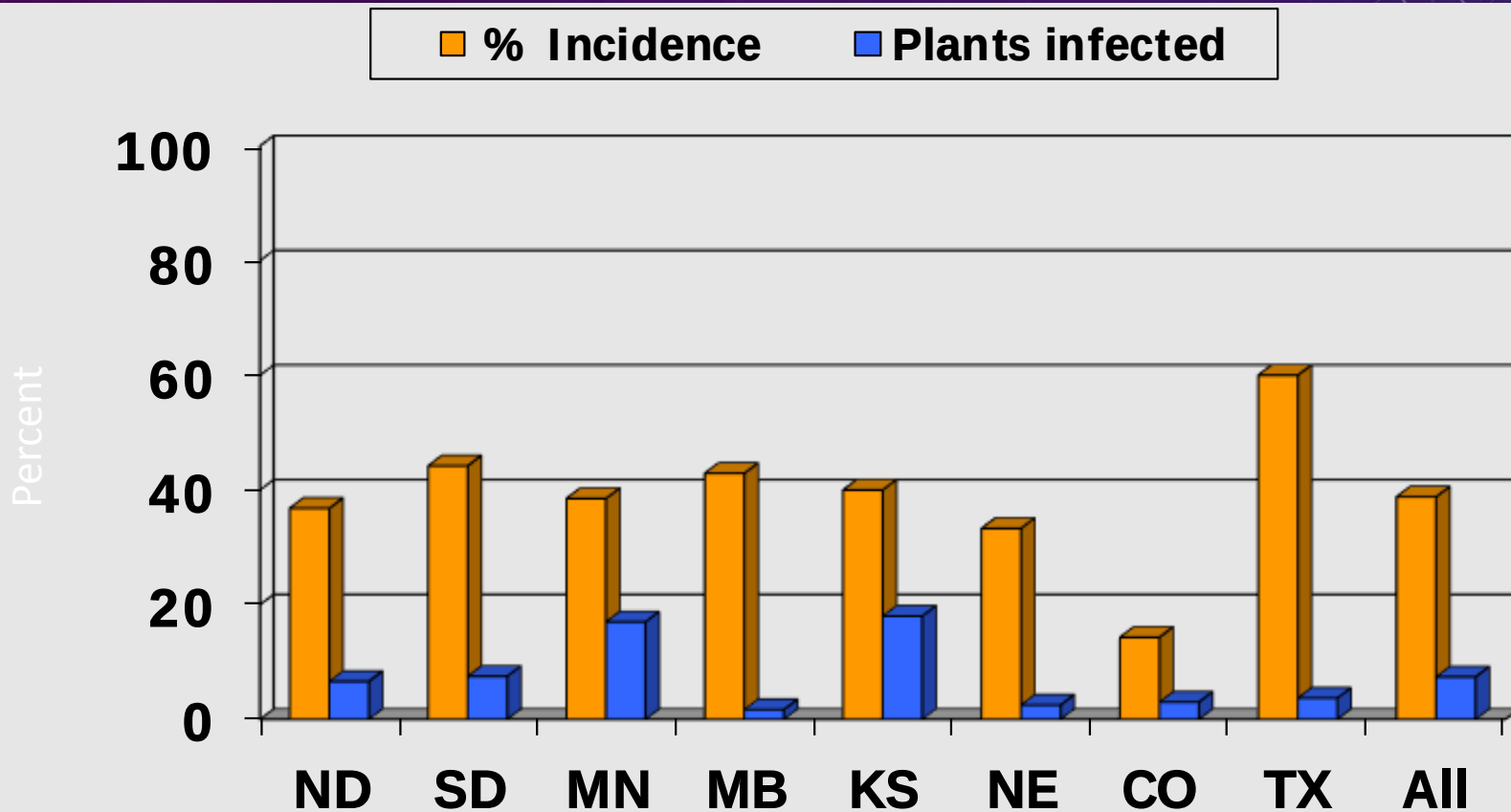
SCLEROTINIA HEAD ROT INCIDENCE IN SUNFLOWER 2015



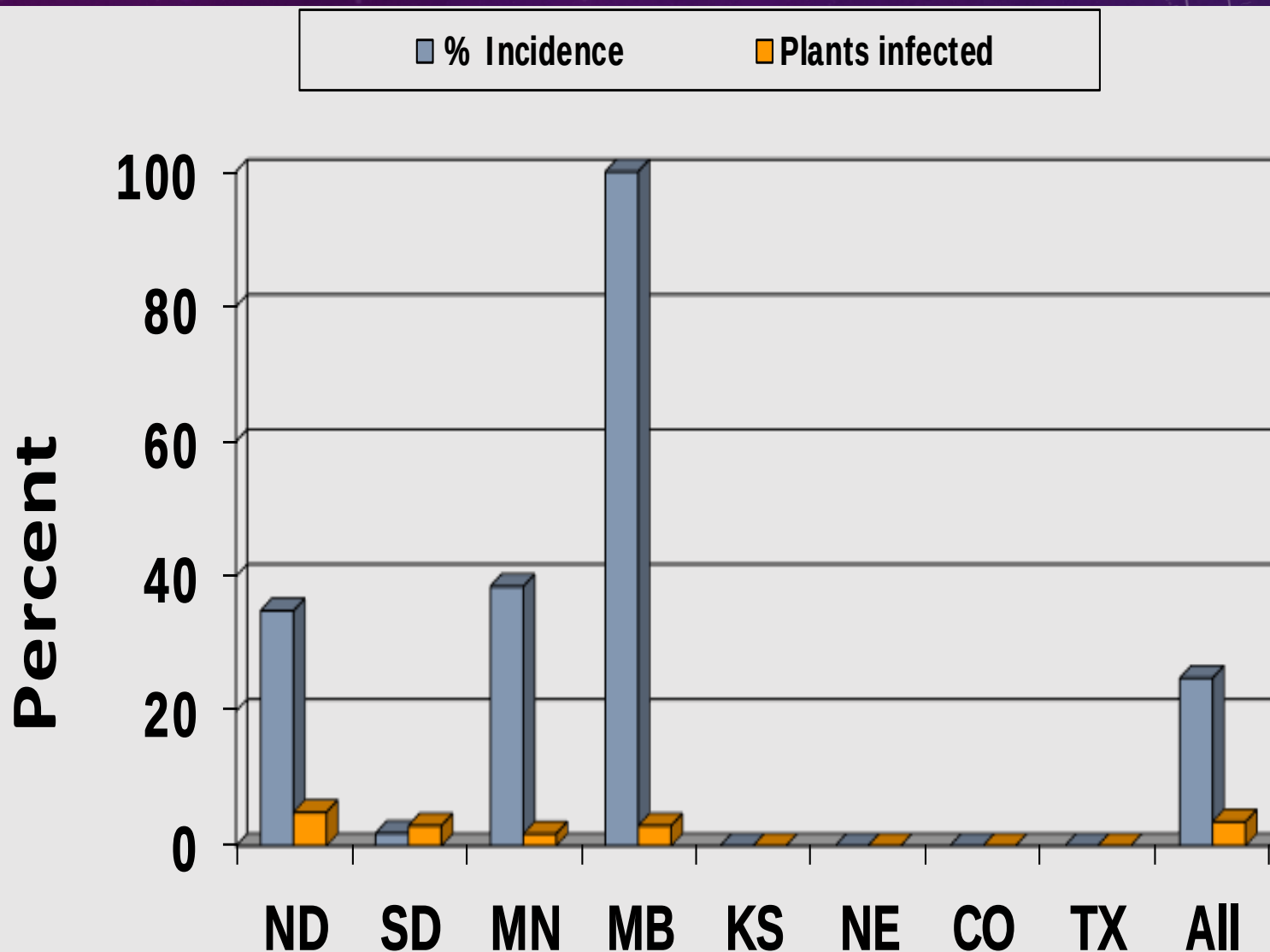
SCLEROTINIA HEAD ROT SEVERITY 2009-2015



RHIZOPUS HEAD ROT INCIDENCE & SEVERITY 2015



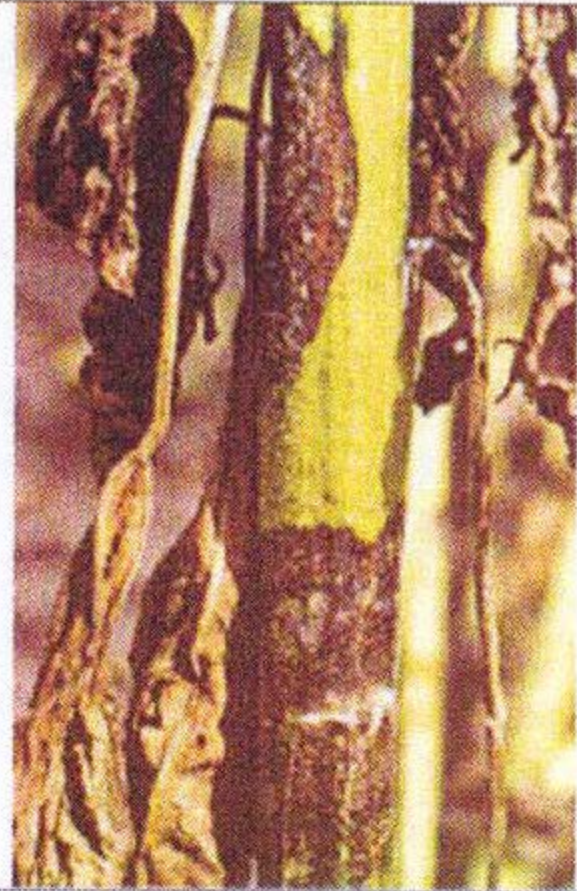
SCLEROTINIA STALK ROT INCIDENCE & SEVERITY - 2015



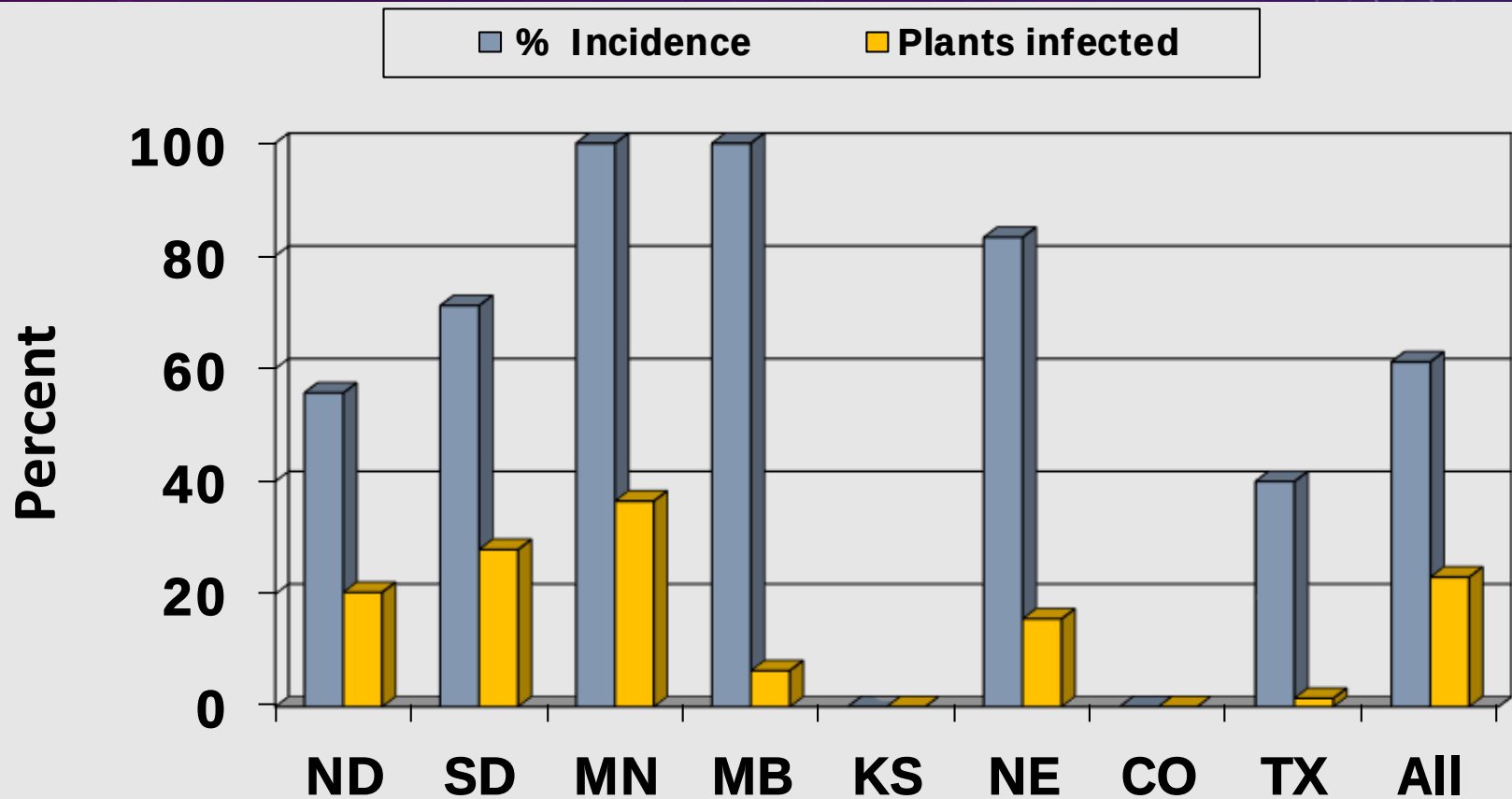
Phomopsis Stem Canker



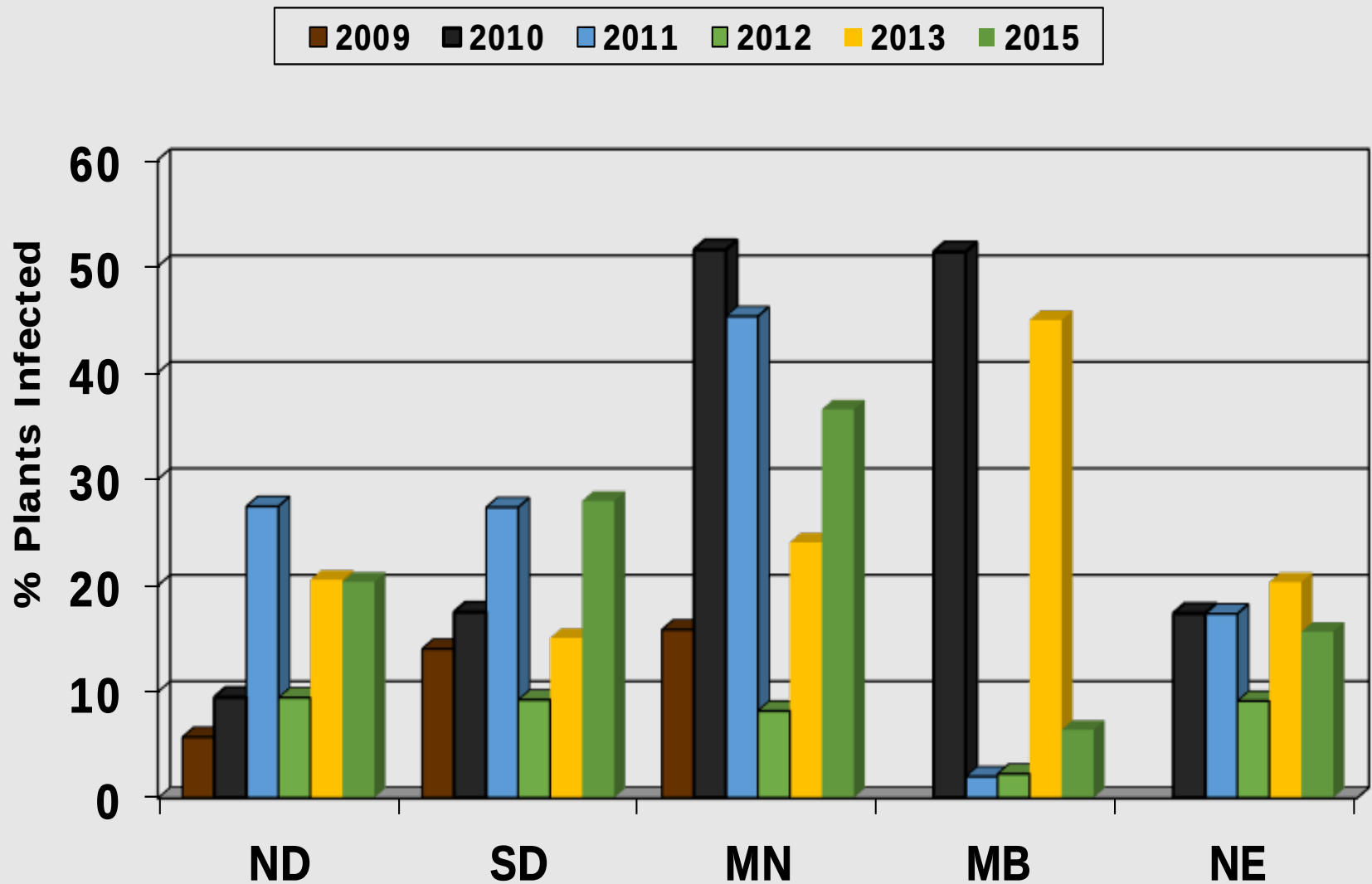
Phoma



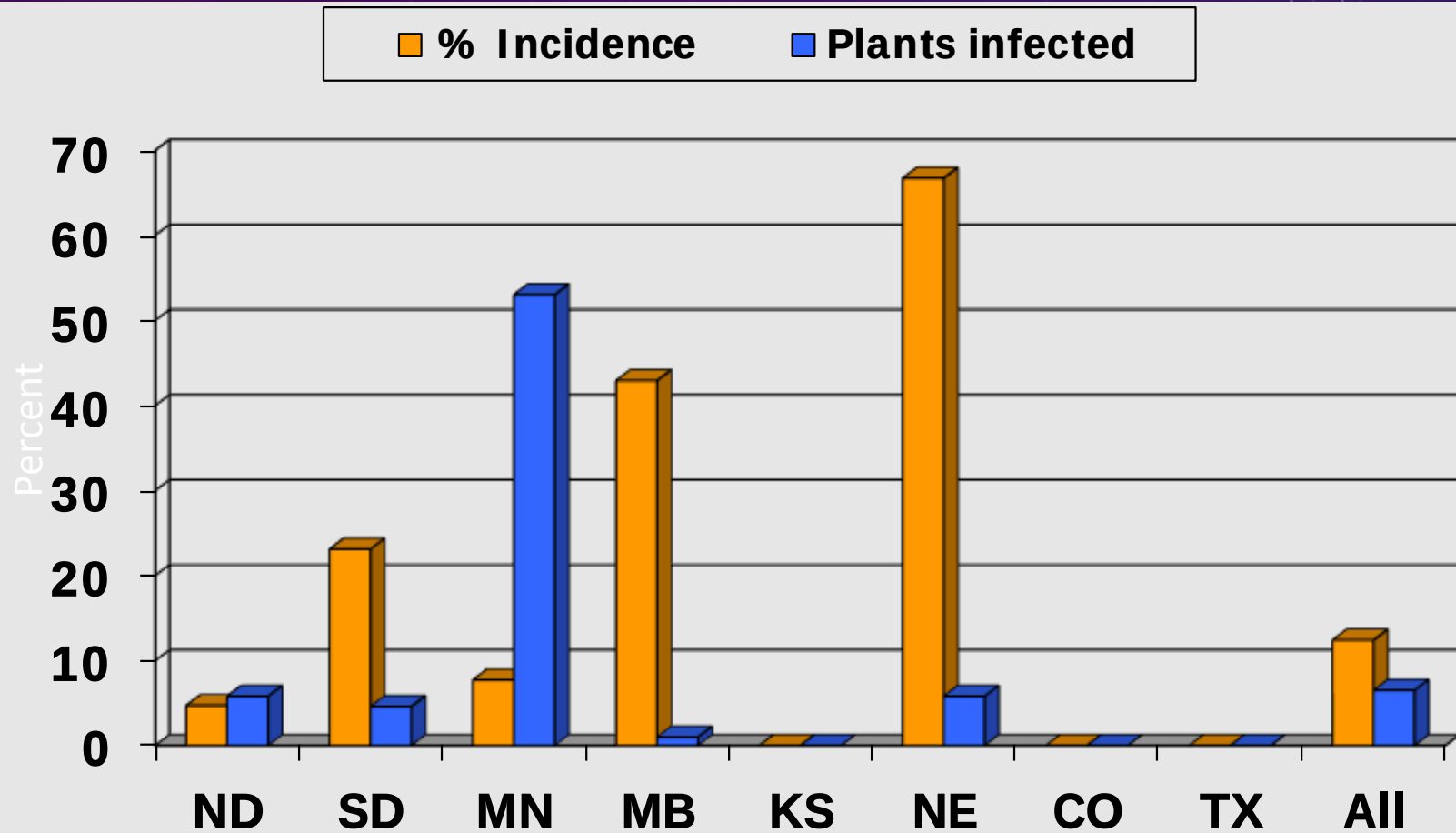
PHOMOPSIS INCIDENCE AND SEVERITY 2015



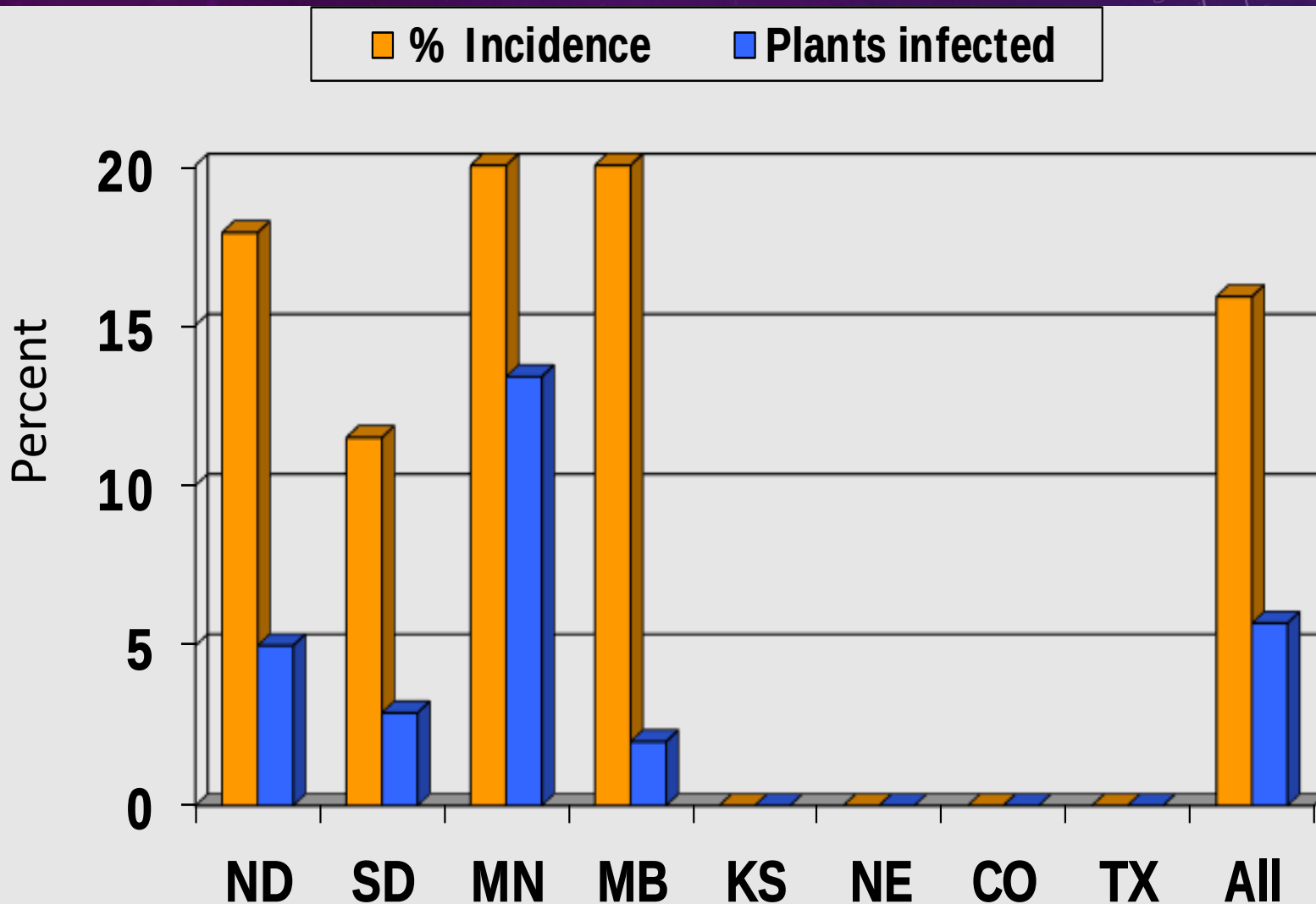
PHOMOPSIS SEVERITY 2009-2015

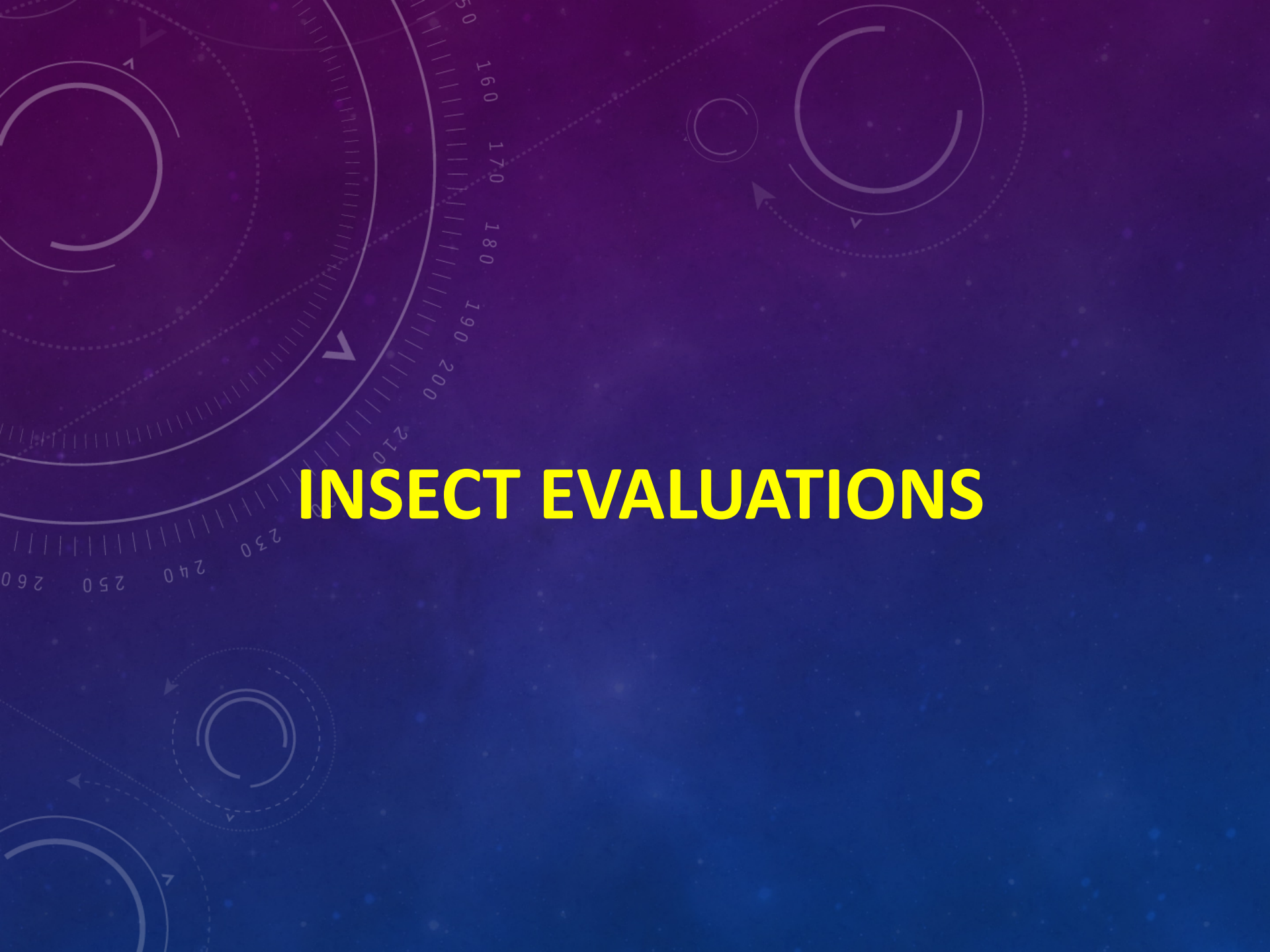


VERTICILLIUM INCIDENCE & SEVERITY 2015



DOWNY MILDEW INCIDENCE & SEVERITY 2015

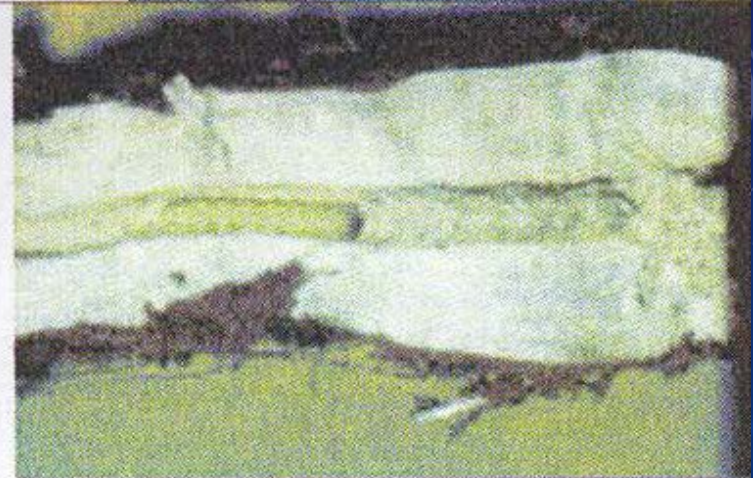
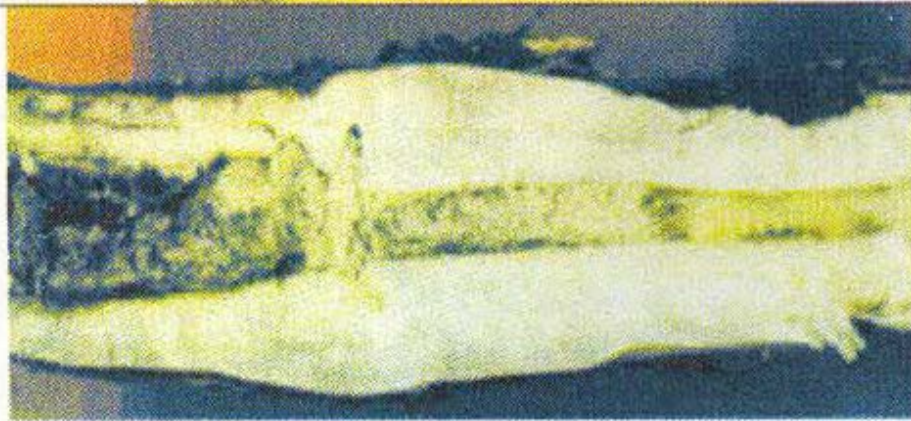


The background is a gradient of dark blue to purple, speckled with small white dots. Overlaid on this are several faint, white circular and semi-circular patterns. Some of these patterns include arrows indicating a clockwise direction. A prominent feature is a large circular scale on the left side, with numerical markings ranging from 150 to 260 in increments of 10. The text 'INSECT EVALUATIONS' is centered in a bold, yellow, sans-serif font.

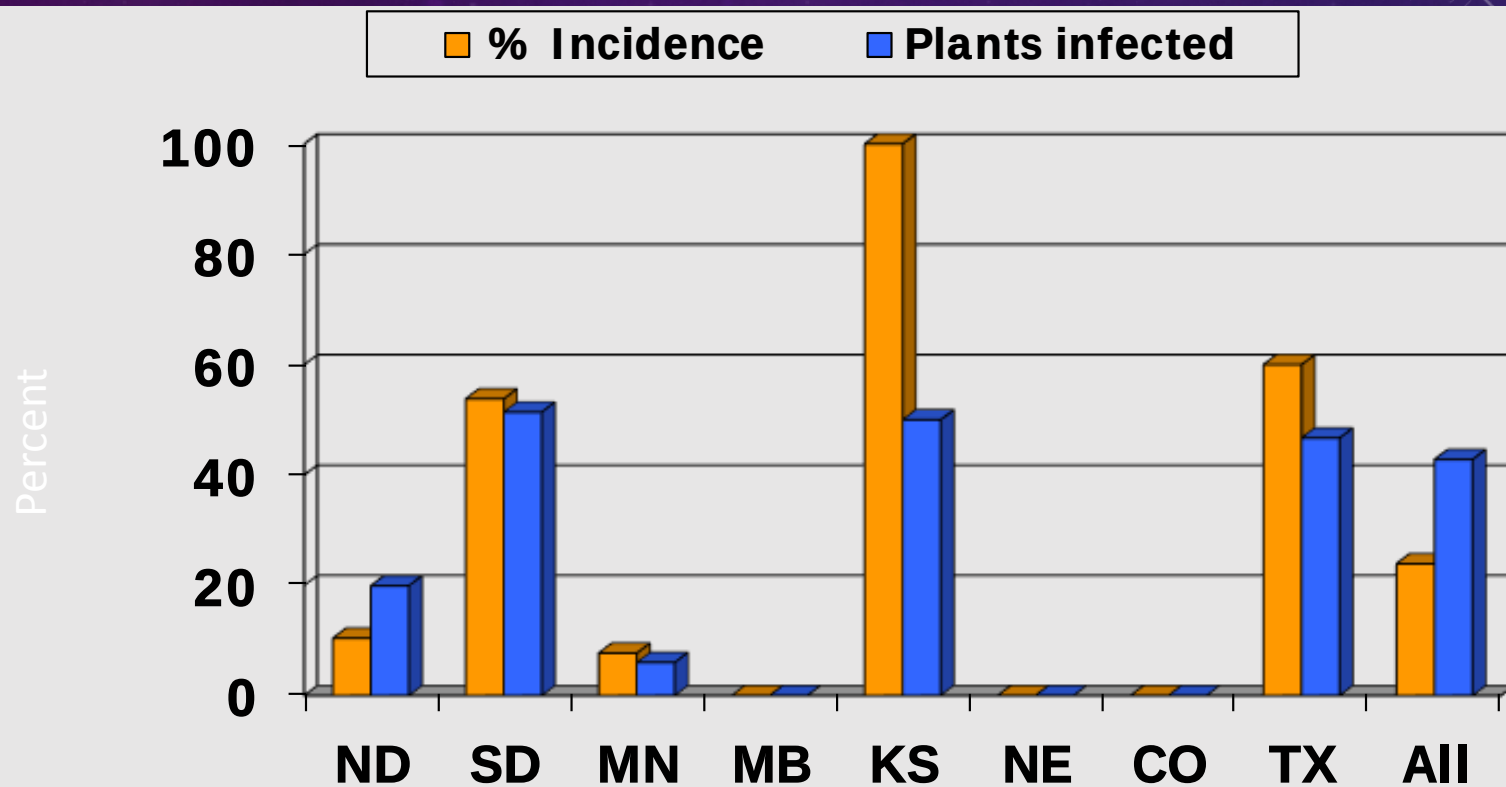
INSECT EVALUATIONS

LONG-HORNED BEETLE (*DECTES*)

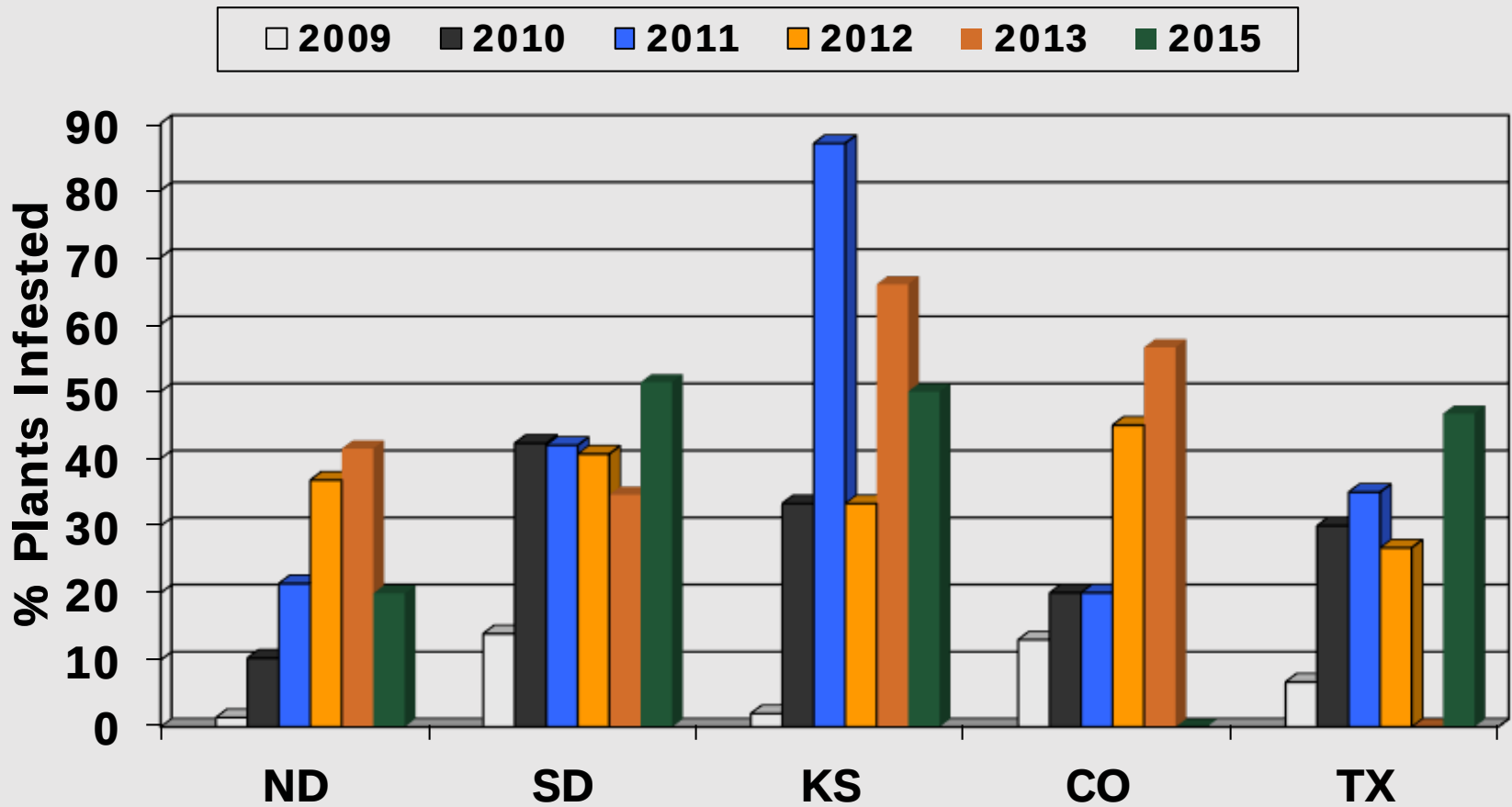
Dectes (Long-horned Beetle)



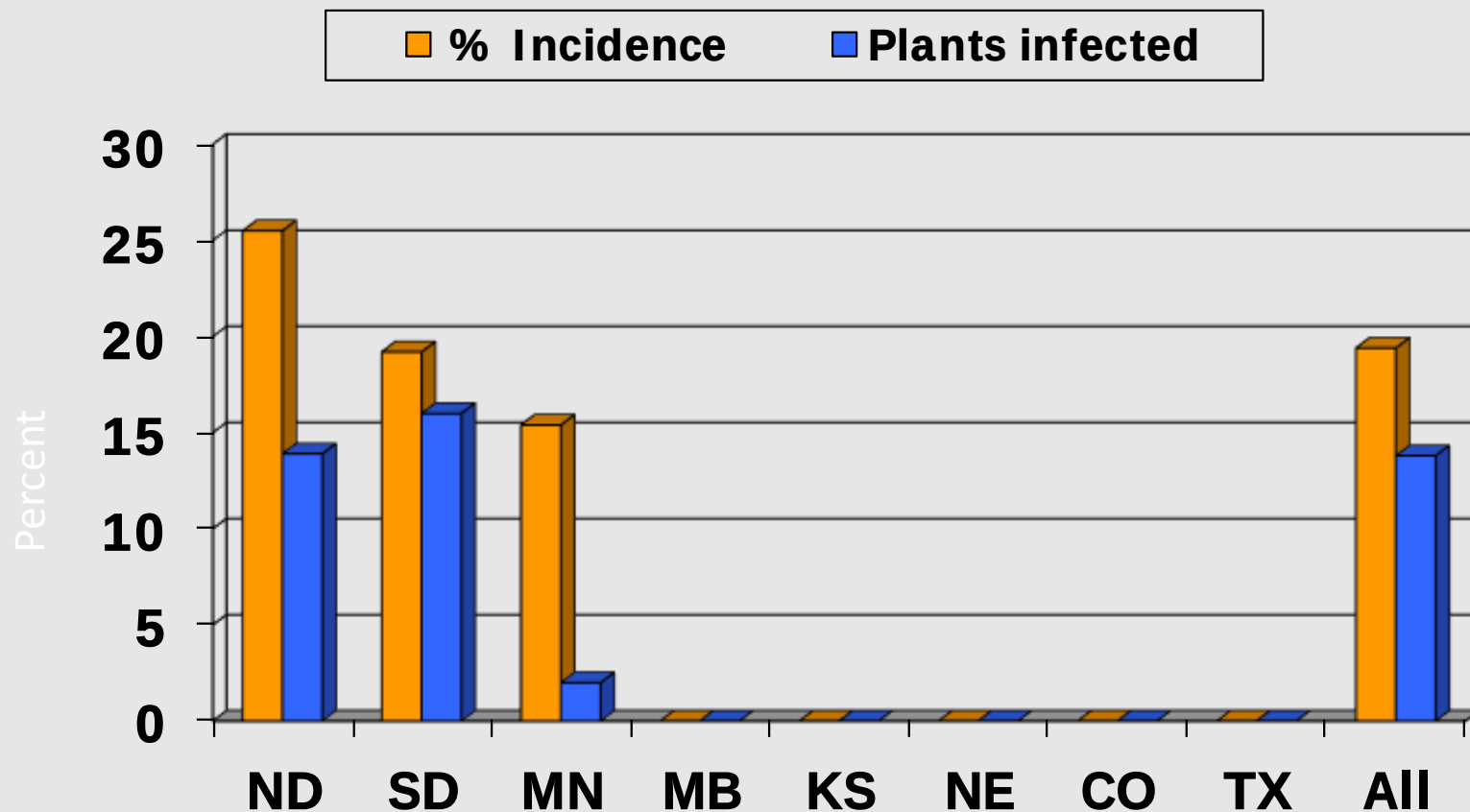
LONG-HORNED BEETLE INCIDENCE & SEVERITY 2015



LONG-HORNED BEETLE SEVERITY 2009-2015



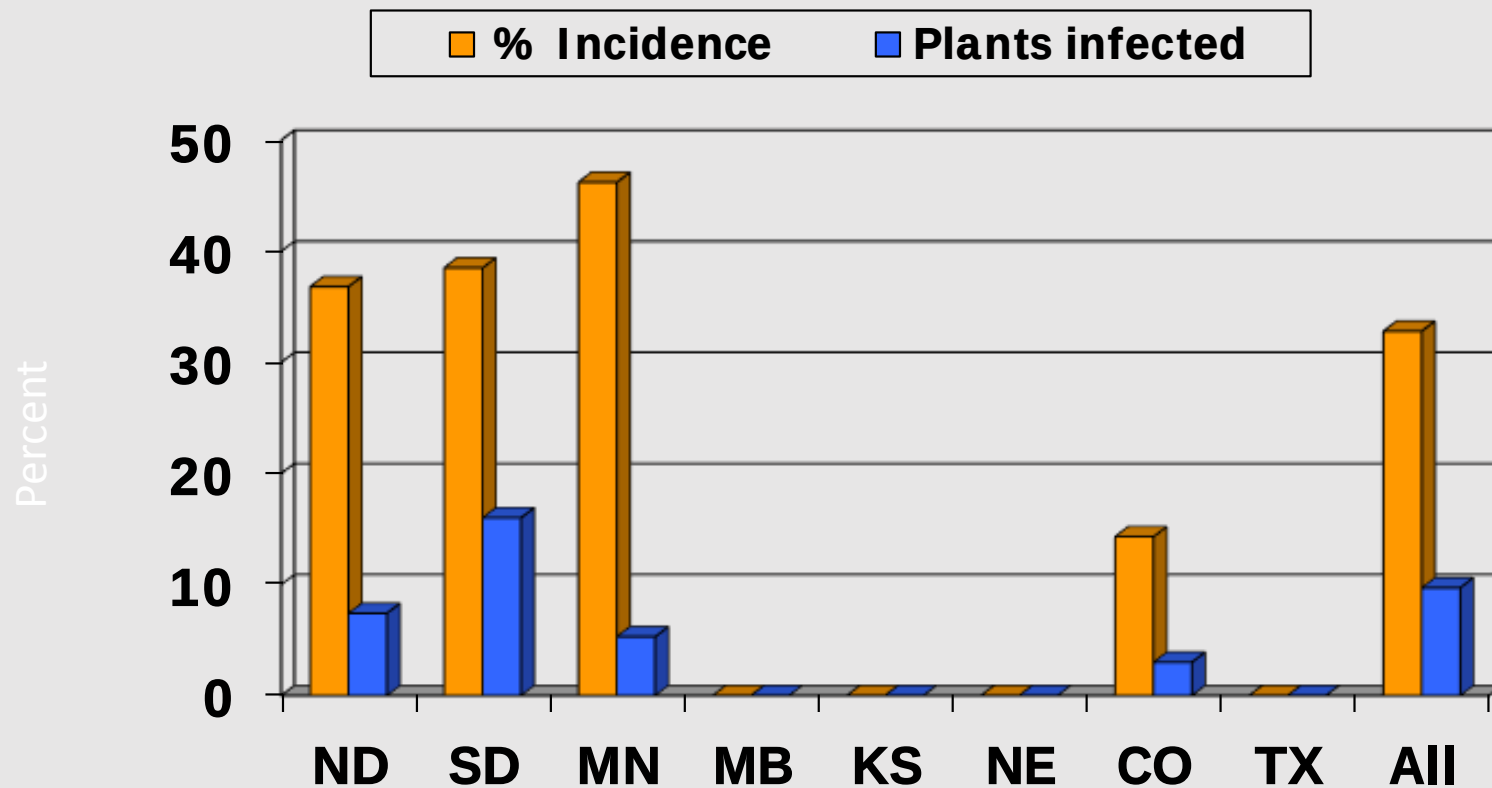
SUNFLOWER MIDGE INCIDENCE & SEVERITY 2015



BUD MOTH DAMAGE IN SUNFLOWER



SUNFLOWER BUD MOTH INCIDENCE & SEVERITY 2015

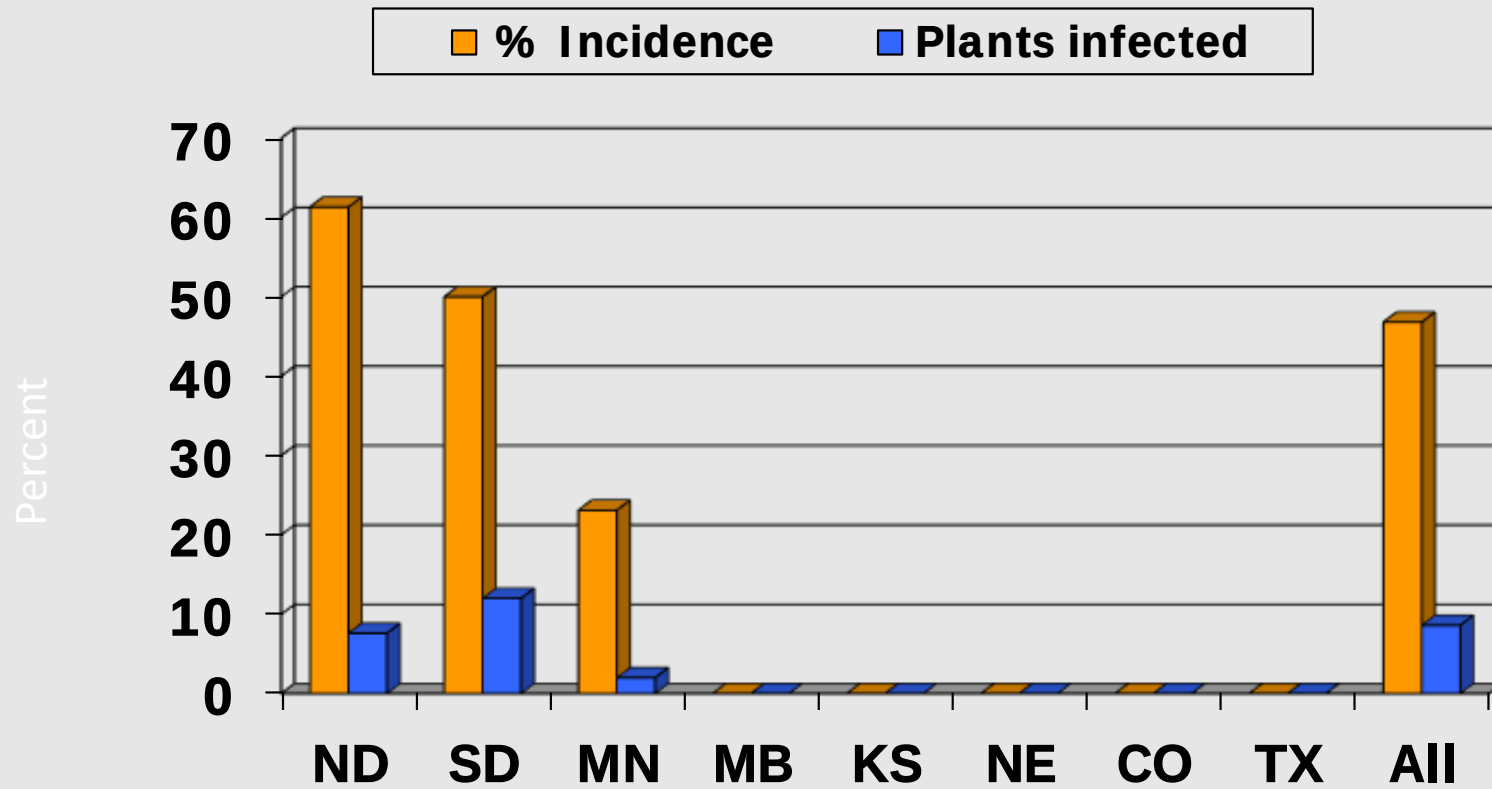


SUNFLOWER SEED MAGGOT DAMAGE



Photo: Dr. J. Knodel

SUNFLOWER SEED MAGGOT INCIDENCE & SEVERITY - 2015



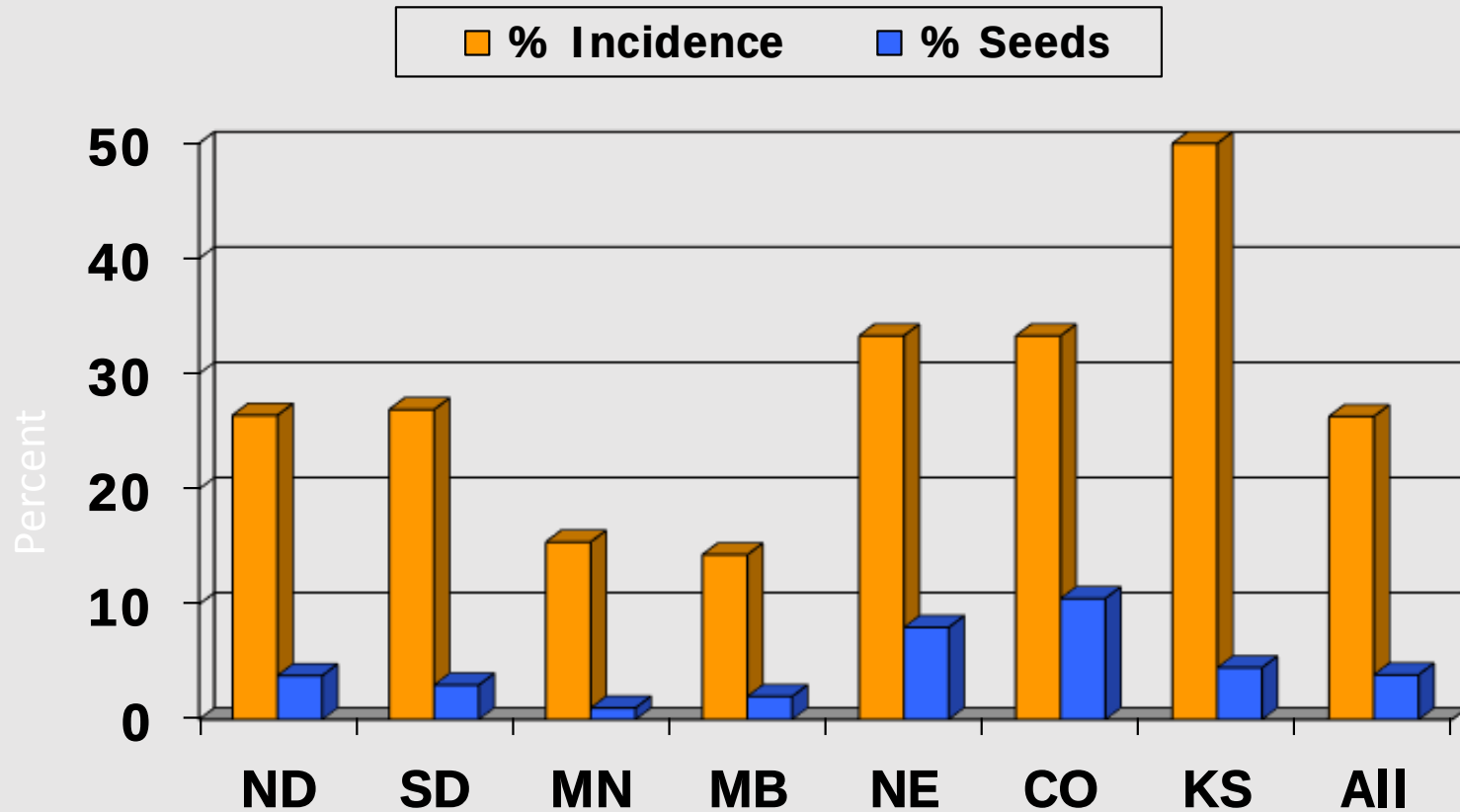


SEED SAMPLE FROM
5 HEADS/FIELD.

SENT TO USDA-FARGO
(JARRAD PRASIFKA) FOR
LAB ANALYSIS

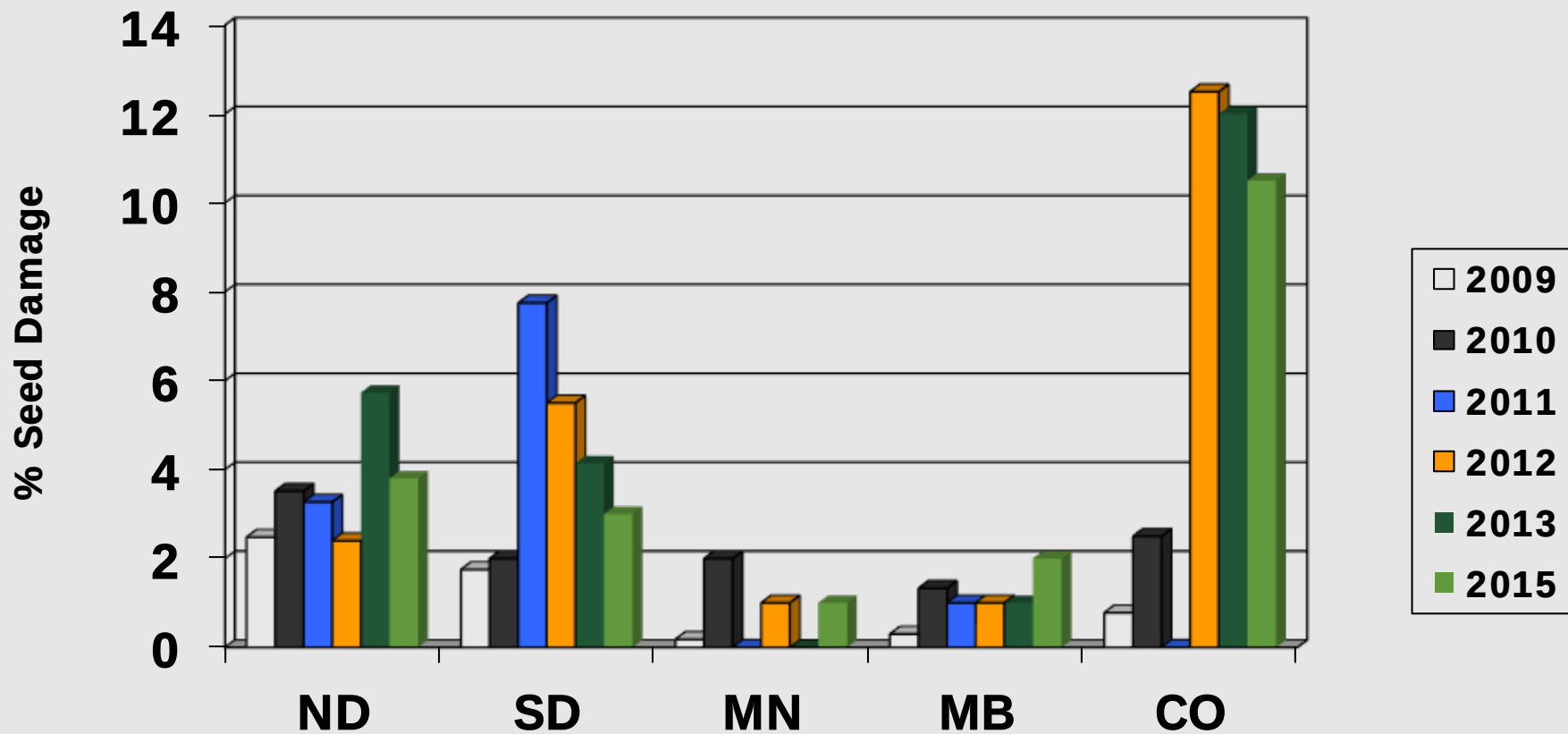


RED SEED WEEVIL INCIDENCE & SEVERITY 2015

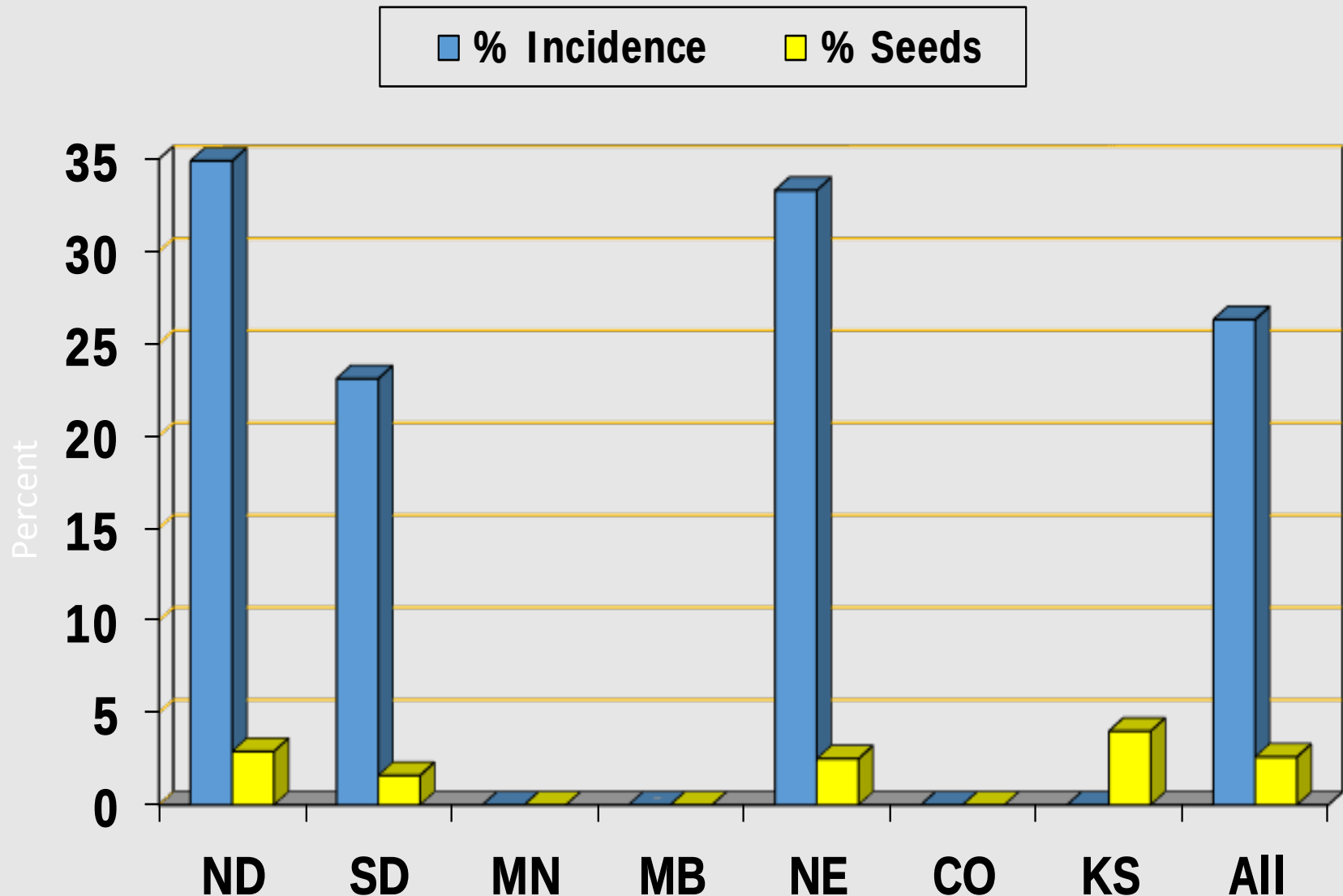


SEED DAMAGE – RED SEED WEEVIL

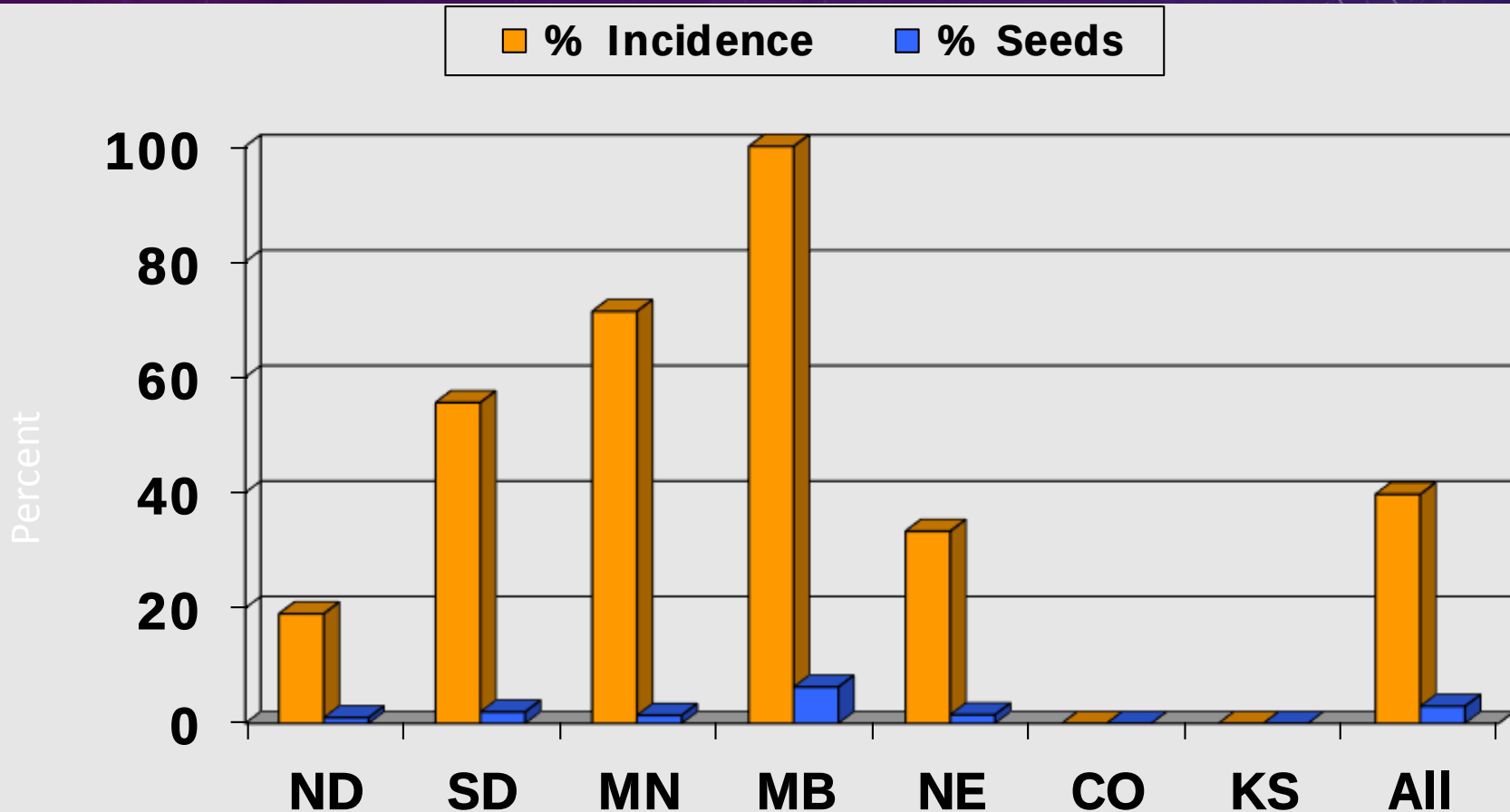
2009-2015



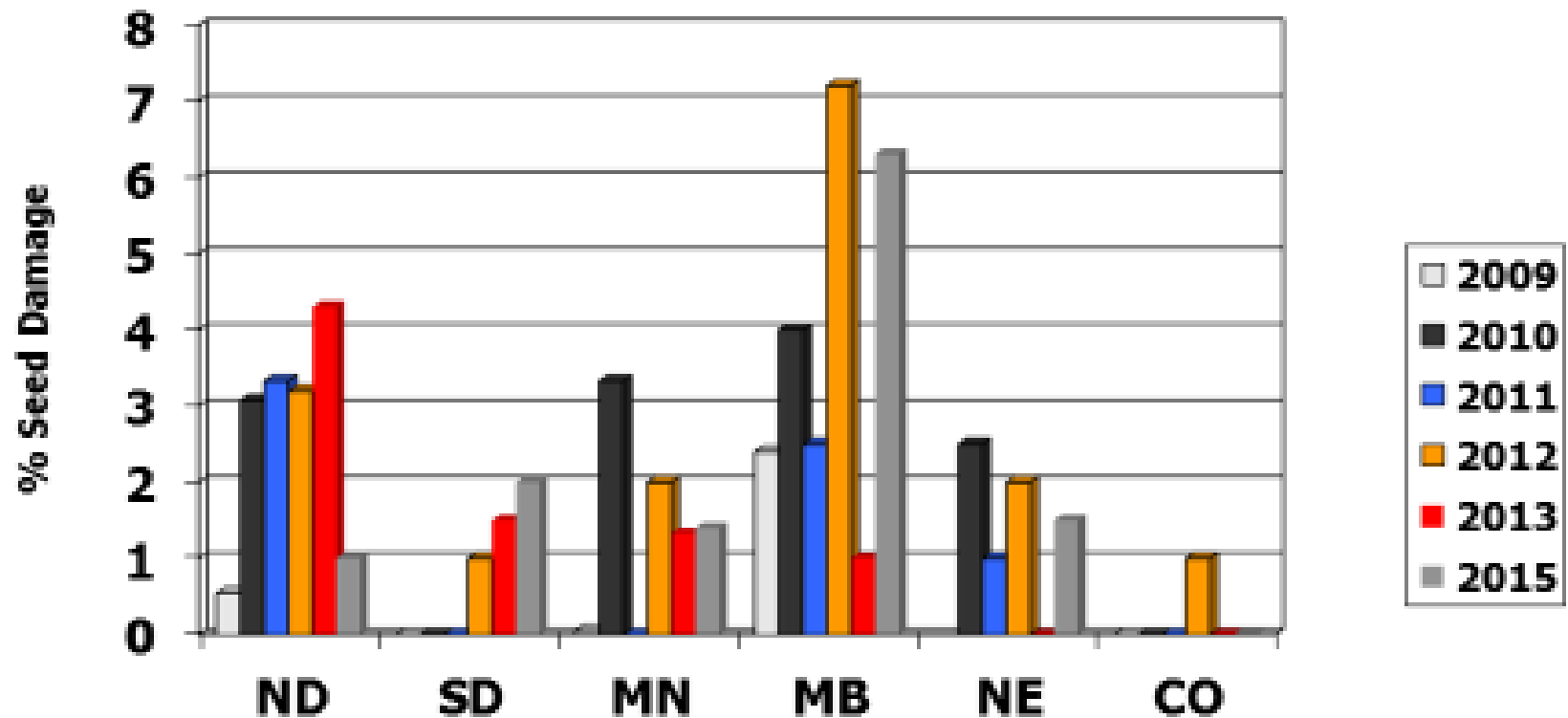
BANDED SUNFLOWER MOTH INCIDENCE AND SEVERITY 2015

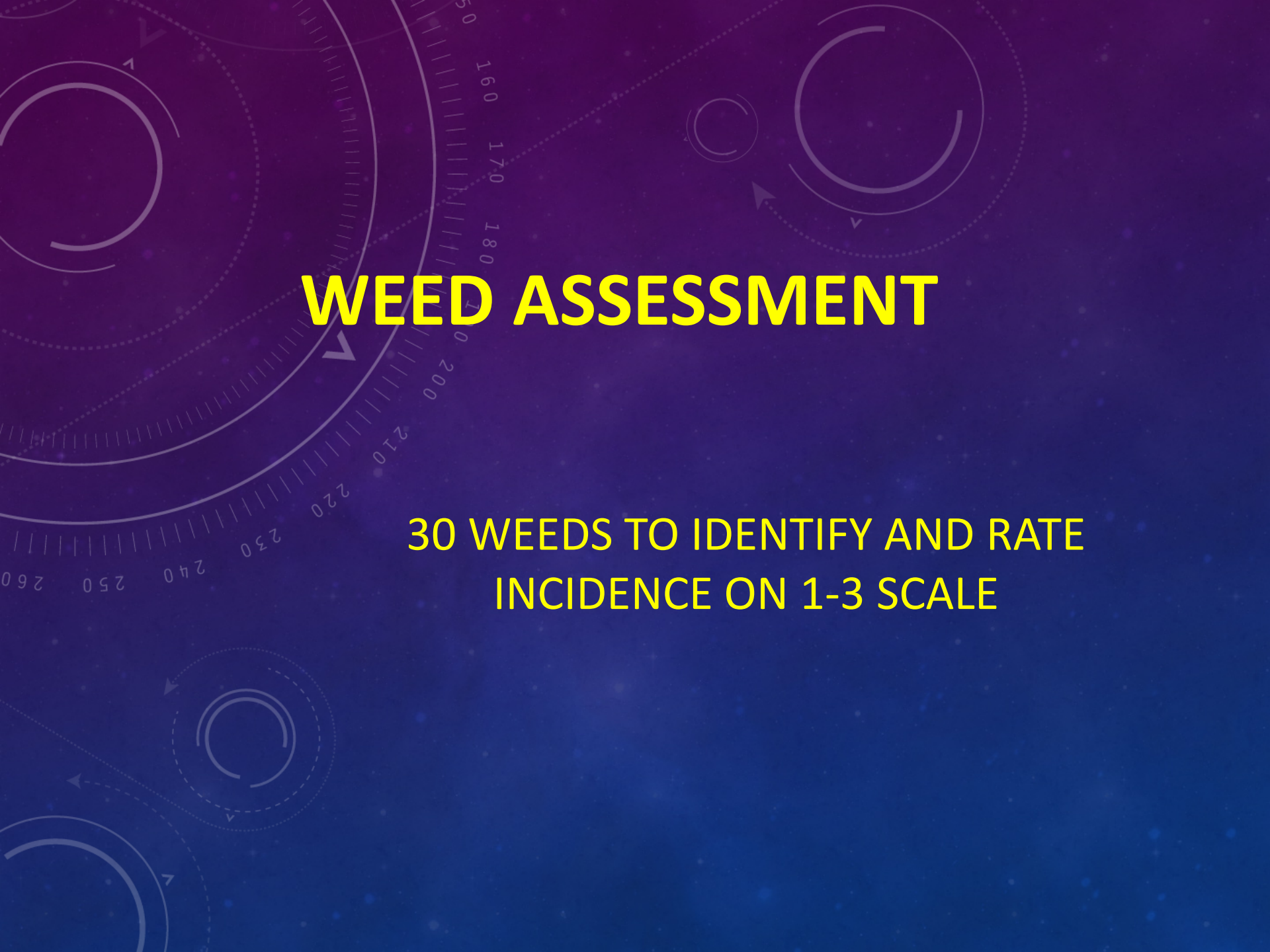


BROWN SPOT INCIDENCE & SEVERITY 2015 (CONFECTION)



Seed Damage - Brown Spot in Sunflower 2009-2015

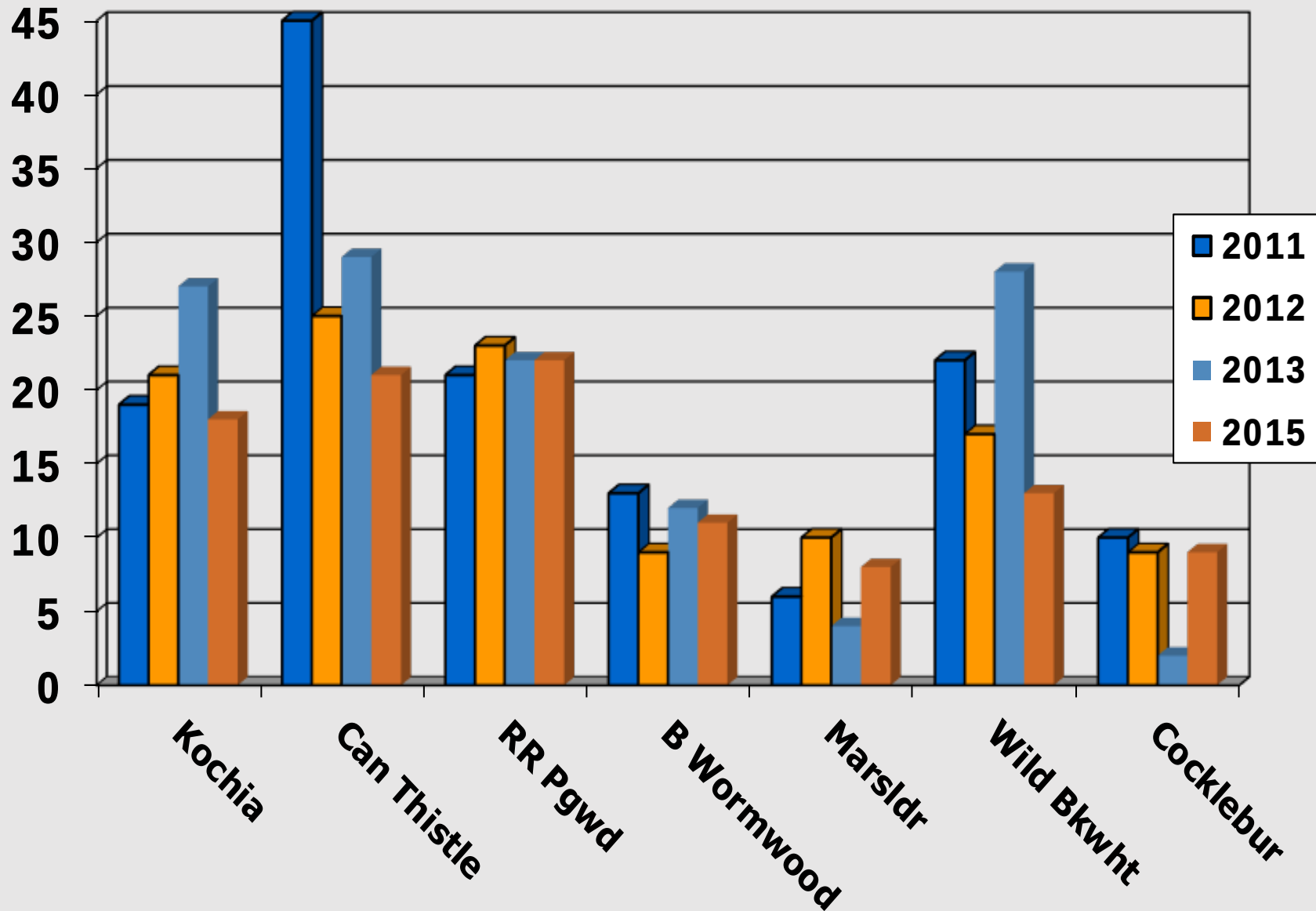


The background is a dark blue gradient with a subtle pattern of white dots. Overlaid on this are several faint, light blue circular elements. On the left, a large circular scale with tick marks and numbers (150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260) is visible. To the right of the scale, there are several concentric circles, some with arrows indicating a clockwise direction. The overall aesthetic is technical and scientific.

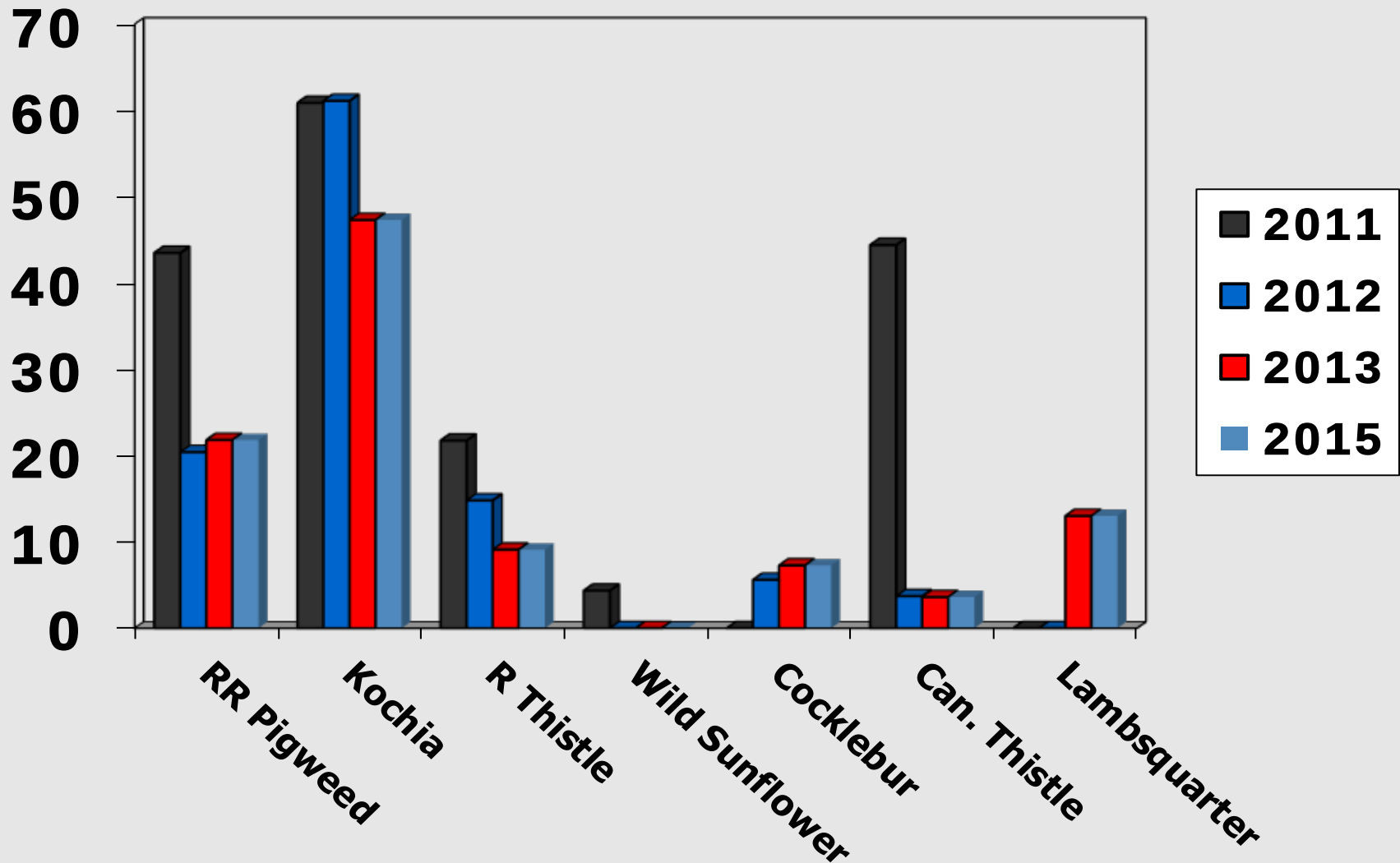
WEED ASSESSMENT

**30 WEEDS TO IDENTIFY AND RATE
INCIDENCE ON 1-3 SCALE**

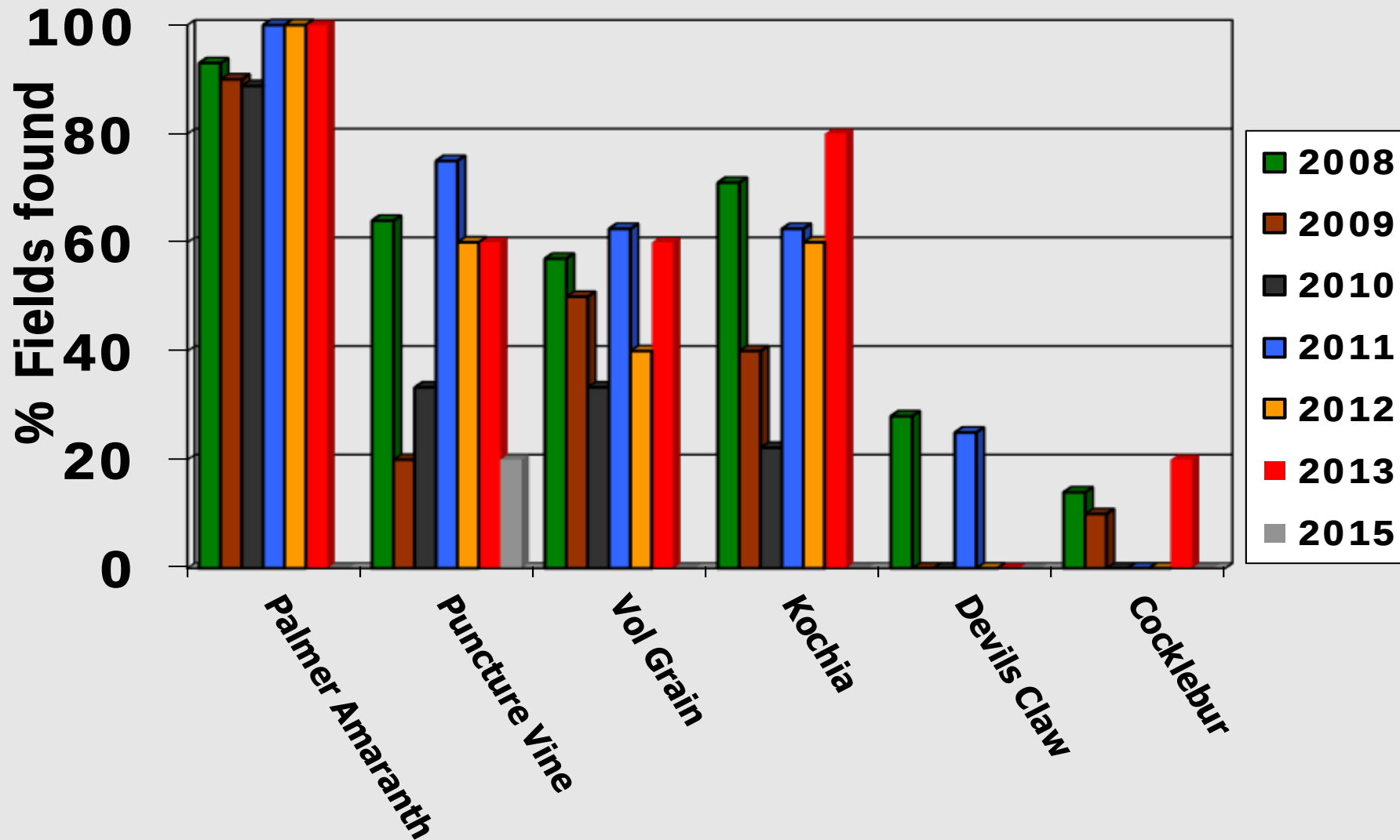
INCIDENCE OF WEEDS ND/MN 2011-2015



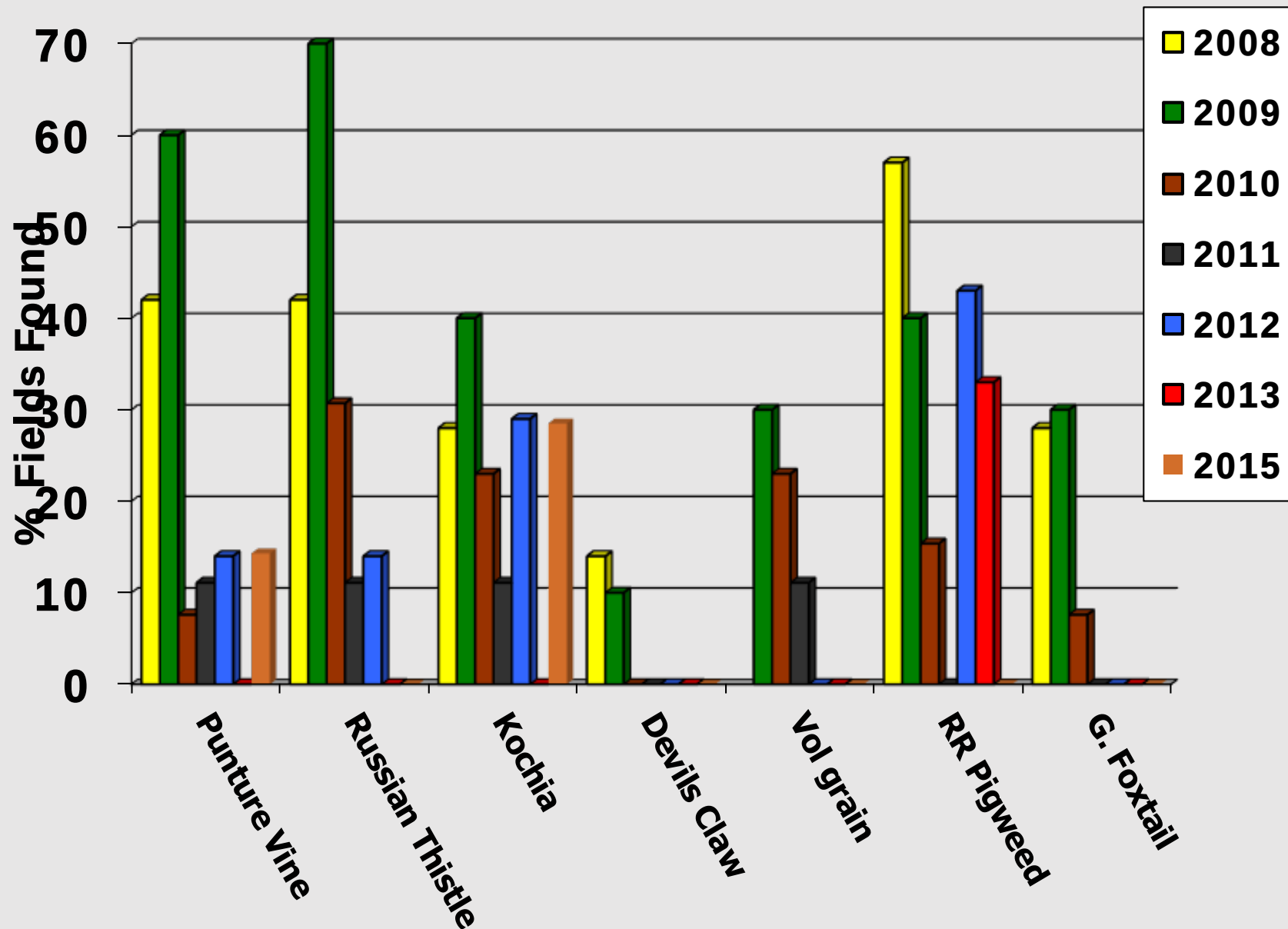
INCIDENCE OF WEEDS SOUTH DAKOTA 2011-2015



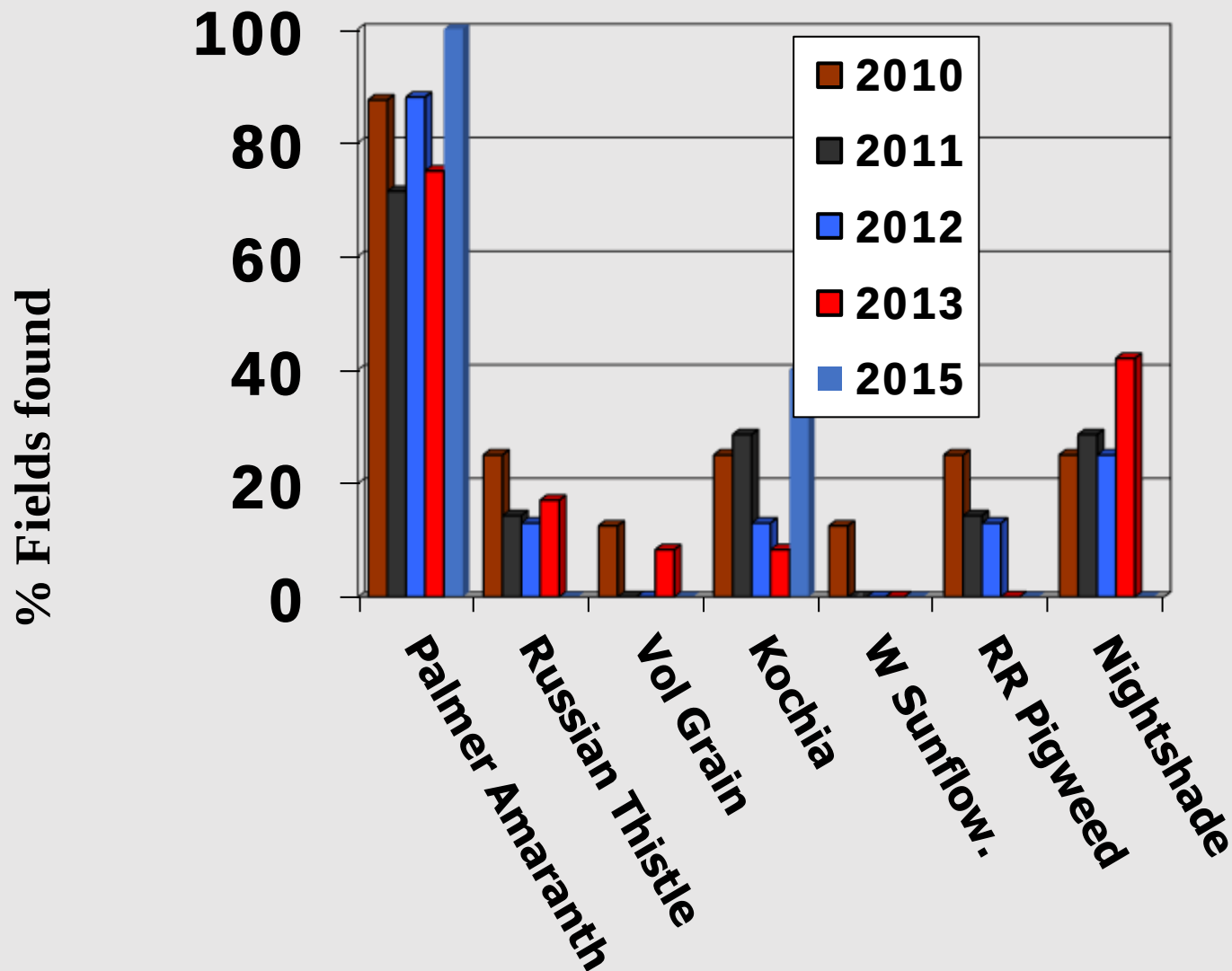
INCIDENCE OF WEEDS IN KANSAS 2008-2015



INCIDENCE OF WEEDS IN COLORADO 2008-2015



INCIDENCE OF WEEDS IN TEXAS 2010-2105



*2015 SUNFLOWER SURVEY
SPONSORED BY THE*

NATIONAL SUNFLOWER ASSOCIATION

