

USA
Sunflower Survey



*Partnership of
University, USDA & Industry*

2013 National Sunflower Association Survey

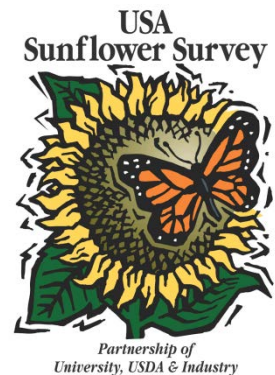
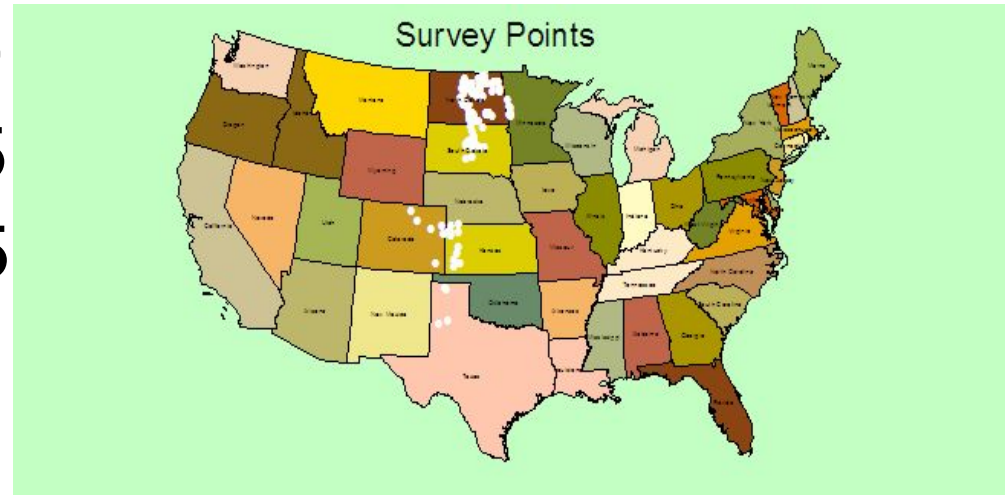
Project Leader:

**Hans Kandel Extension Agronomist
NDSU Plant Science Department**

2013 Sunflower Survey - # Fields

- North Dakota - 100
- Minnesota - 10
- South Dakota - 55
- Kansas - 5
- Colorado - 6
- Nebraska - 6
- Manitoba - 7
- Texas - 12
- Vermont - 8

TOTAL - 209



2013 Sunflower Survey

(Approximately one field stop per 10,000 Acres)

- Fields in 2005 - 146
- Fields in 2006 - 162
- Fields in 2007 - 158
- Fields in 2008 - 162
- Fields in 2009 - 177
- Fields in 2010 - 207
- Fields in 2011 - 155
- Fields in 2012 - 211*
- Fields in 2013 - 209



*Highest # Surveyed

2013 Sunflower Crop Survey Teams

- North Dakota 16 teams
- South Dakota 7 teams
- Minnesota 2 teams
- Colorado 1 team
- Kansas 1 team
- Nebraska 1 team
- Texas 1 team
- Manitoba 1 team
- Vermont 1 team
- Texas 1 team



Total of 32 teams

2013 Sunflower Yield and Management Practices

Team # _____ County _____ Field # _____ Oil (1) _____ Conf (2) _____.

GPS North _____ GPS West _____ Dryland (1) _____ Irrigated (2) _____.

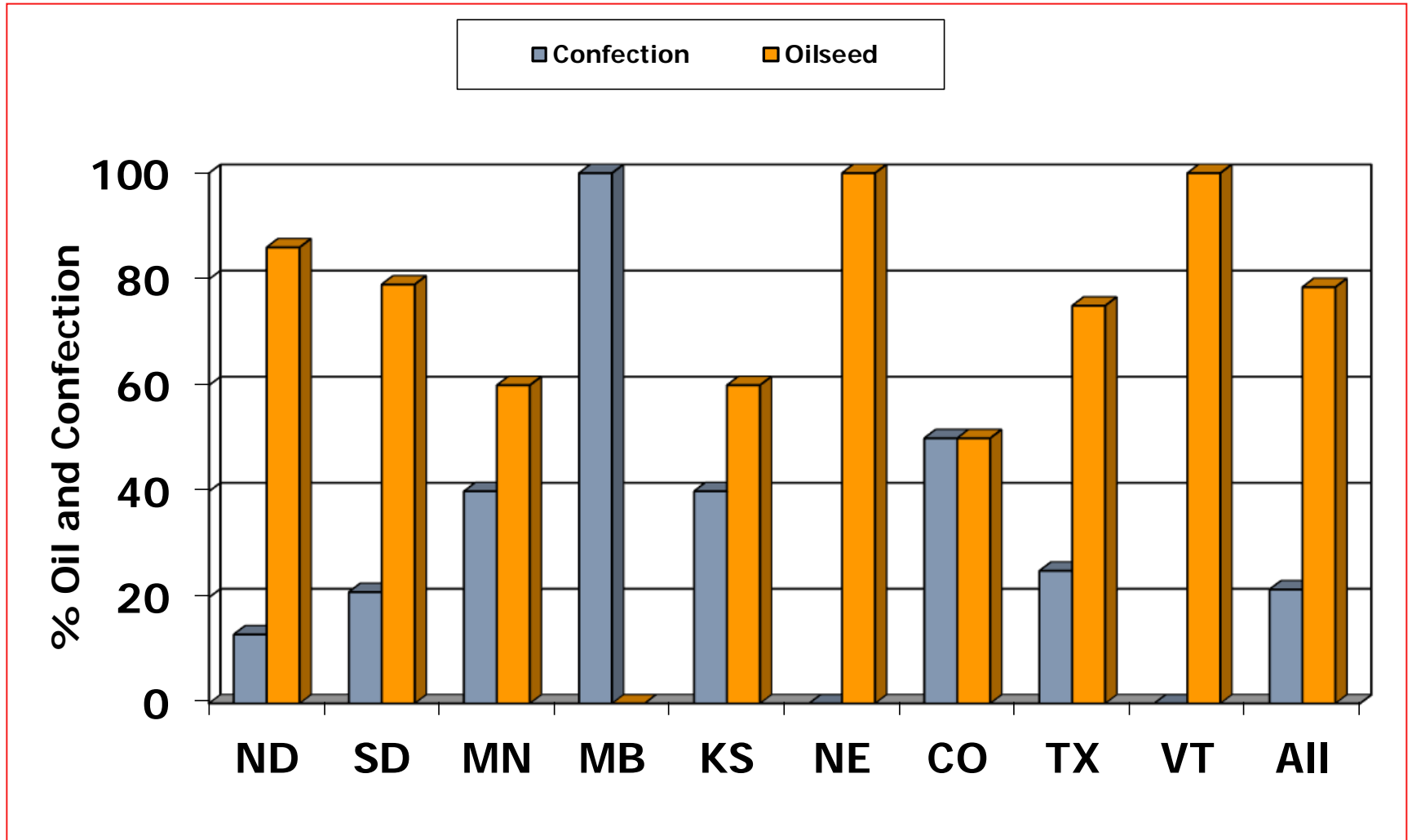
Yield Data:		Plants / Pop.	Head Diameter	Seed Size	% Good Seed	Center Seed Set	Previous Crop
Average							

Calculation:

2450	x	_____	x	_____	x	_____	x	_____	x	_____	=	_____	
		Plant Population multiplier		Head Diameter multiplier		Seed Size multiplier		% Good Seed		Center Seed Set		Bird Damage Multiplier	Est. Yield

Management Practices:	Row Spacing	20" or less - 1 _____	21" or Greater - 2 _____
	No-till - 1 _____	Min-till - 2 _____	Conv-till- 3 _____

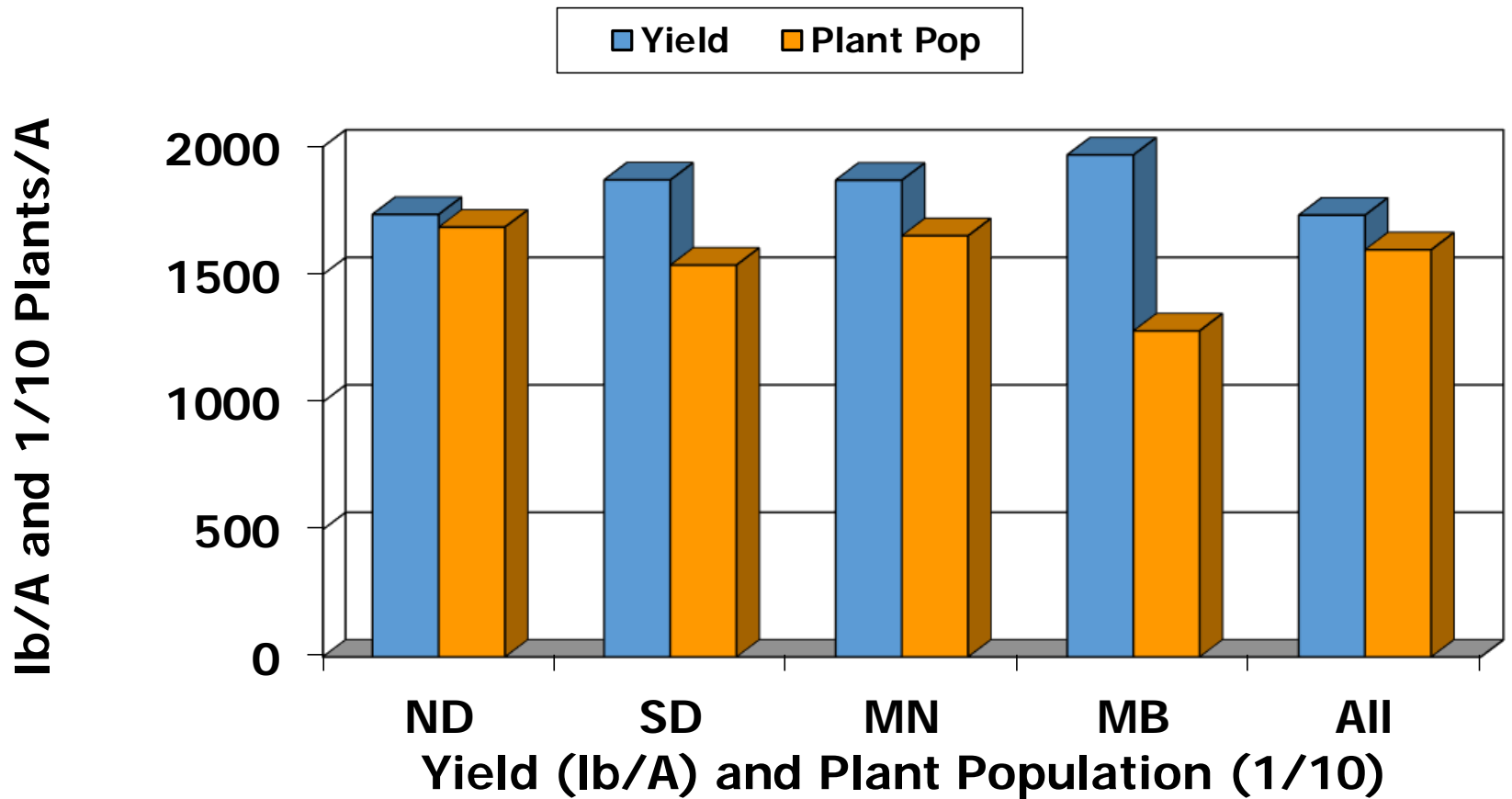
% Confection and Oilseed Sunflower-2013 Survey



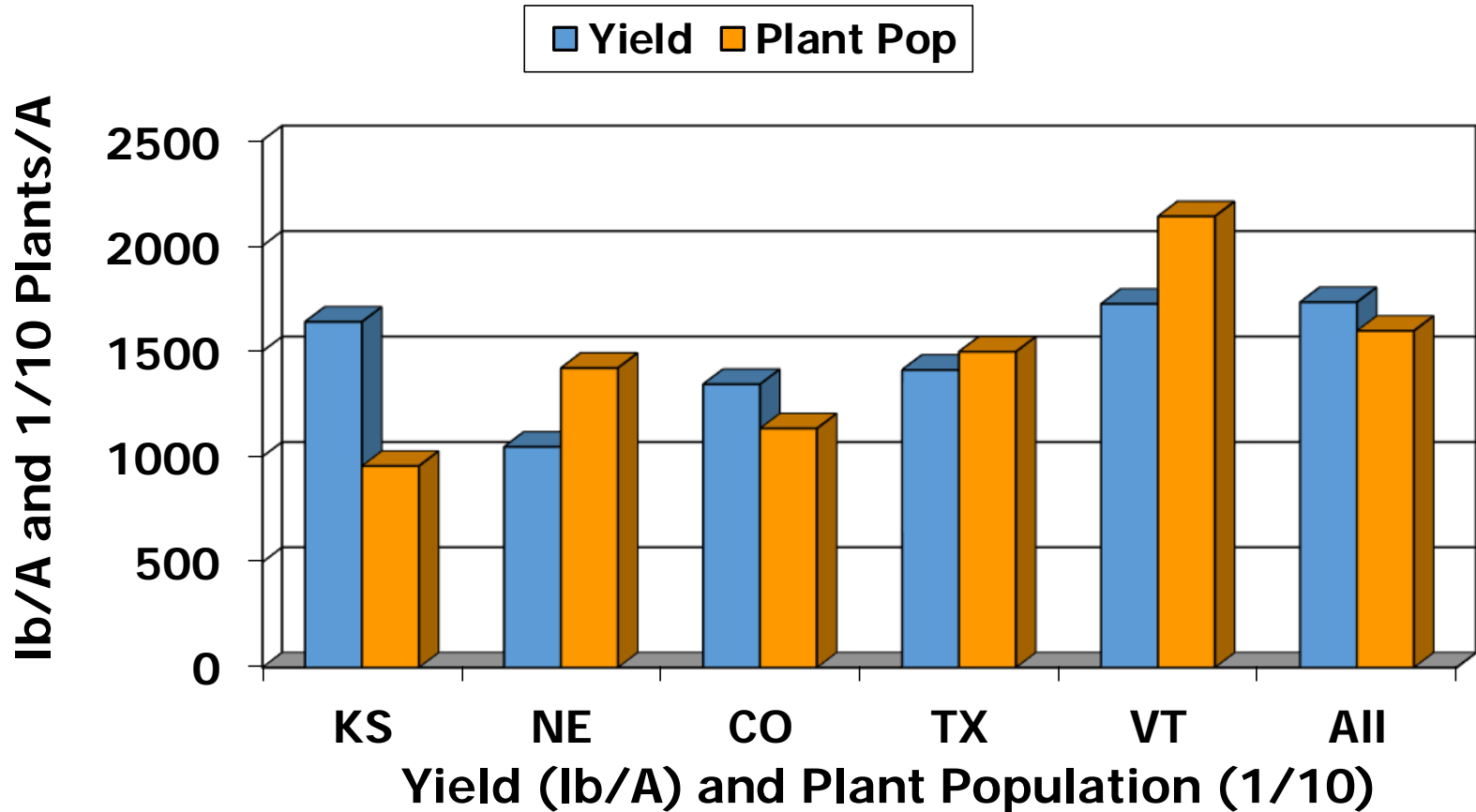
Plant Population and Yield Determination



Sunflower Yield and Plant Population: 2013



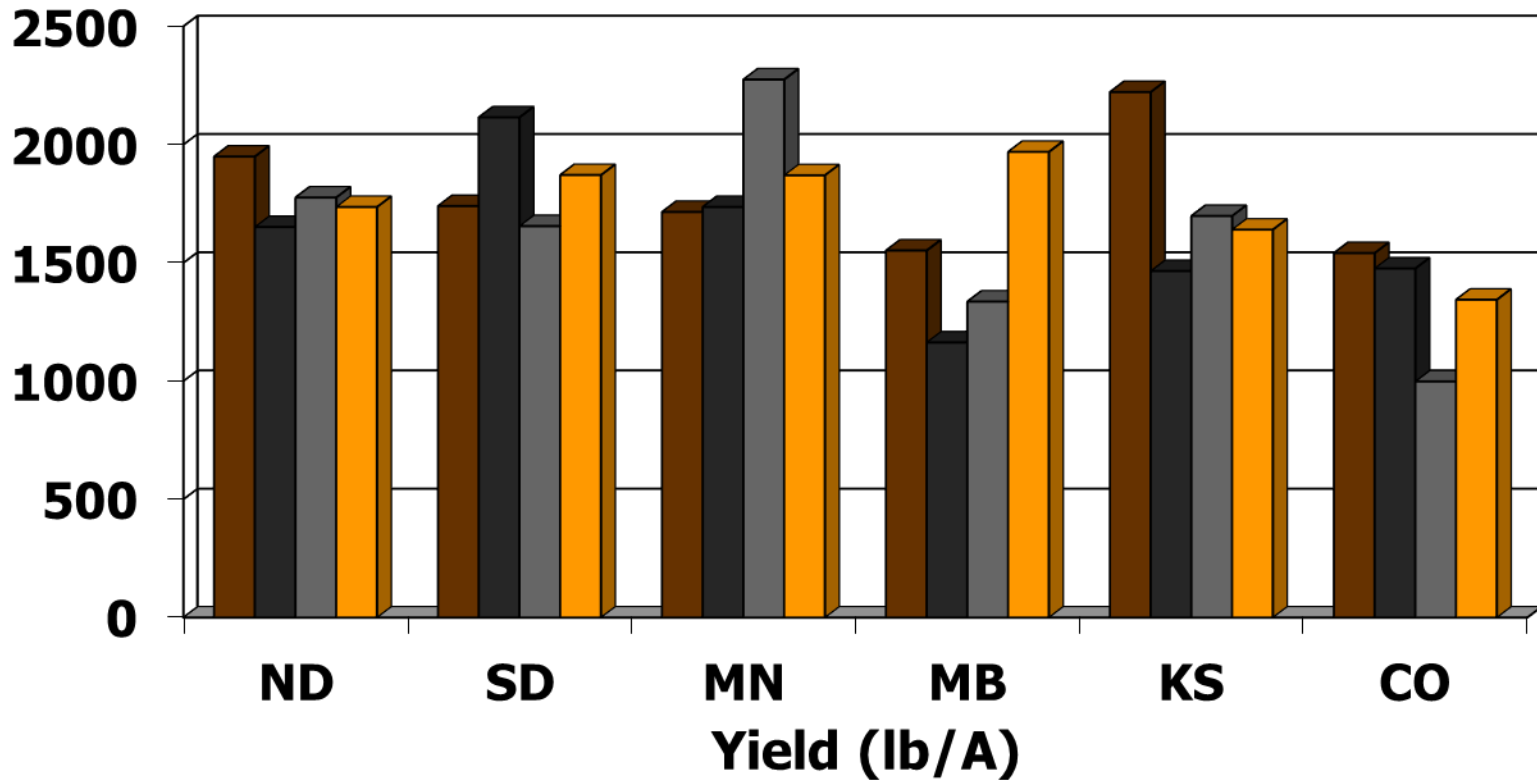
Sunflower Yield and Plant Population: 2013



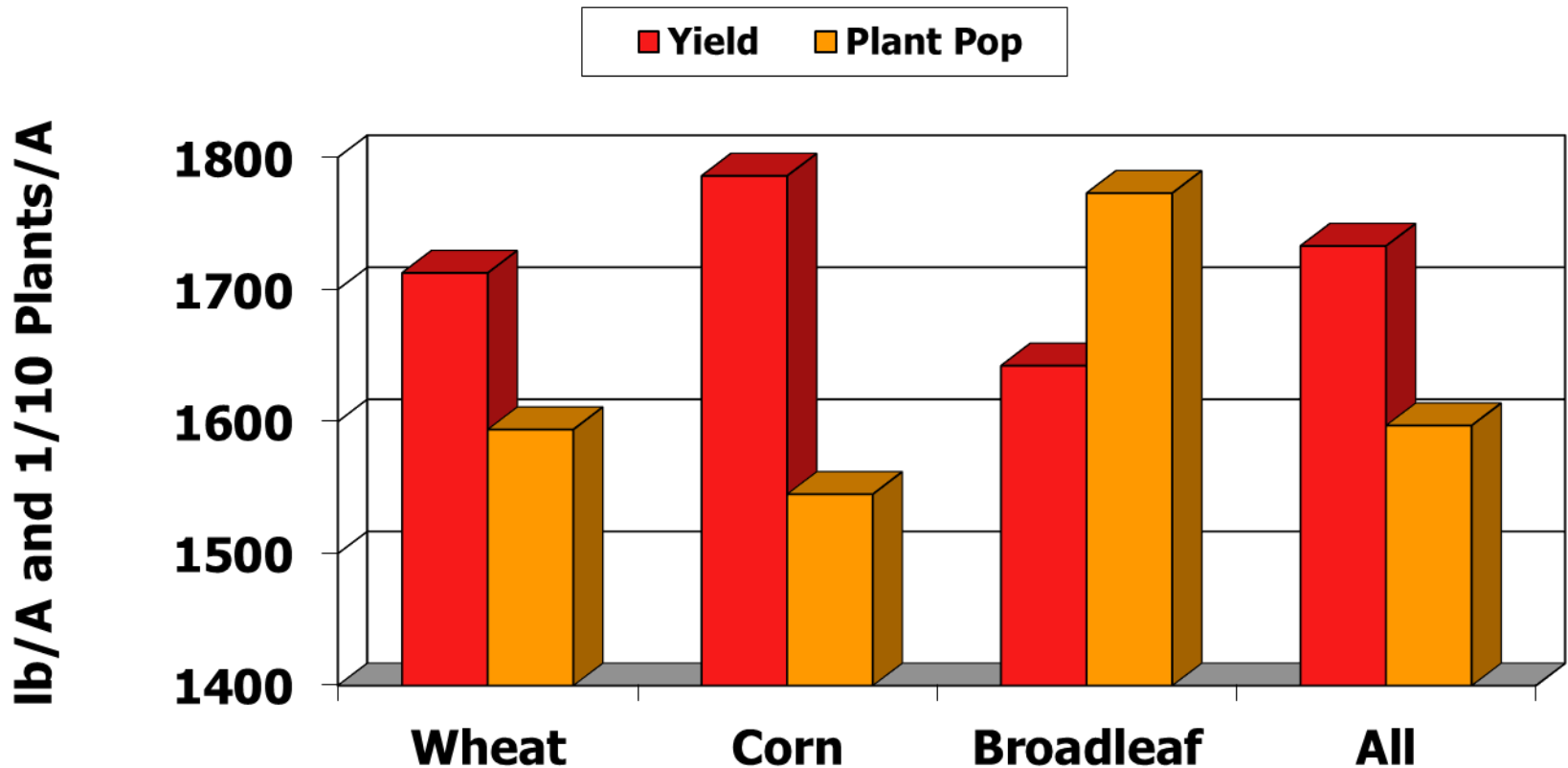
Sunflower Yield : lb/a

2010-2013

■ 2010 ■ 2011 ■ 2012 ■ 2013



2013 Sunflower Yield and Plant Population in Rotation



2013 #1 Yield Limiting Factors - combined (209 Fields)

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



Solid Seeded Sunflower



Plant spacing within row



2013 #2 Yield Limiting Factors - combined (209 Fields)

- Plant spacing within row 10 %
- Uneven plant growth 2 %
- Weeds 6 %
- Insects 4 %
- Disease 9 %
- Birds 2 %
- Lodging 11 %
- Drought 7 %
- Hail 3 %
- Other 6 %
- No Problem 40 %



2013 #1 Yield Limiting Factors - North Dakota (100 Fields)

- Plant spacing 26 %
- Disease 21 %
- Lodging 10 %
- Drought 9 %
- No Problem 9 %
- Birds 9 %
- Other 6 %
- Weeds 4 %
- Uneven plant growth 2 %
- Hail 2 %
- Insects 1 %



2013 #2 Yield Limiting Factors - North Dakota (100 Fields)

- No Problem 40 %
- Disease 11 %
- Plant spacing 11 %
- Lodging 10 %
- Drought 7 %
- Other 7 %
- Weeds 5 %
- Insects 5 %
- Birds 1 %
- Hail 2 %
- Uneven plant growth 1 %





2013 # 1 and #2

Yield Limiting Factors South Dakota (55 Fields)

#1 Factor

- Plant Spacing 36 %
- Drought 14 %
- Lodging 15 %
- Other 13 %
- Disease 7 %
- No problem 4 %
- Weeds 4 %
- Birds 4 %
- Uneven growth 3 %

#2 Factor

- No Problem 26 %
- Lodging 20 %
- Plant spacing 16 %
- Drought 13 %
- Weeds 7 %
- Disease 6 %
- Other 6 %
- Hail 4 %
- Insects 2 %

Most Limiting Factors 2010 - 2013

Sunflower Surveys.

Limiting factor	<u>2010</u>		<u>2011</u>		<u>2012</u>		<u>2013</u>	
	1st	2nd	1st	2nd	1st	2nd	1st	2nd
	-----Percent-----							
Drought	5	2	8	3	29	7	15	7
Plant spacing	18	15	18	17	18	14	26	10
No problem	12	35	14	30	13	34	11	41
Weeds	10	11	8	10	8	11	4	6
Disease	21	8	16	10	7	7	17	9

¹Based on observations of 207 fields in 2010, 155 in 2011, 211 in 2012, and 209 in 2013.

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Top Most Limiting Factors 2010 - 2013 Sunflower Surveys.

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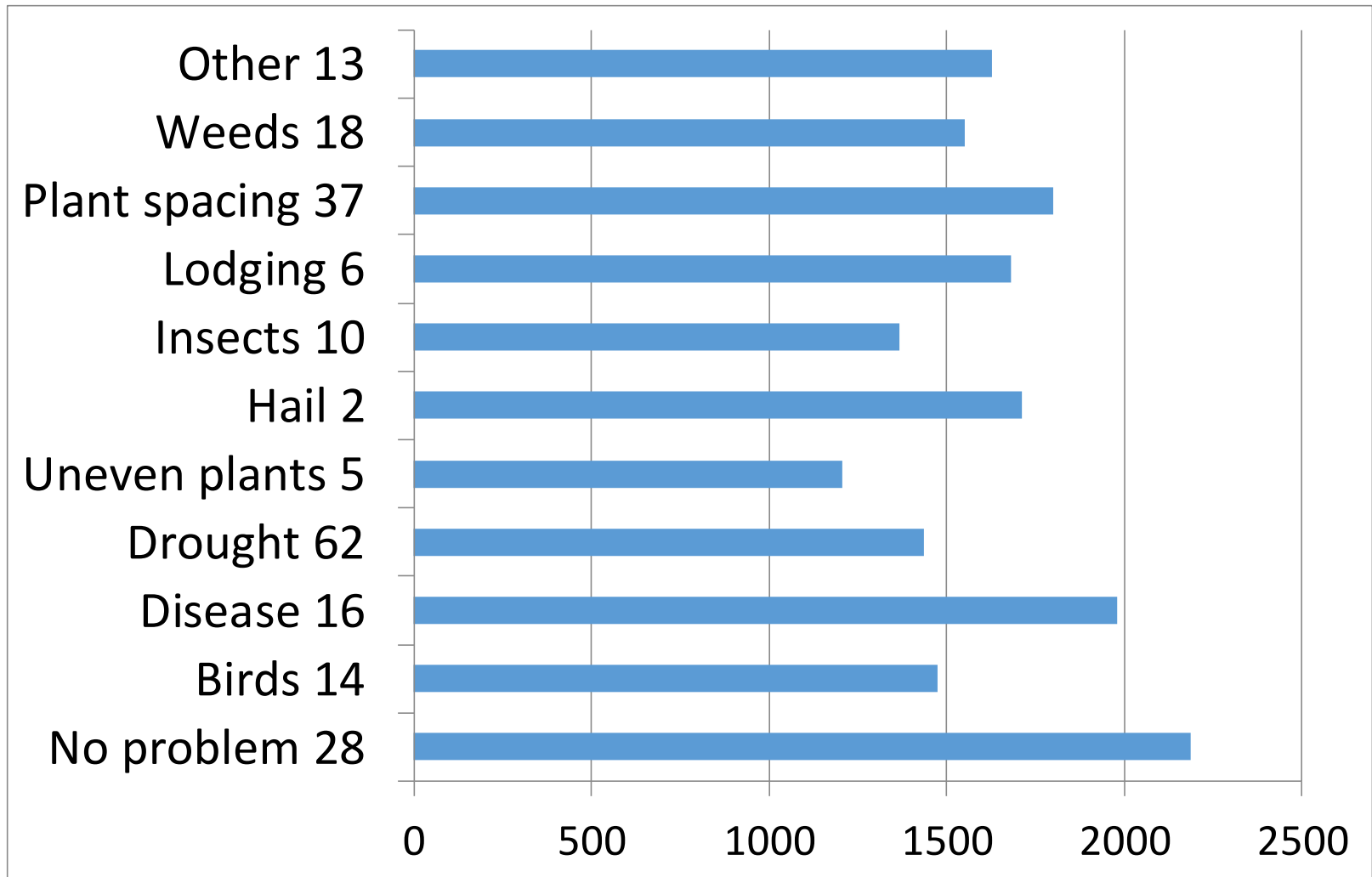
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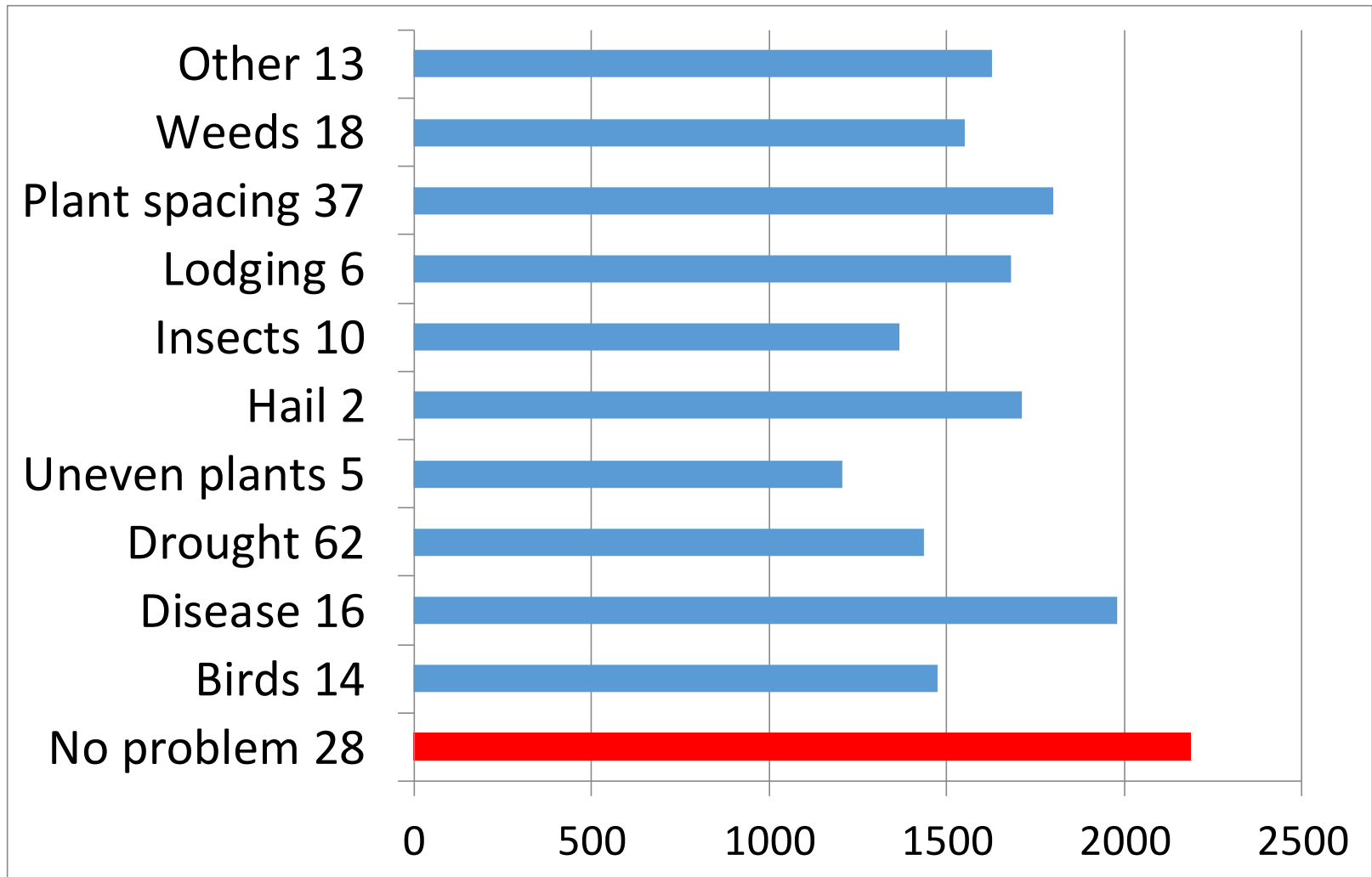
¹Based on observations of 207 fields in 2010, 155 in 2011, 211 in 2012, and 209 in 2013.

Yield Limiting factor and Yield 2012



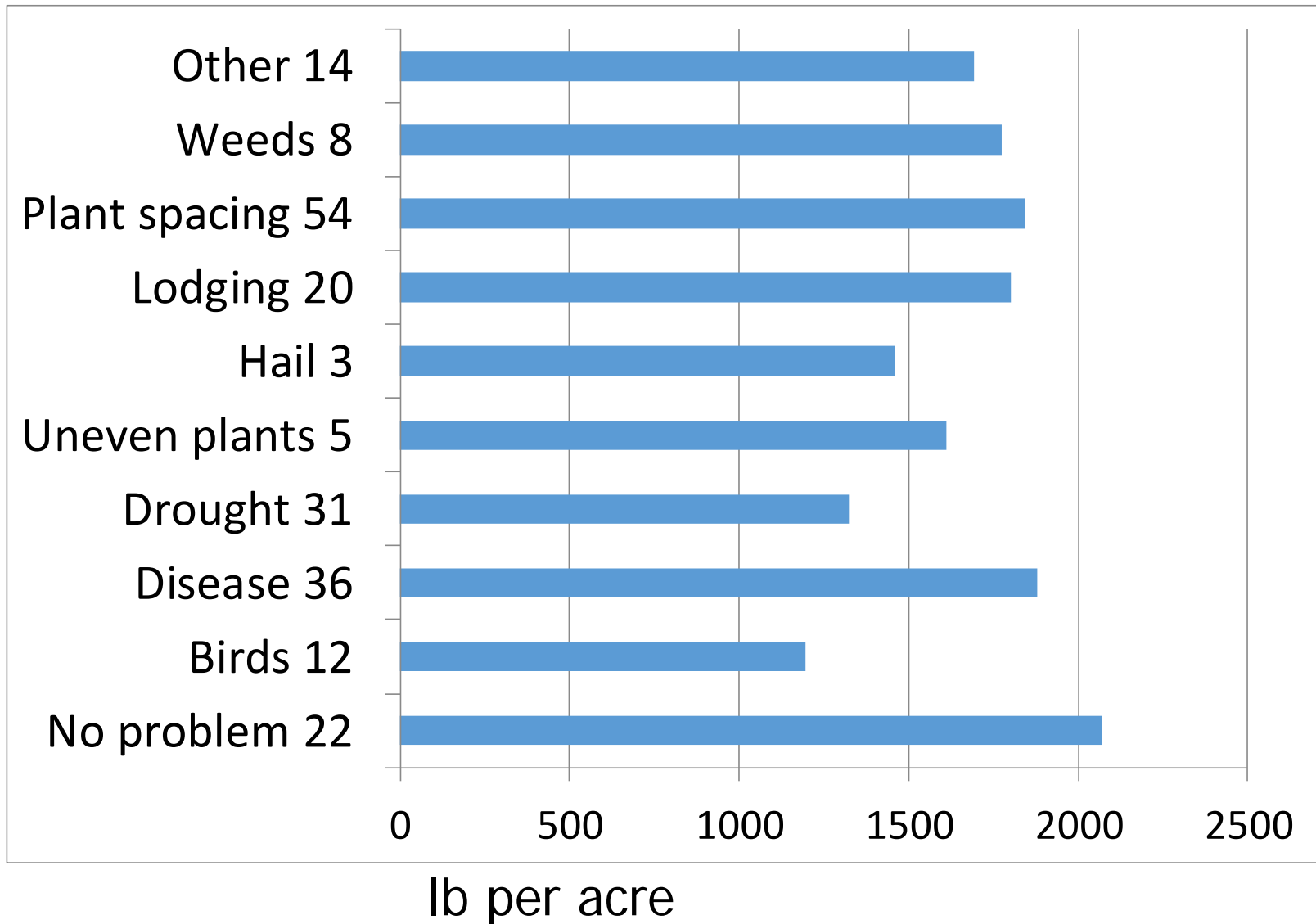
lb per acre

Yield Limiting factor and Yield 2012

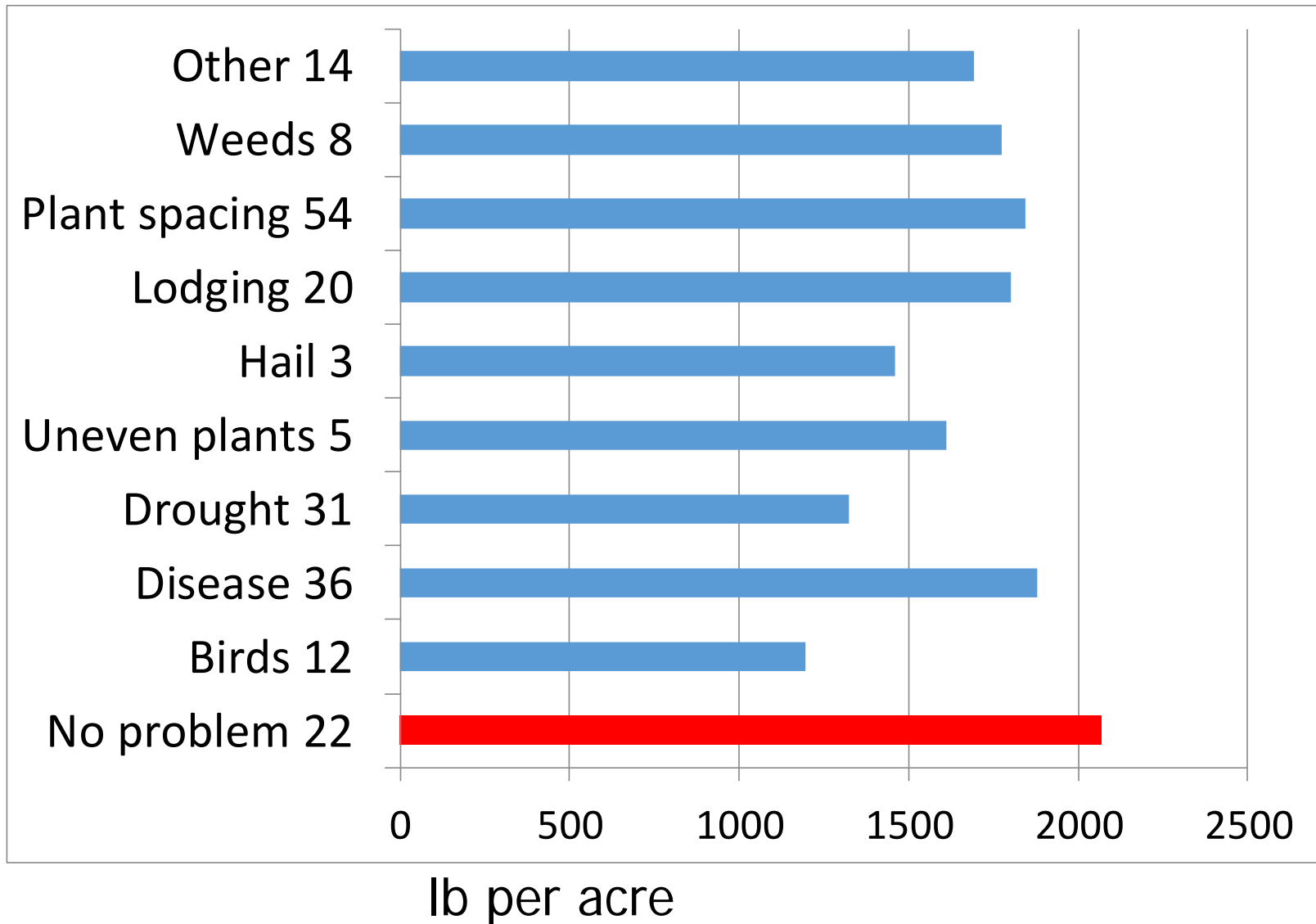


lb per acre

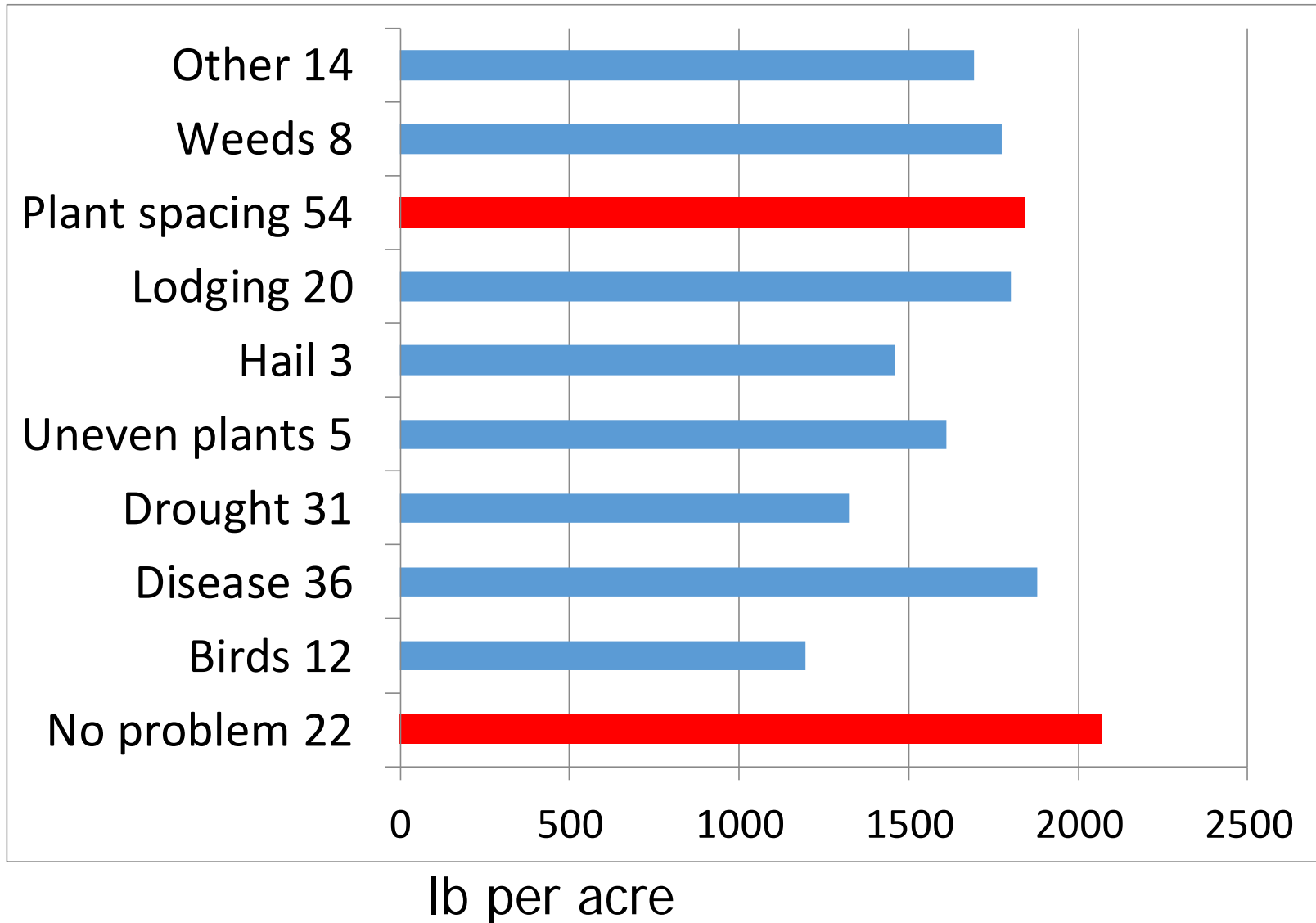
Yield Limiting factor and Yield 2013



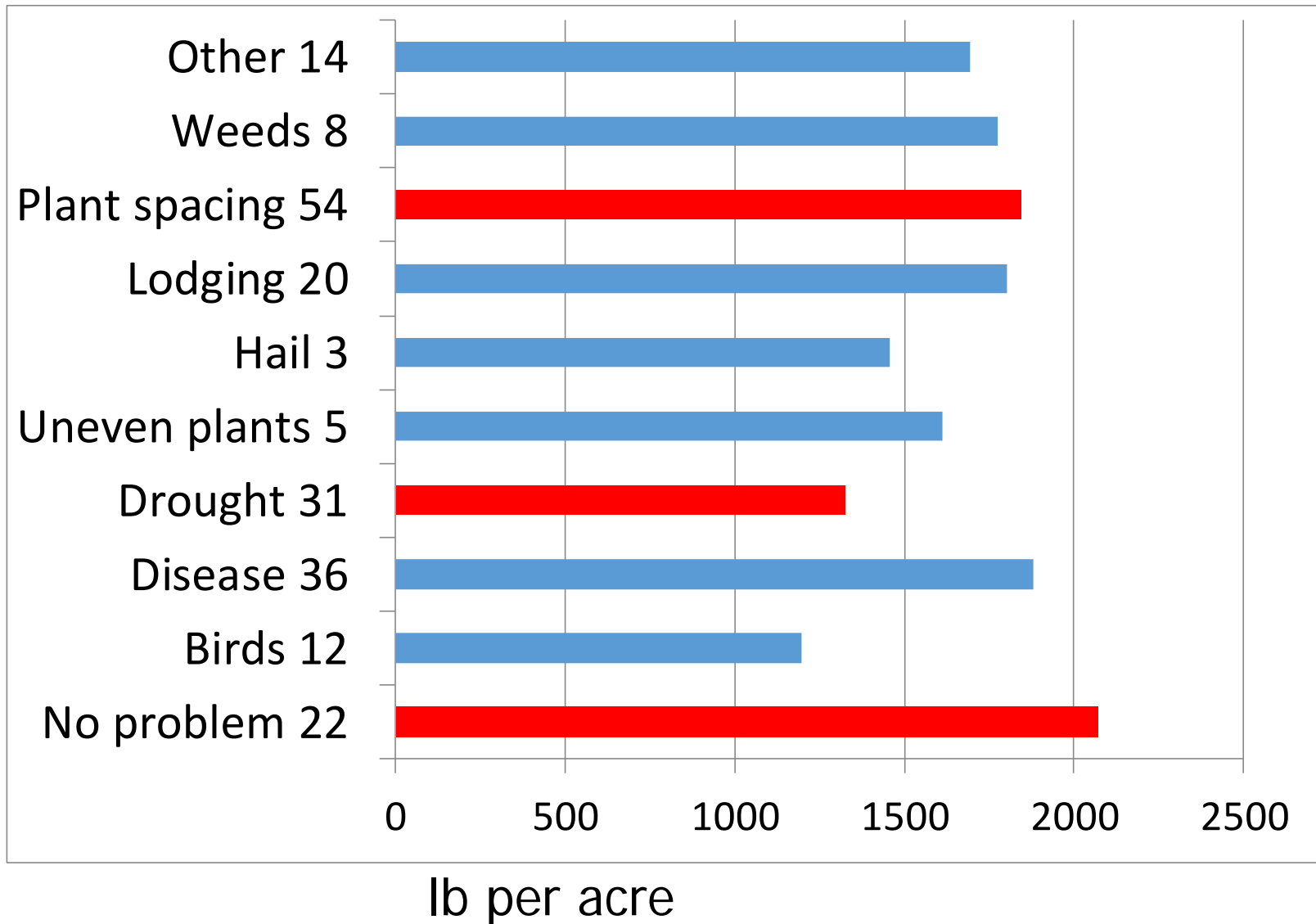
Yield Limiting factor and Yield 2013



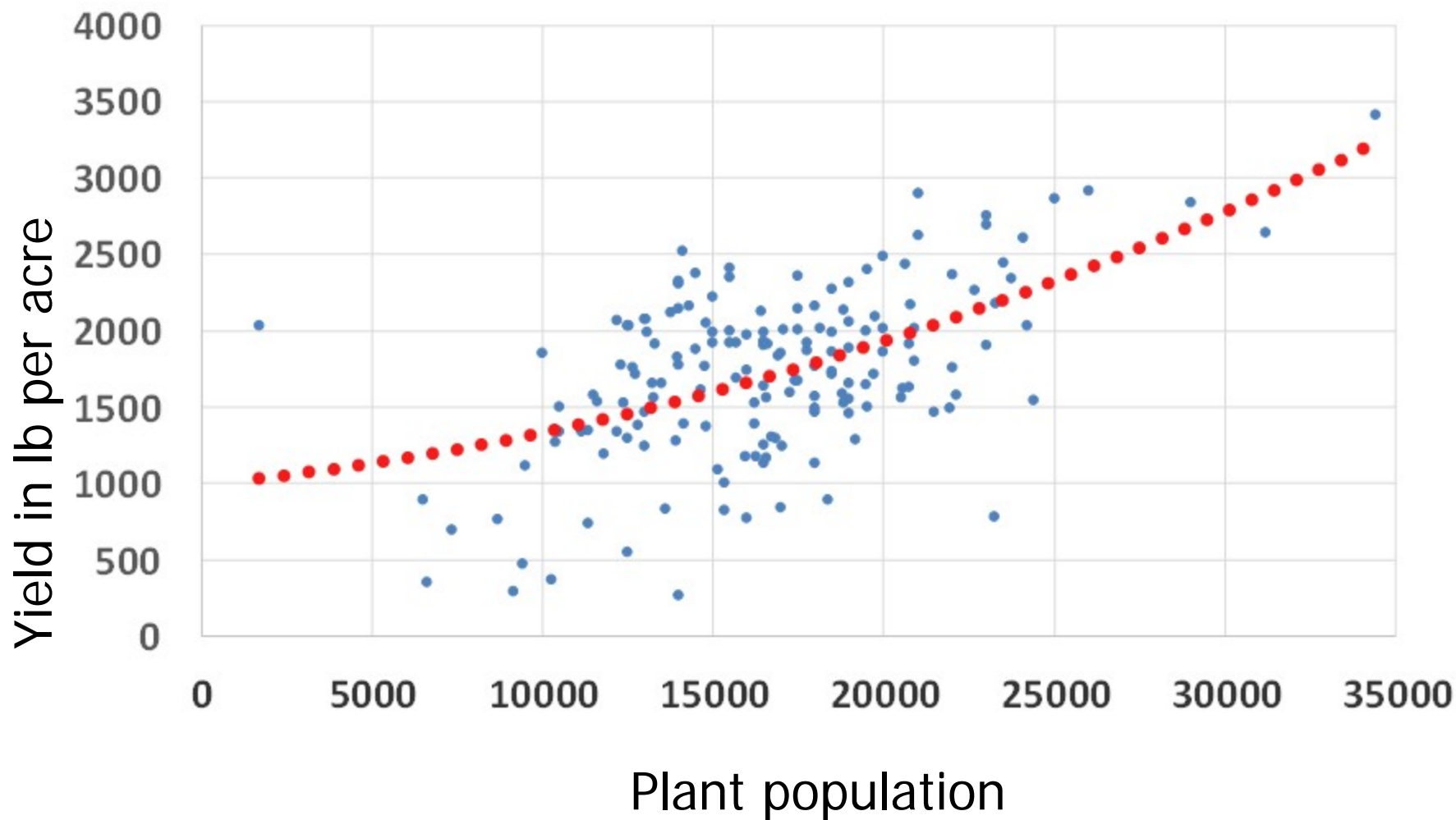
Yield Limiting factor and Yield 2013



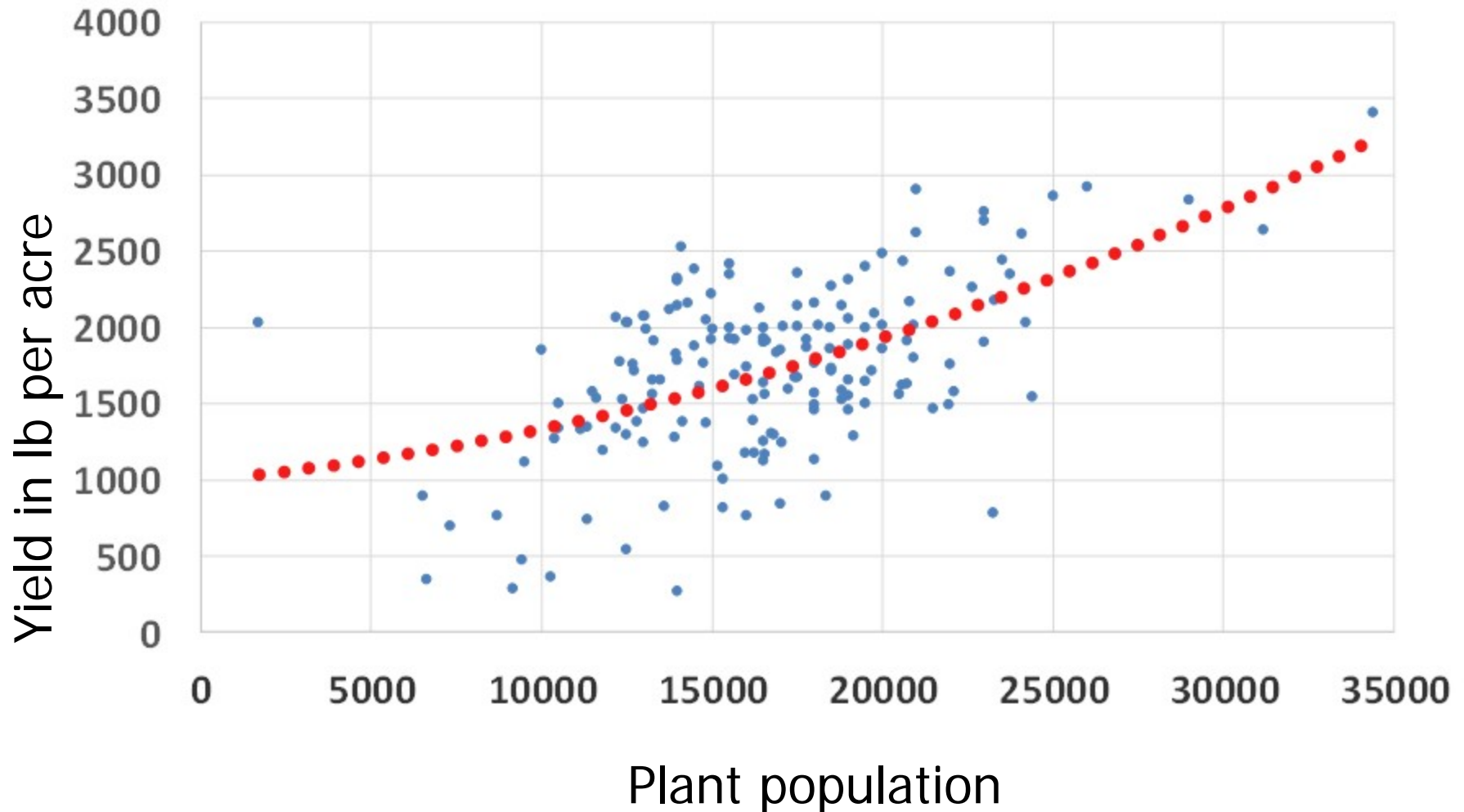
Yield Limiting factor and Yield 2013



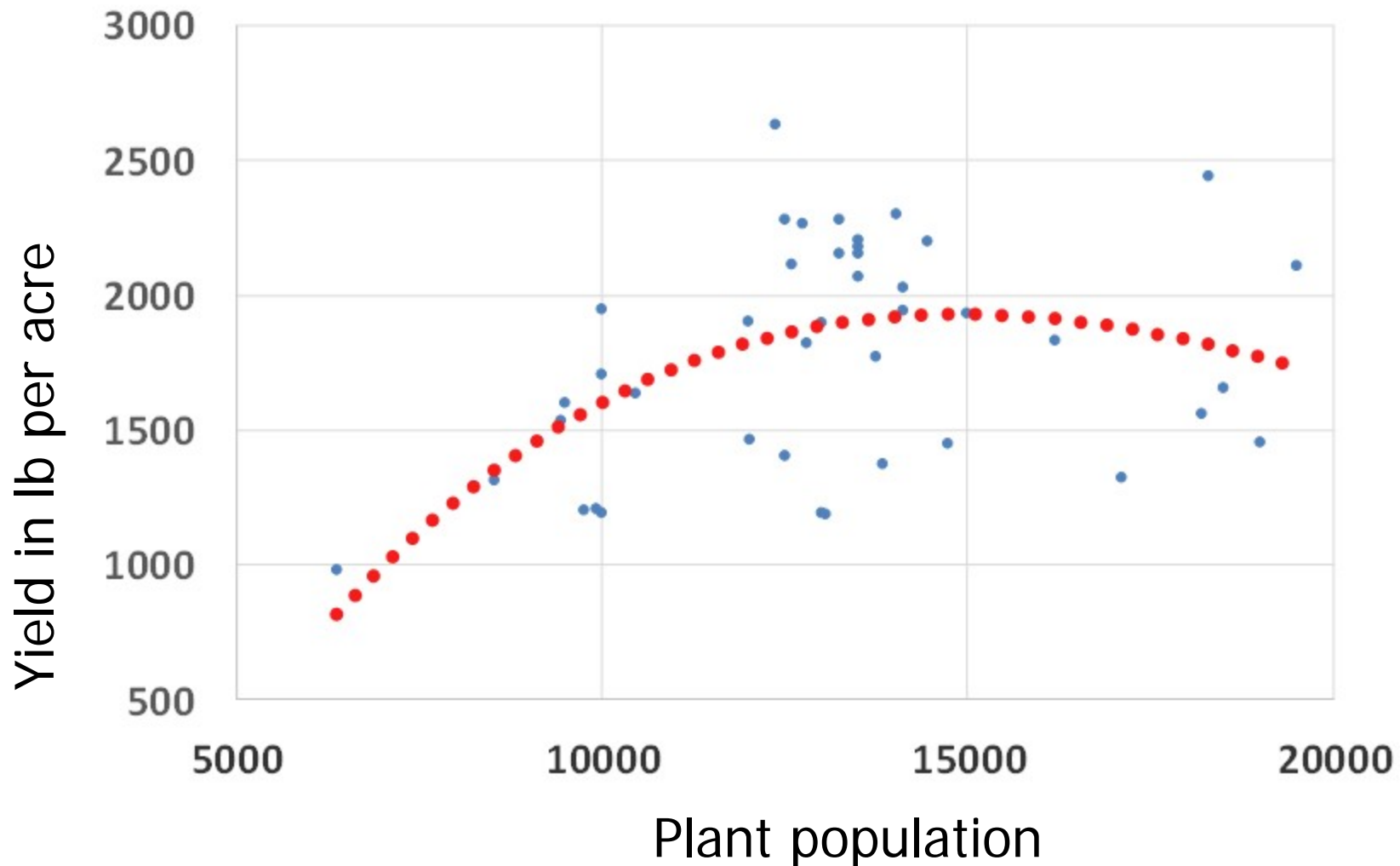
2013 oil sunflower population by yield in lb/a



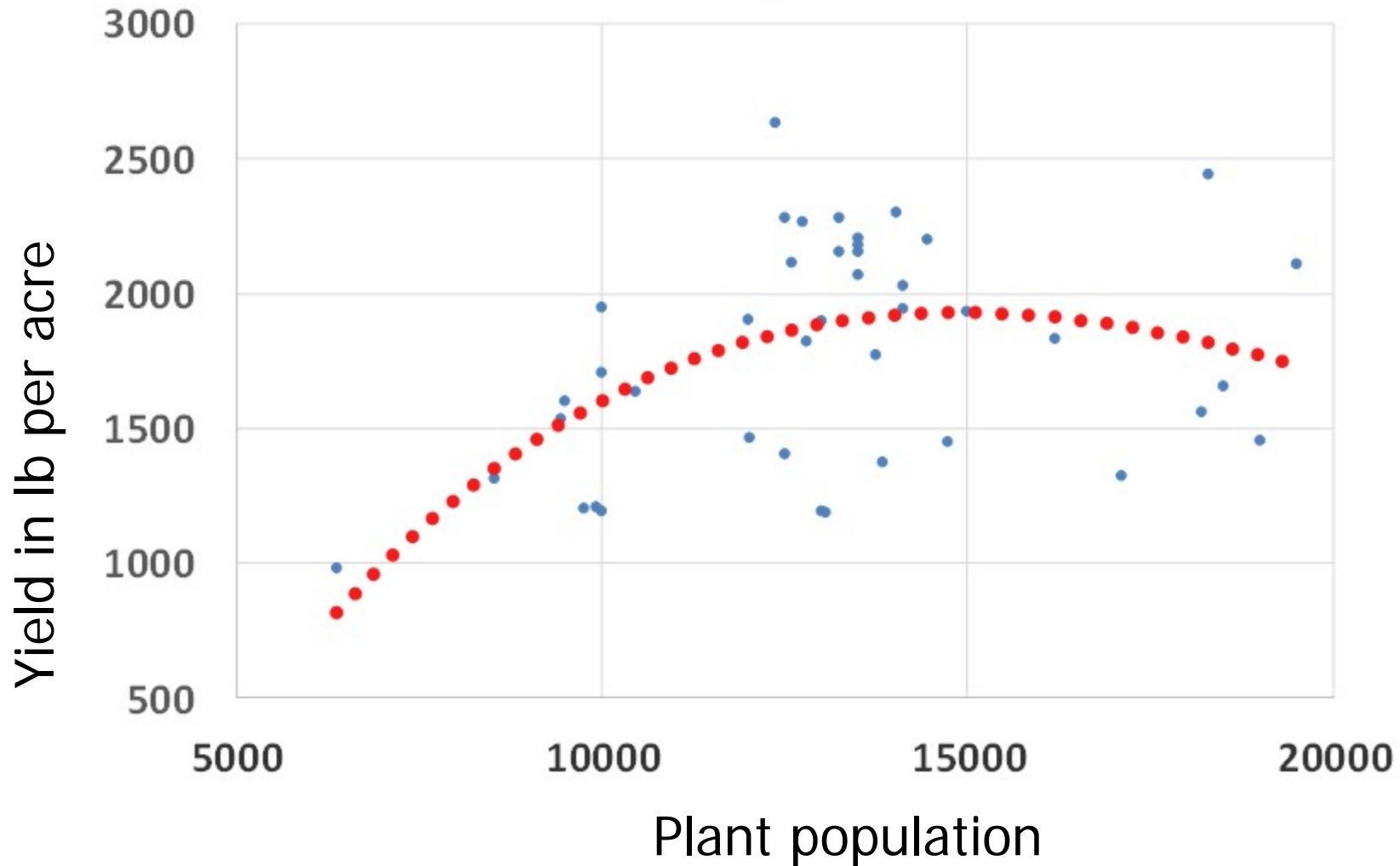
2013 oil sunflower population by yield in lb/a Average 1731



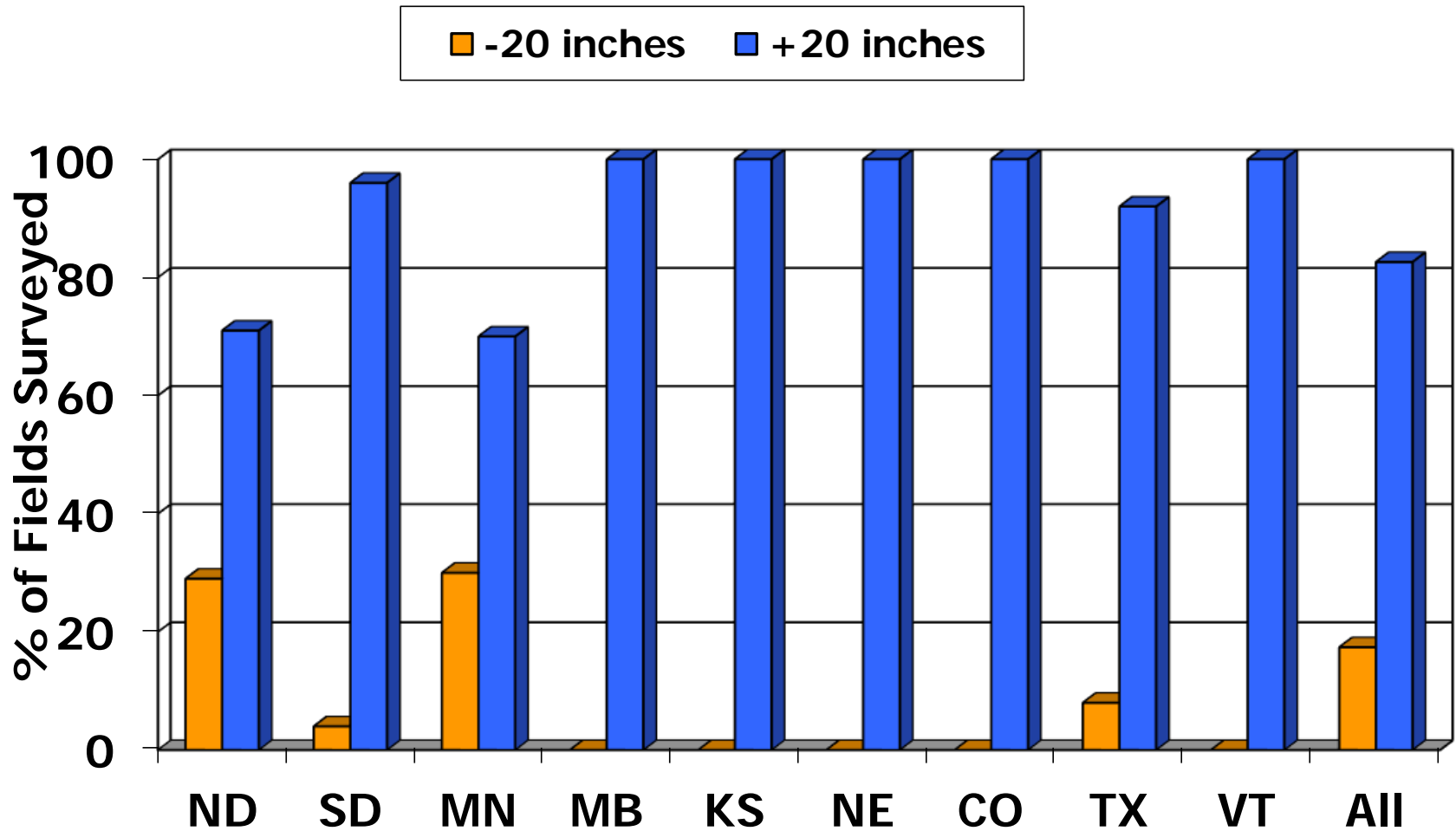
2013 confection sunflower population by yield in lb/a



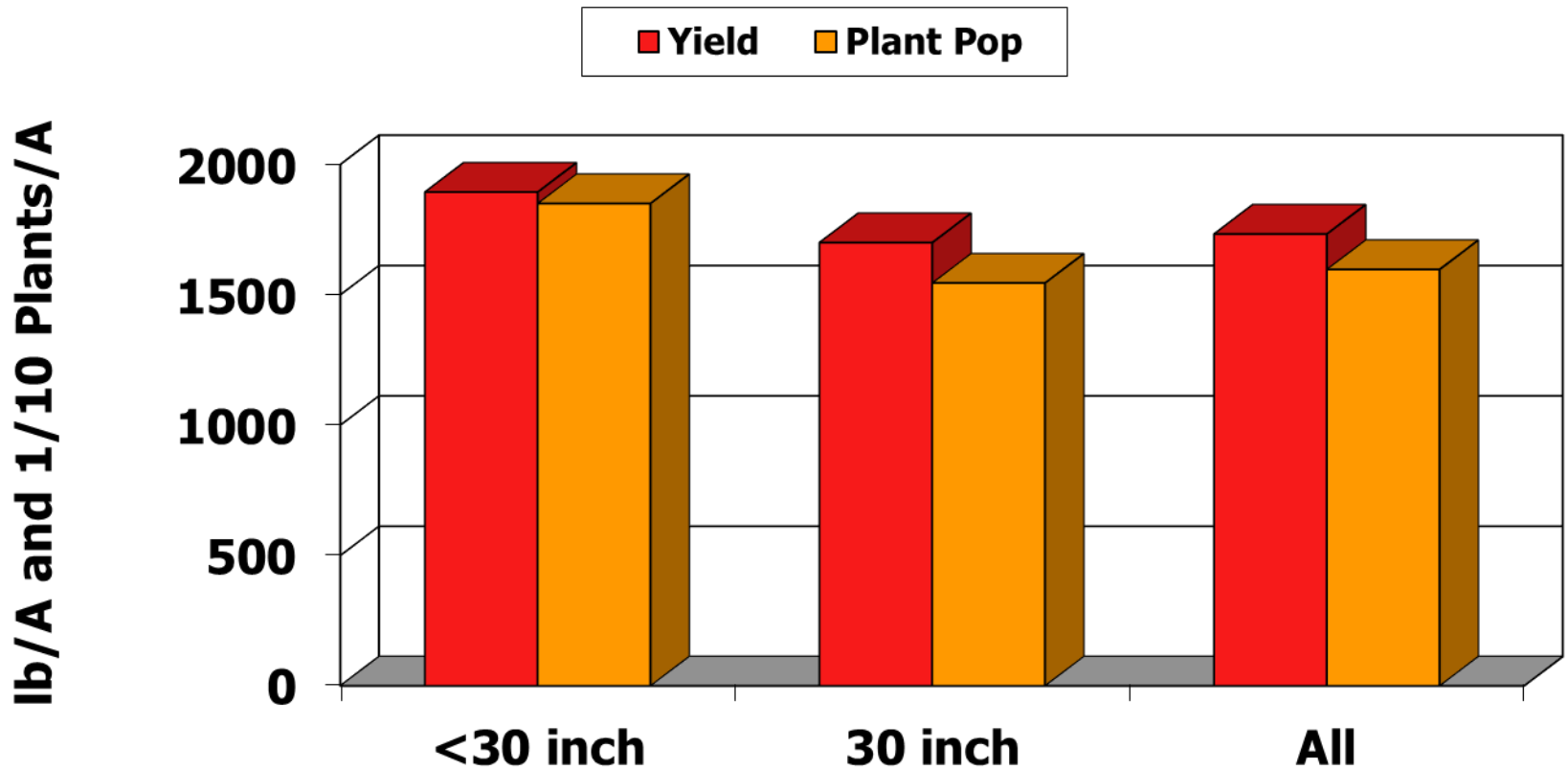
2013 confection sunflower population by yield in lb/a Average 1783



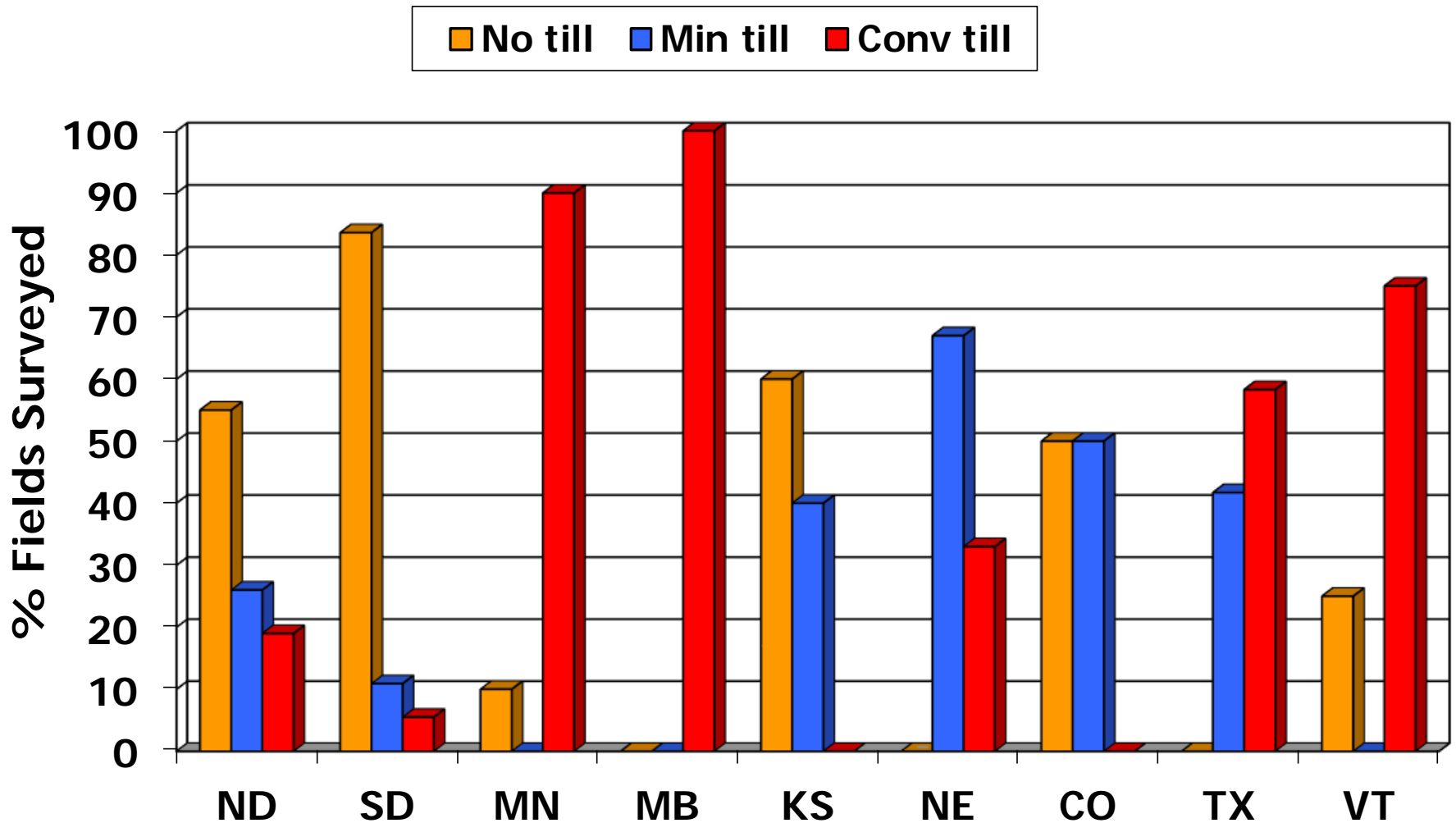
Row Spacing in Sunflower - 2013



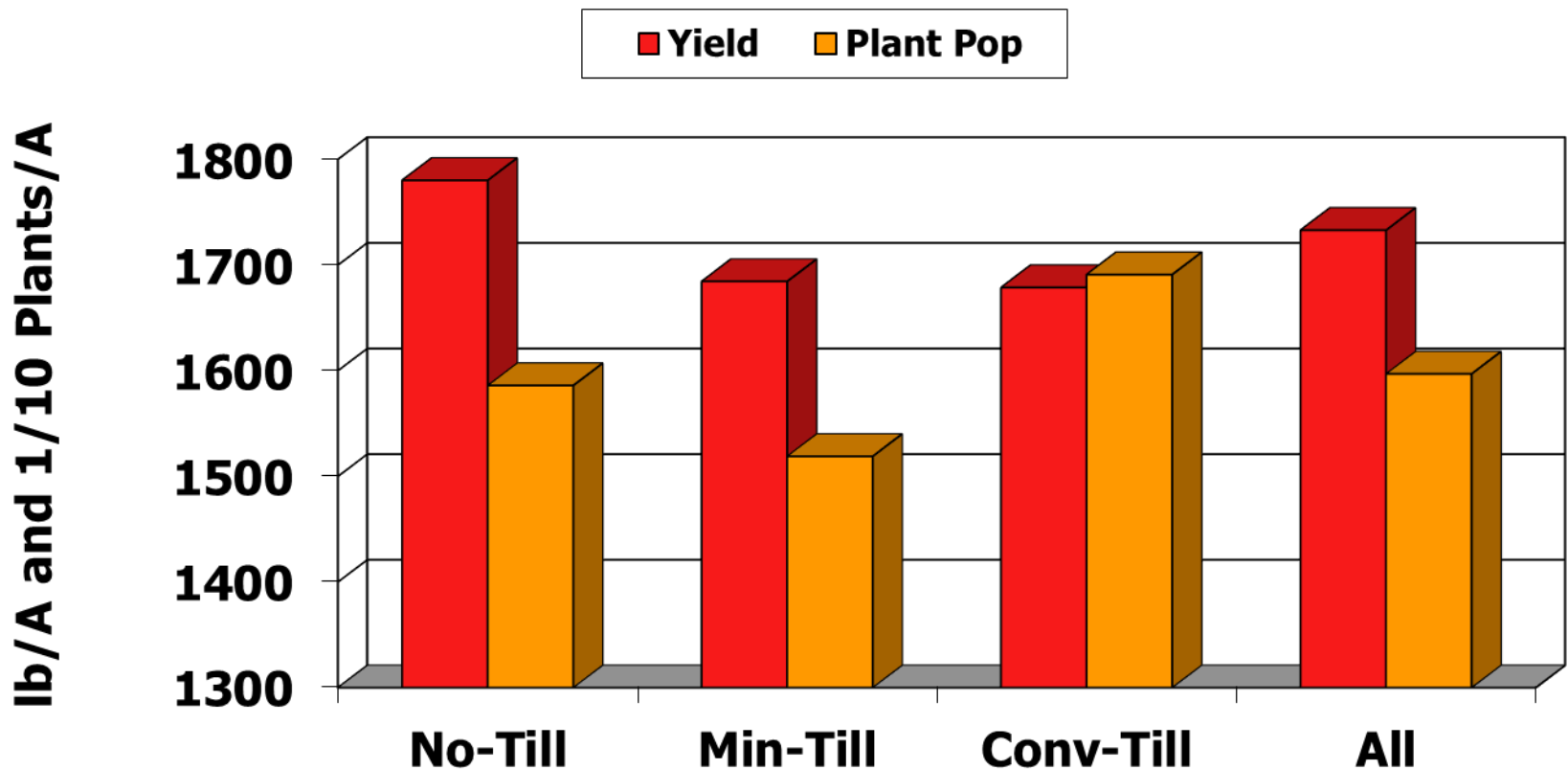
2013 Sunflower Yield and Plant Population with Rowspacing



Tillage in Sunflower - 2013



2013 Sunflower Yield and Plant Population with tillage



Rust in Sunflower



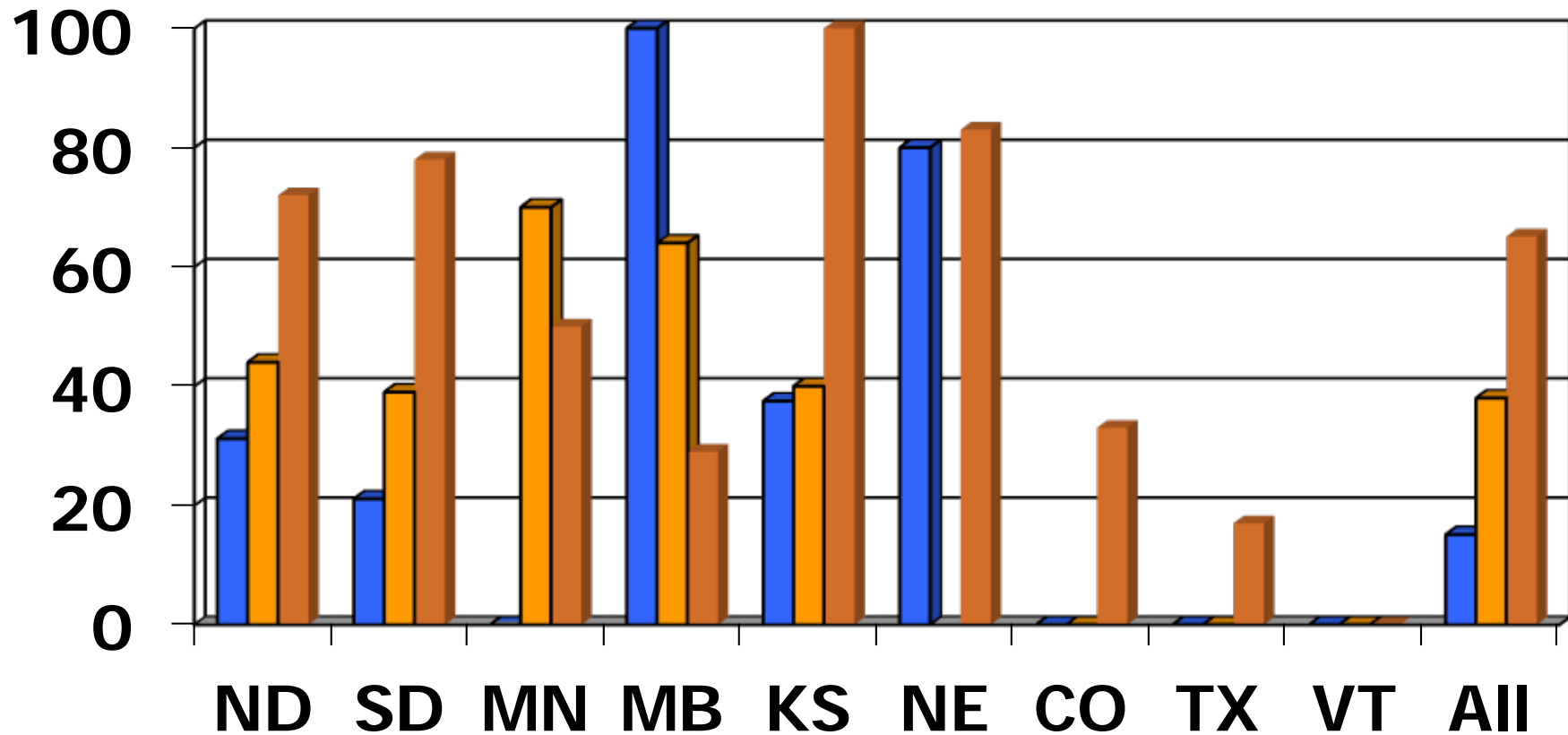
Instructions were examine upper 4 leaves on 5 consecutive plants and determine % of the leaf area covered with rust.

Red Rust Incidence in Sunflower

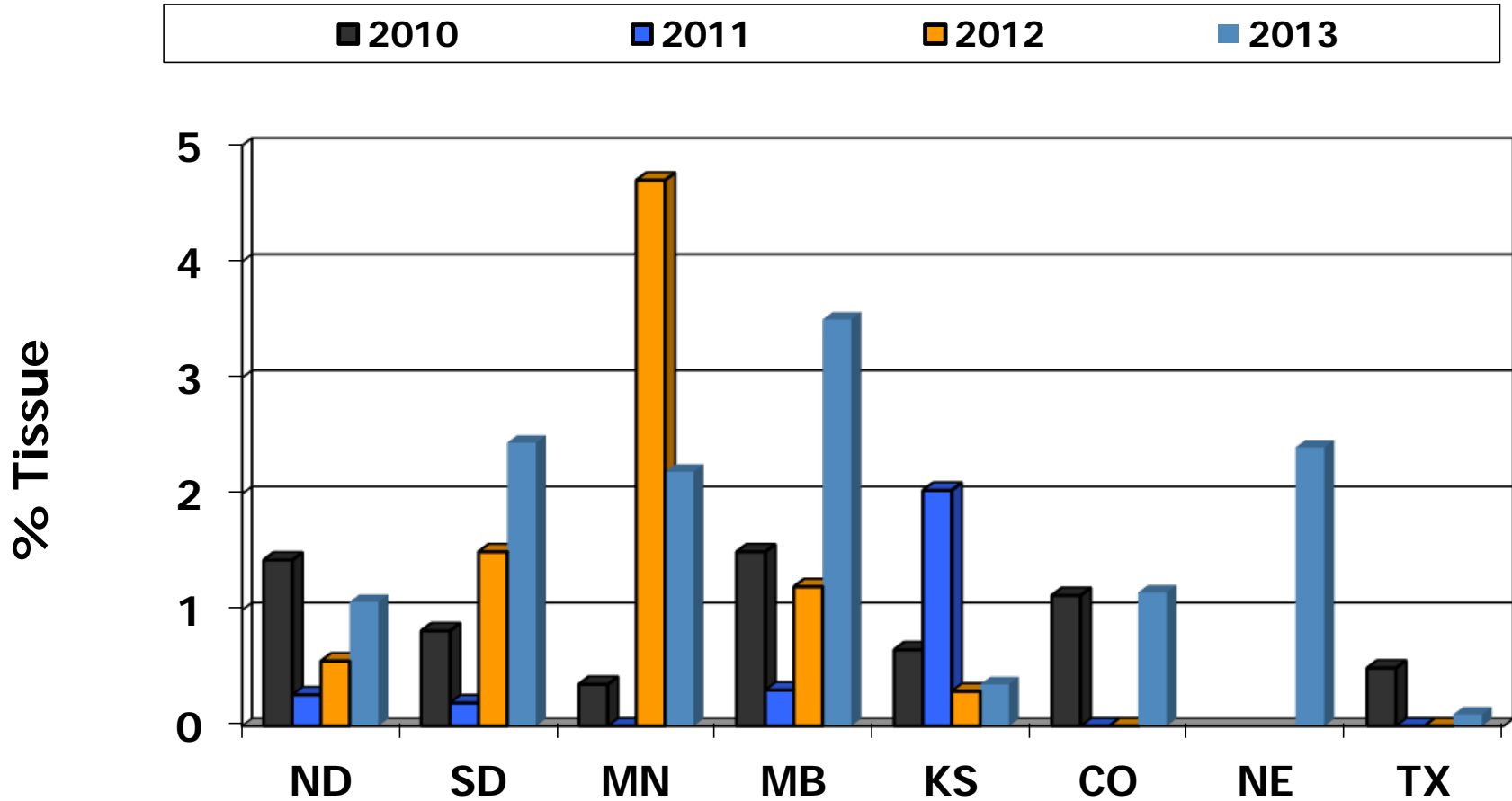
■ 2011

■ 2012

■ 2013

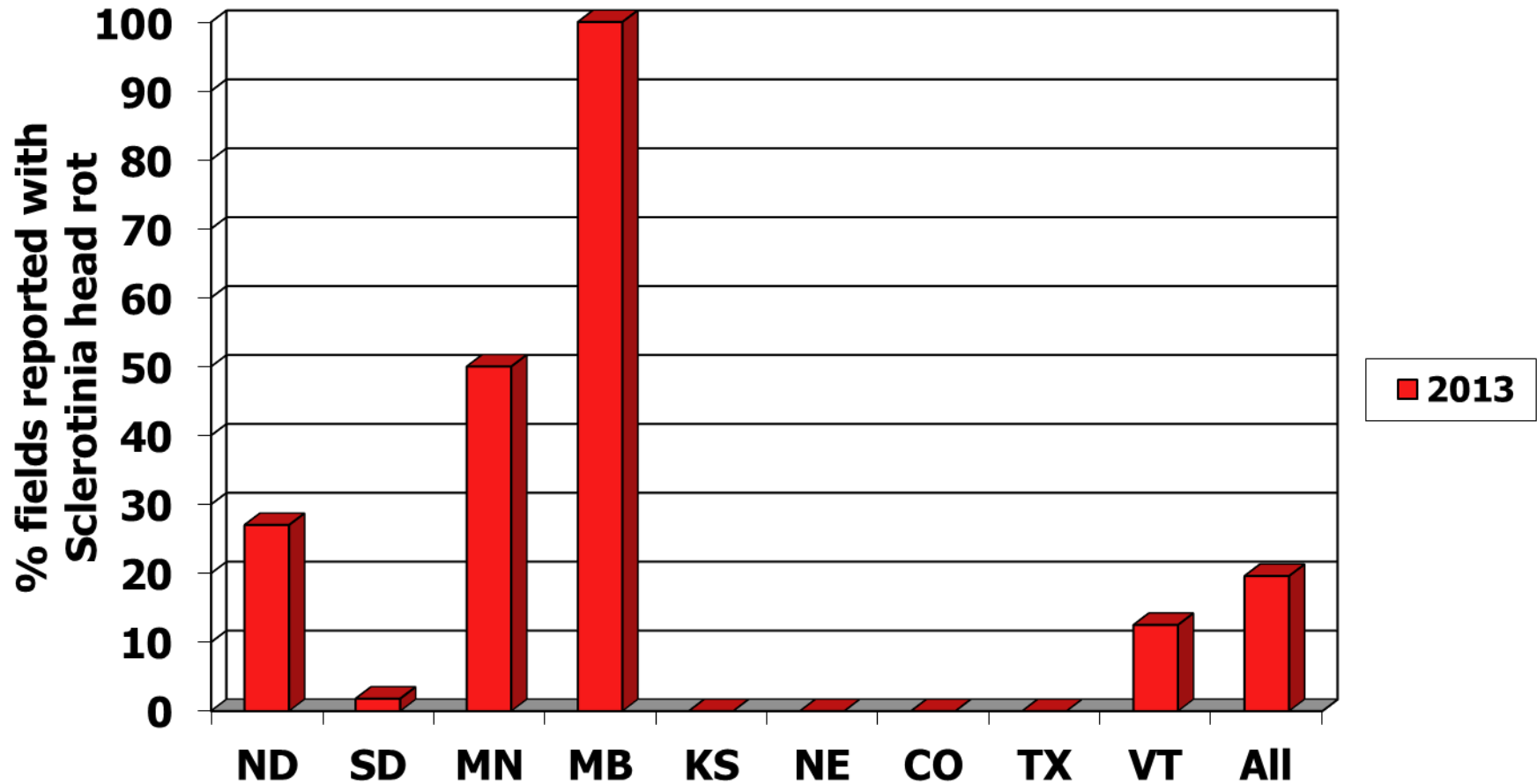


Red Rust Severity in Sunflower

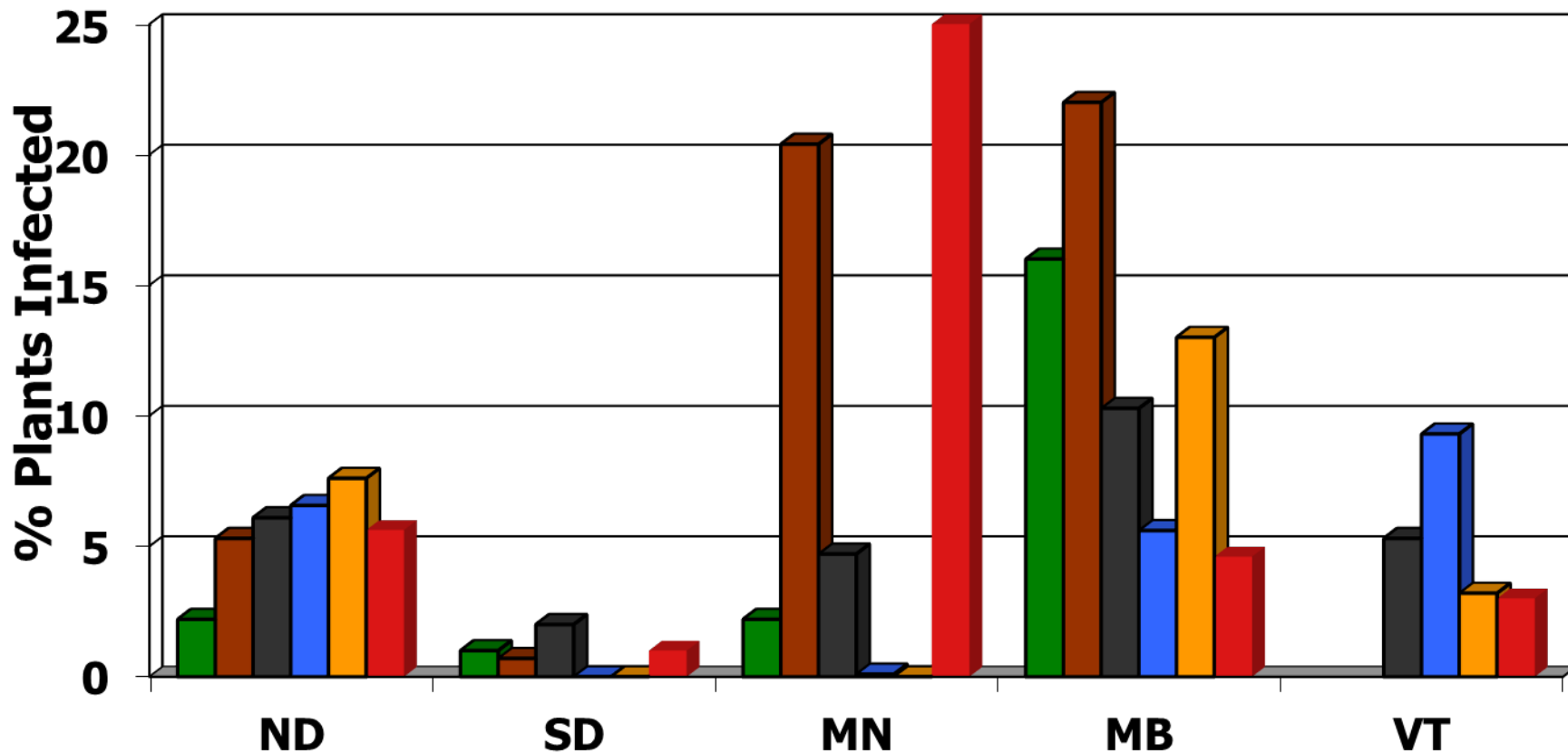


Rust Severity Estimated for Fields Where Incidence Reported

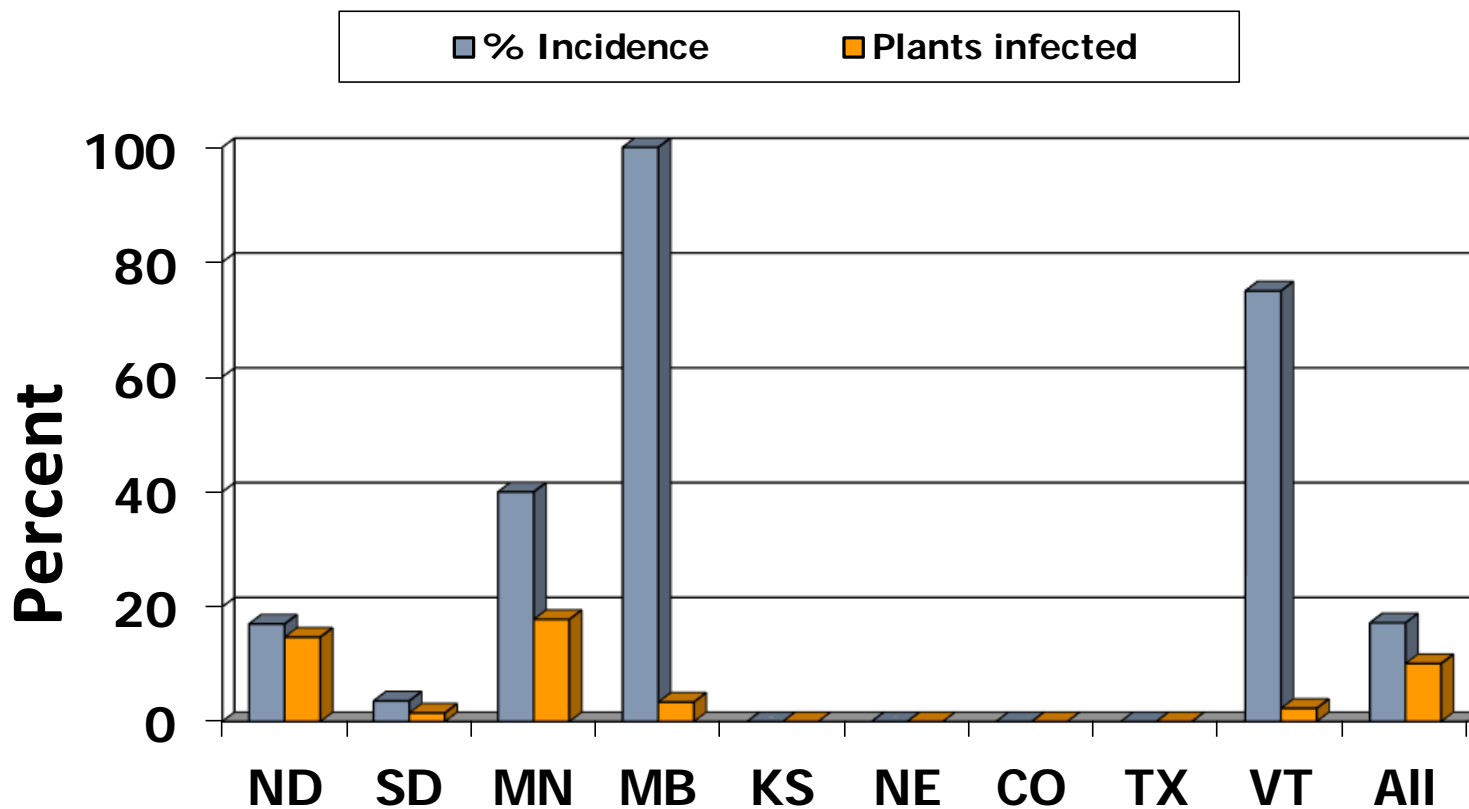
Sclerotinia Head Rot Incidence in Sunflower 2013



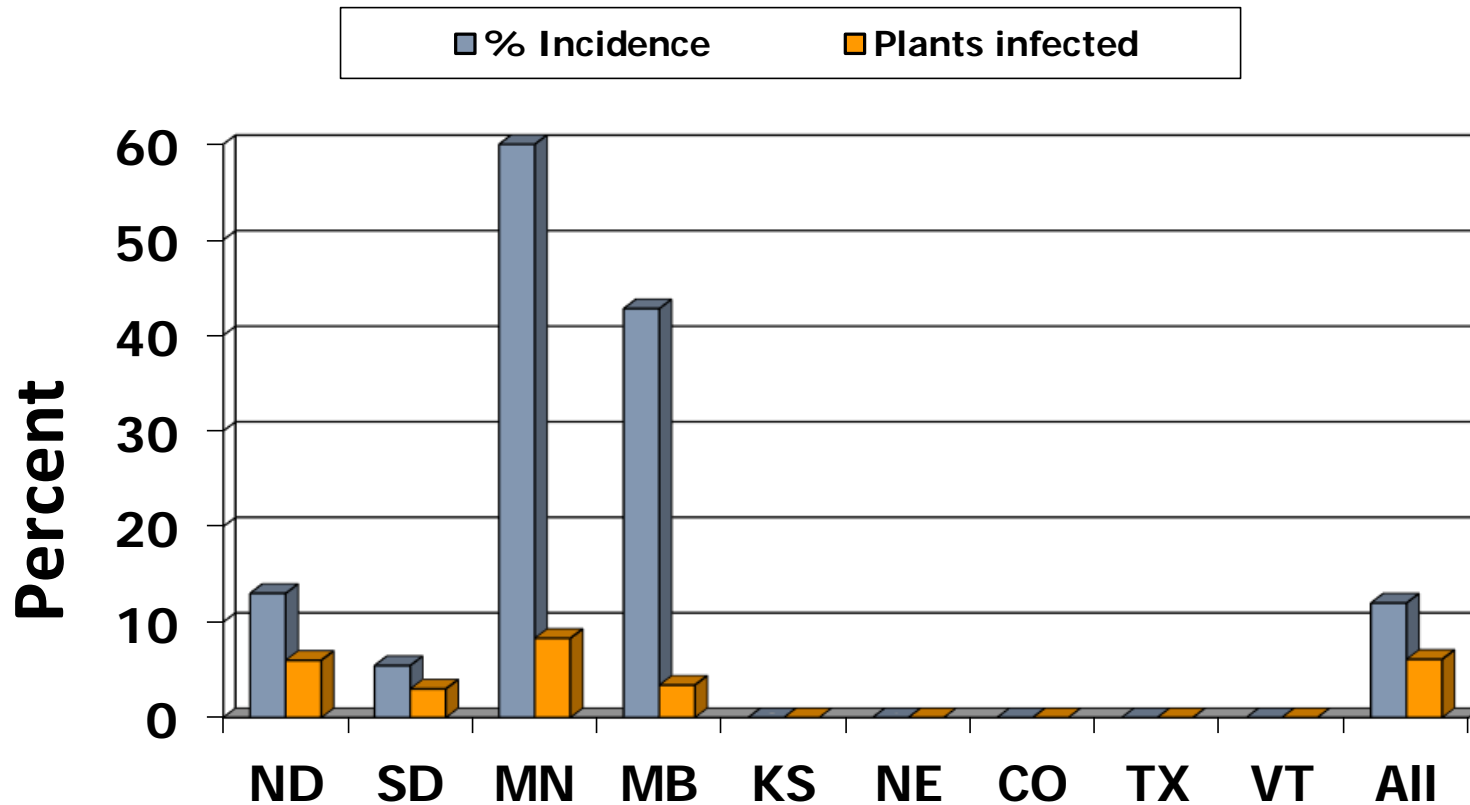
Sclerotinia Head Rot Severity in Sunflower 2008-2013



Sclerotinia Stalk Rot Incidence and Severity in Sunflower 2013



Sclerotinia Wilt Incidence and Severity in Sunflower 2013

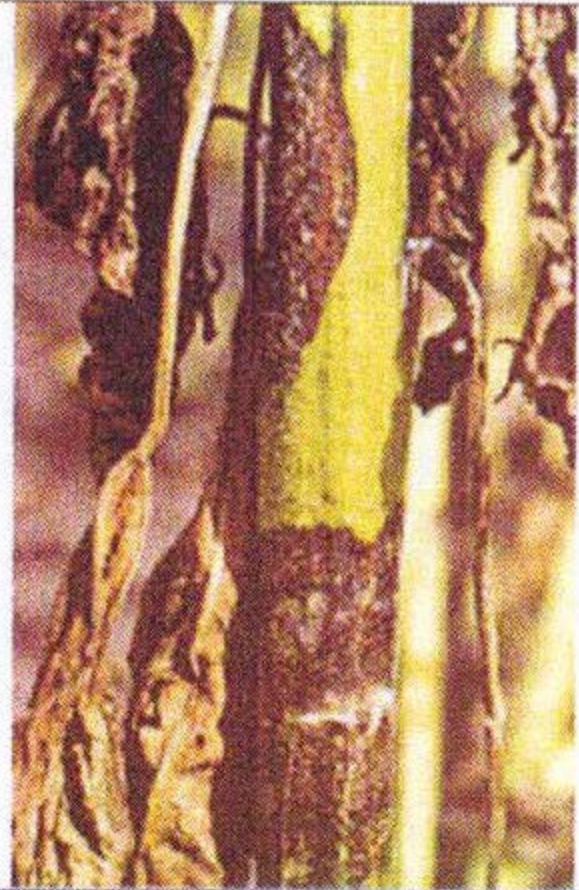




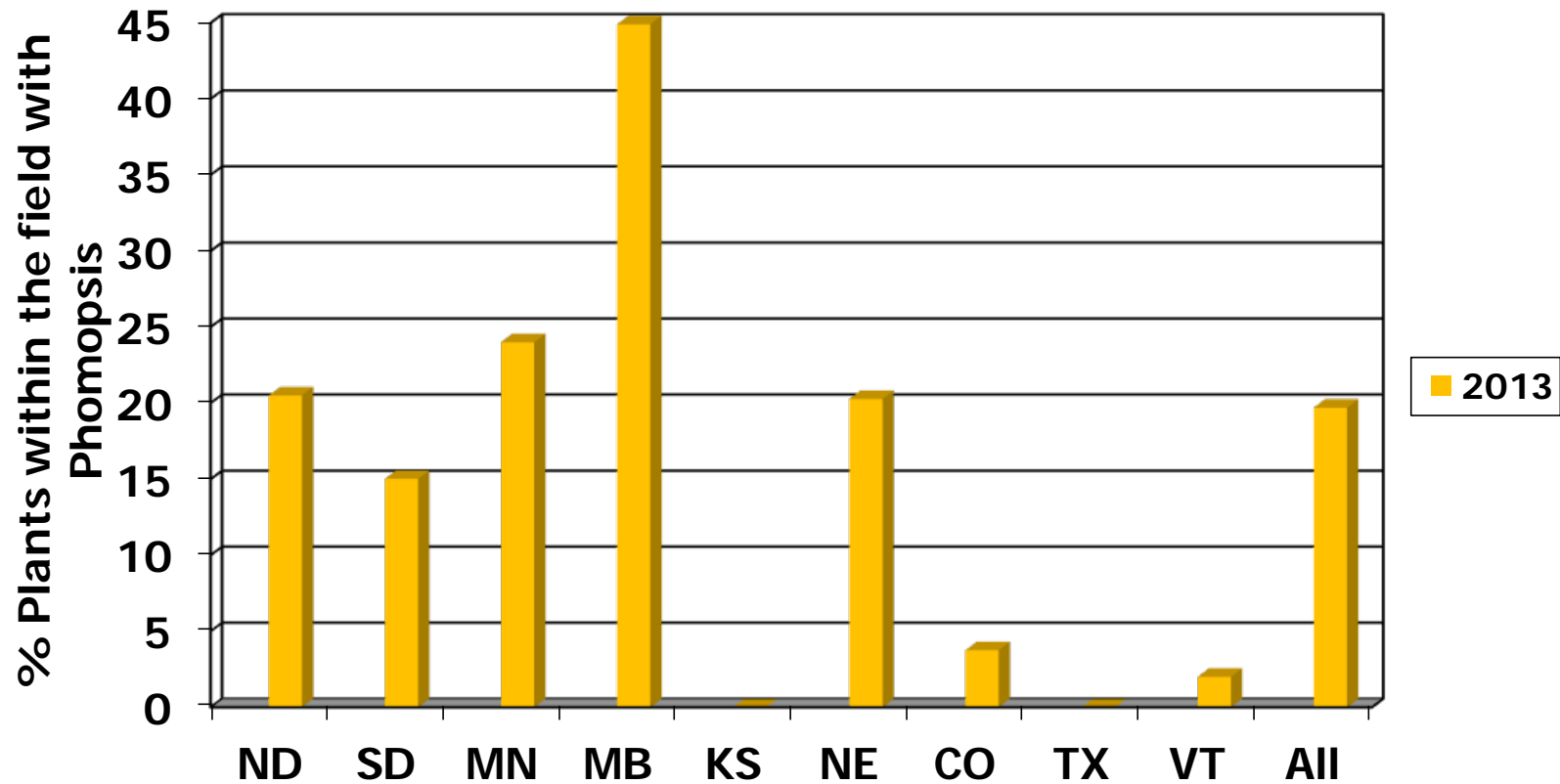
Phomopsis Stem Canker



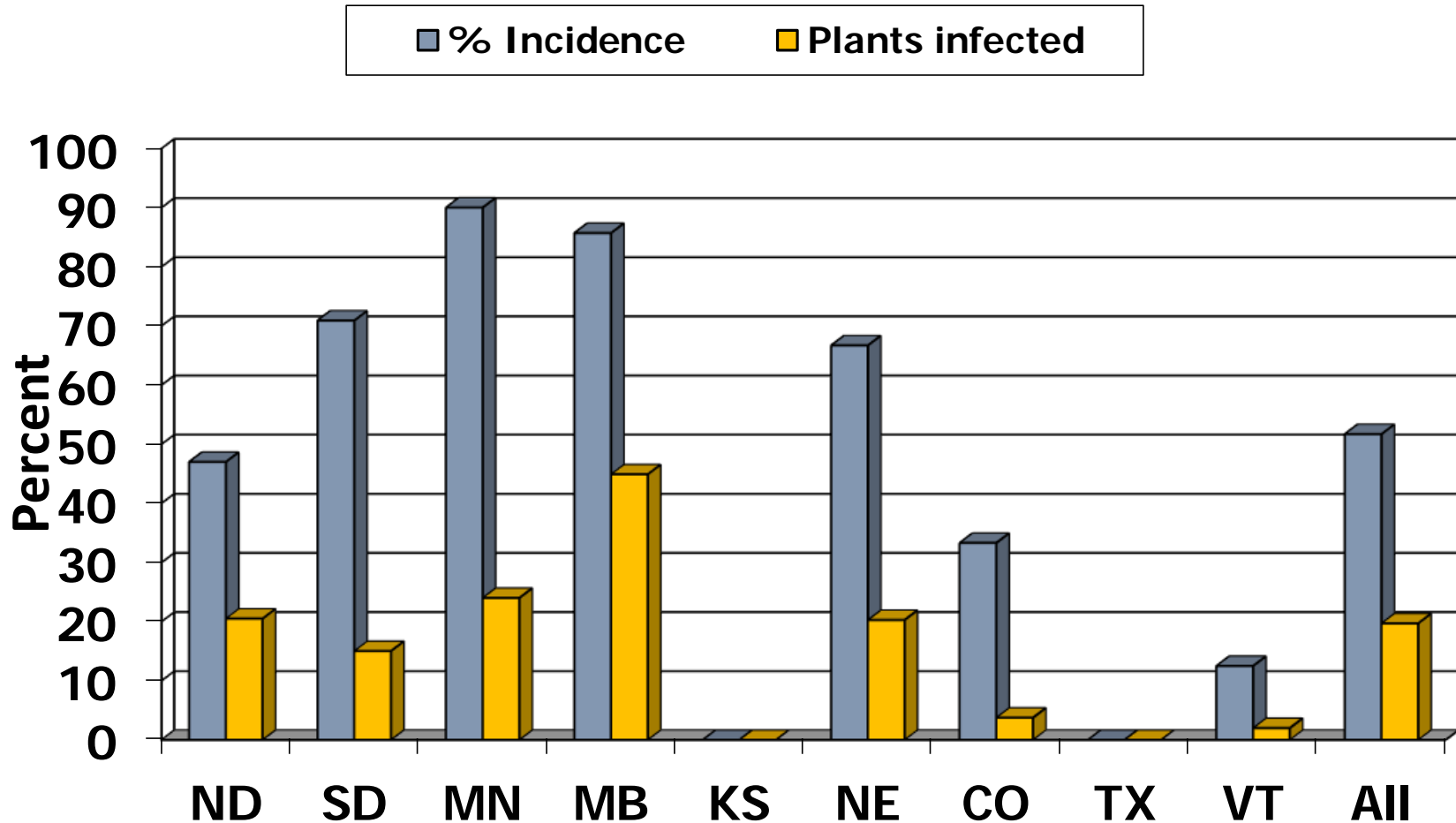
Phoma



Phomopsis Severity in Sunflower 2013

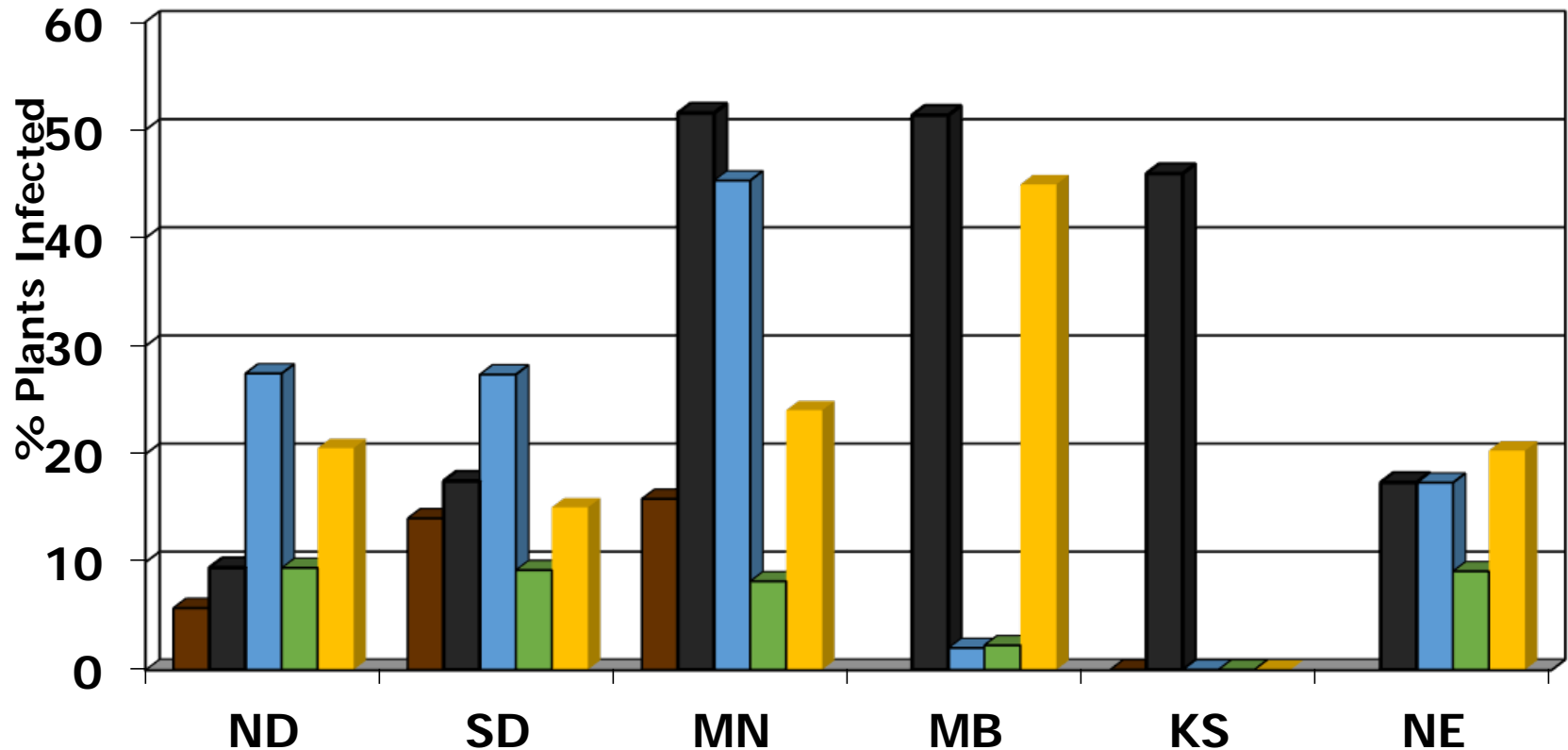


Phomopsis Incidence and Severity in Sunflower 2013



Phomopsis Severity in Sunflower 2009-2013

2009 2010 2011 2012 2013

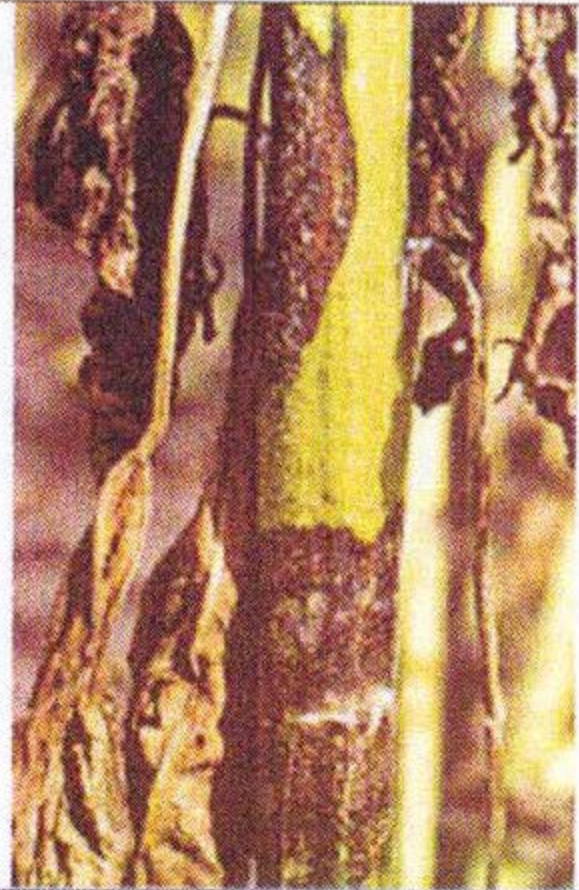




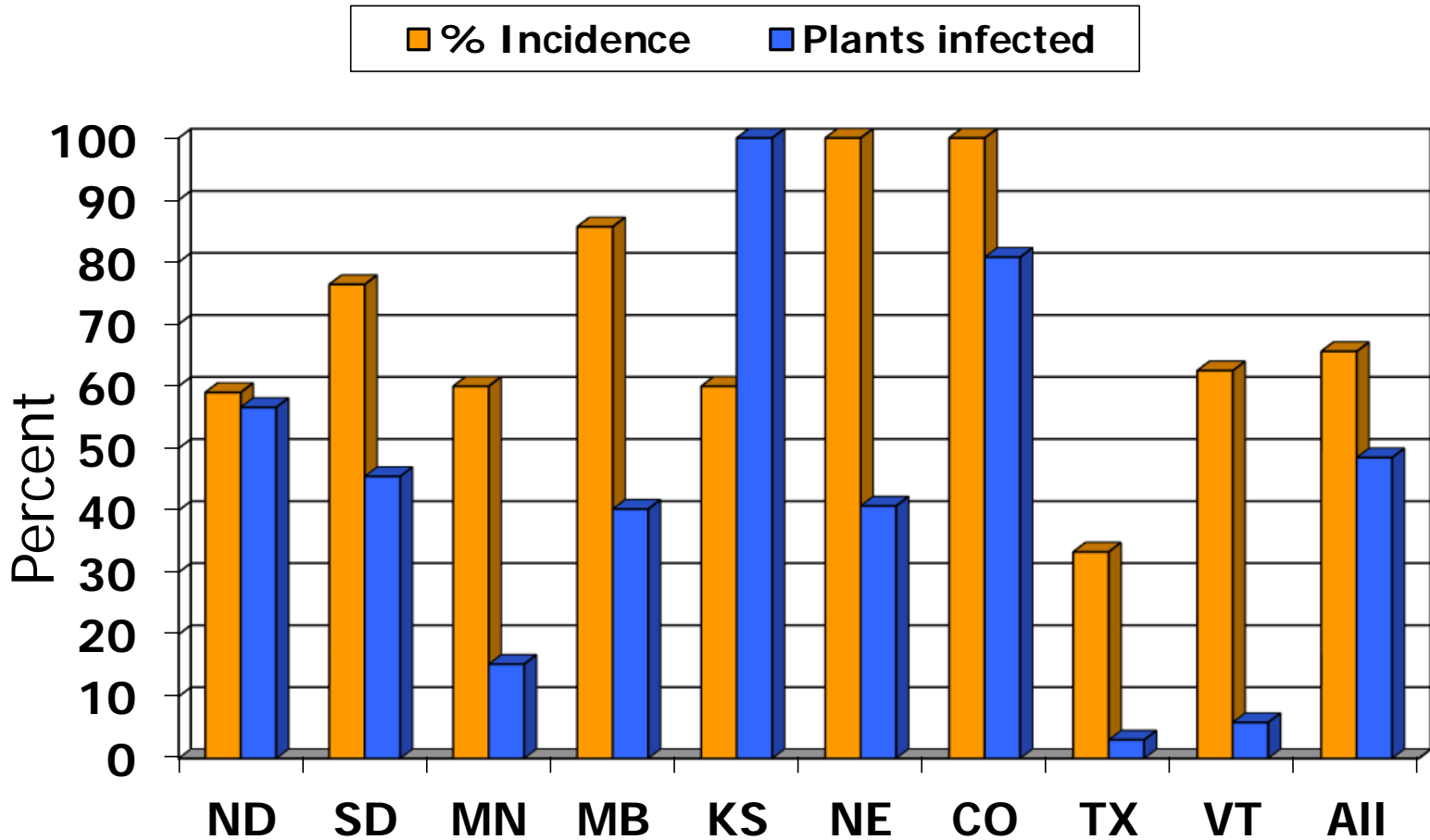
Phomopsis Stem Canker



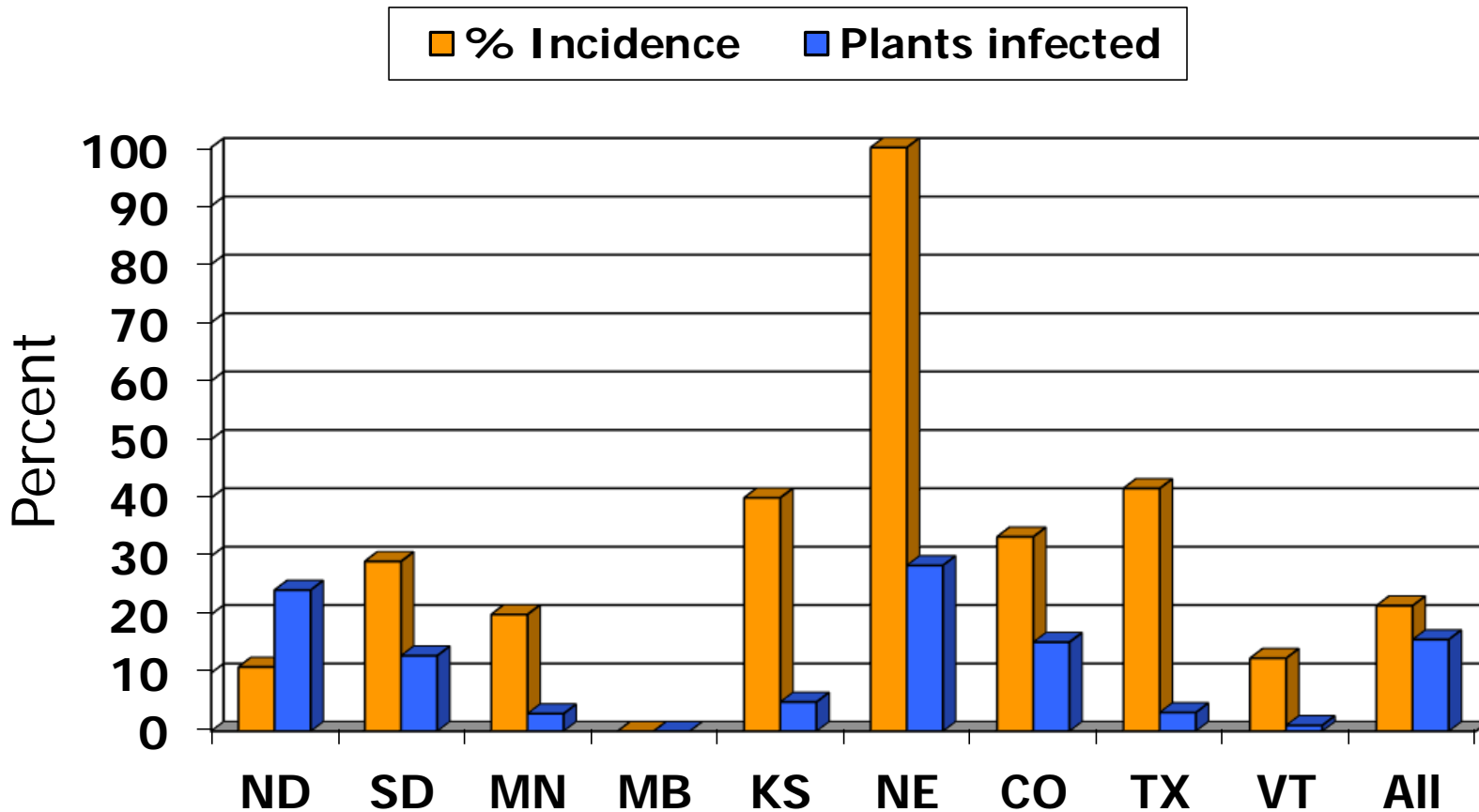
Phoma



Phoma Incidence and Severity in Sunflower 2013

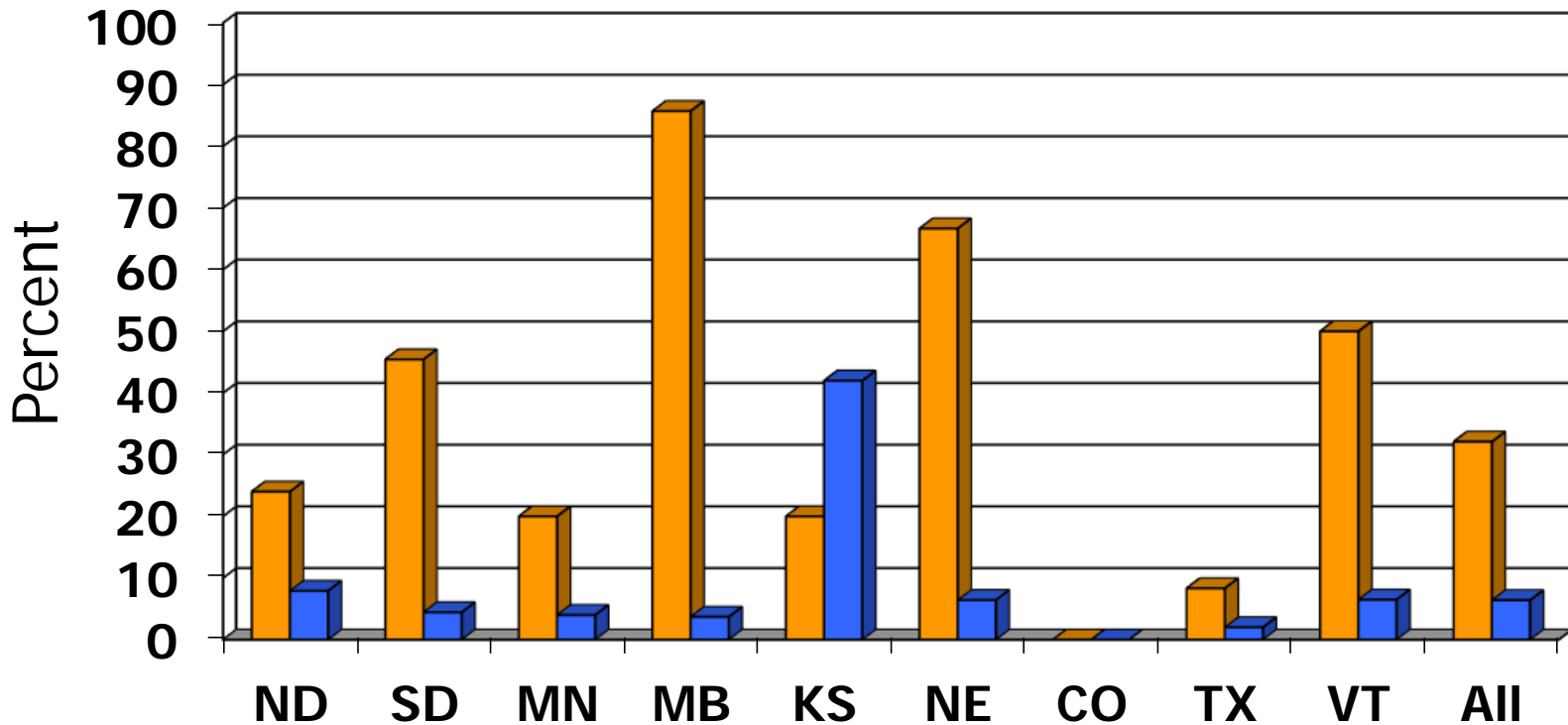


Rhizopus Incidence and Severity in Sunflower 2013



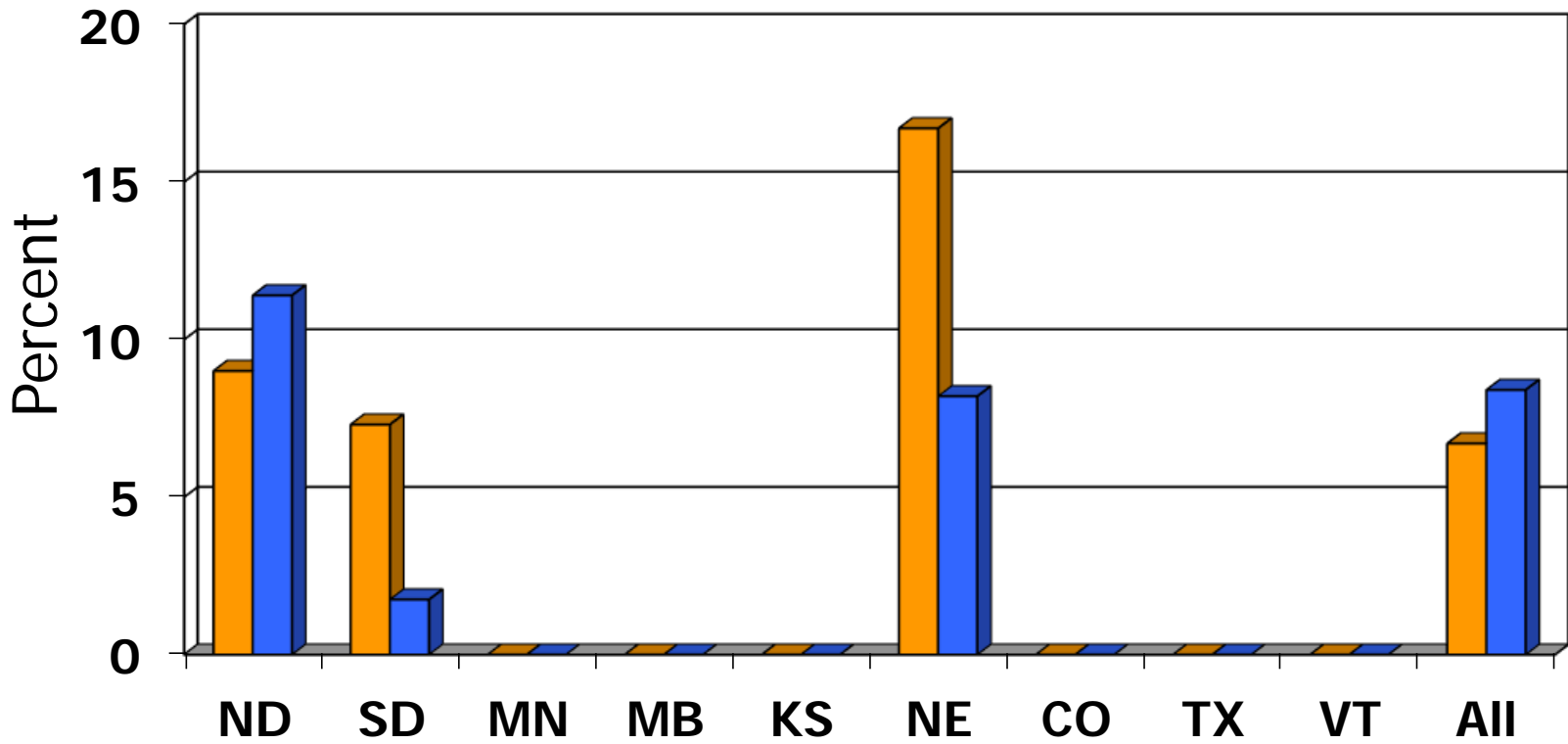
Mid Stalk Lodging Incidence and Severity in Sunflower 2013

■ % Incidence ■ Plants infected



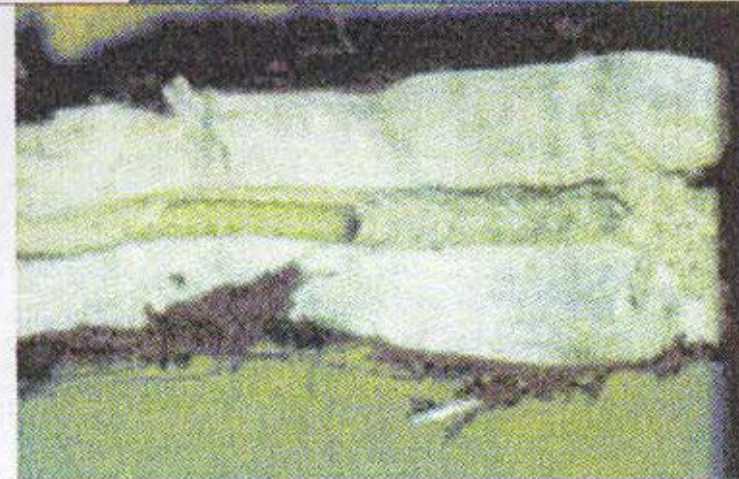
Downy Mildew Incidence and Severity in Sunflower 2013

■ % Incidence ■ Plants infected

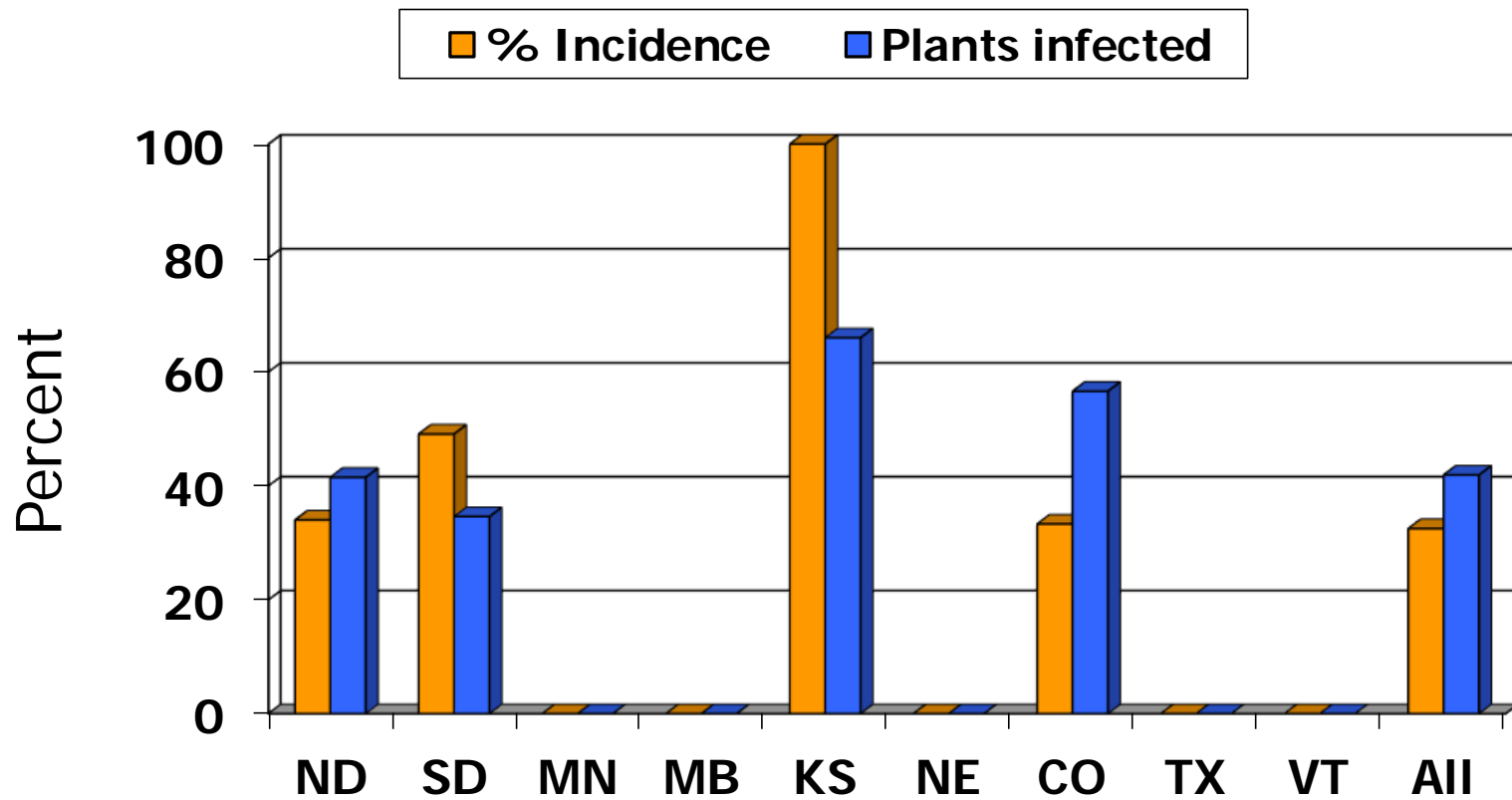


Long-horned Beetle (Dectes)

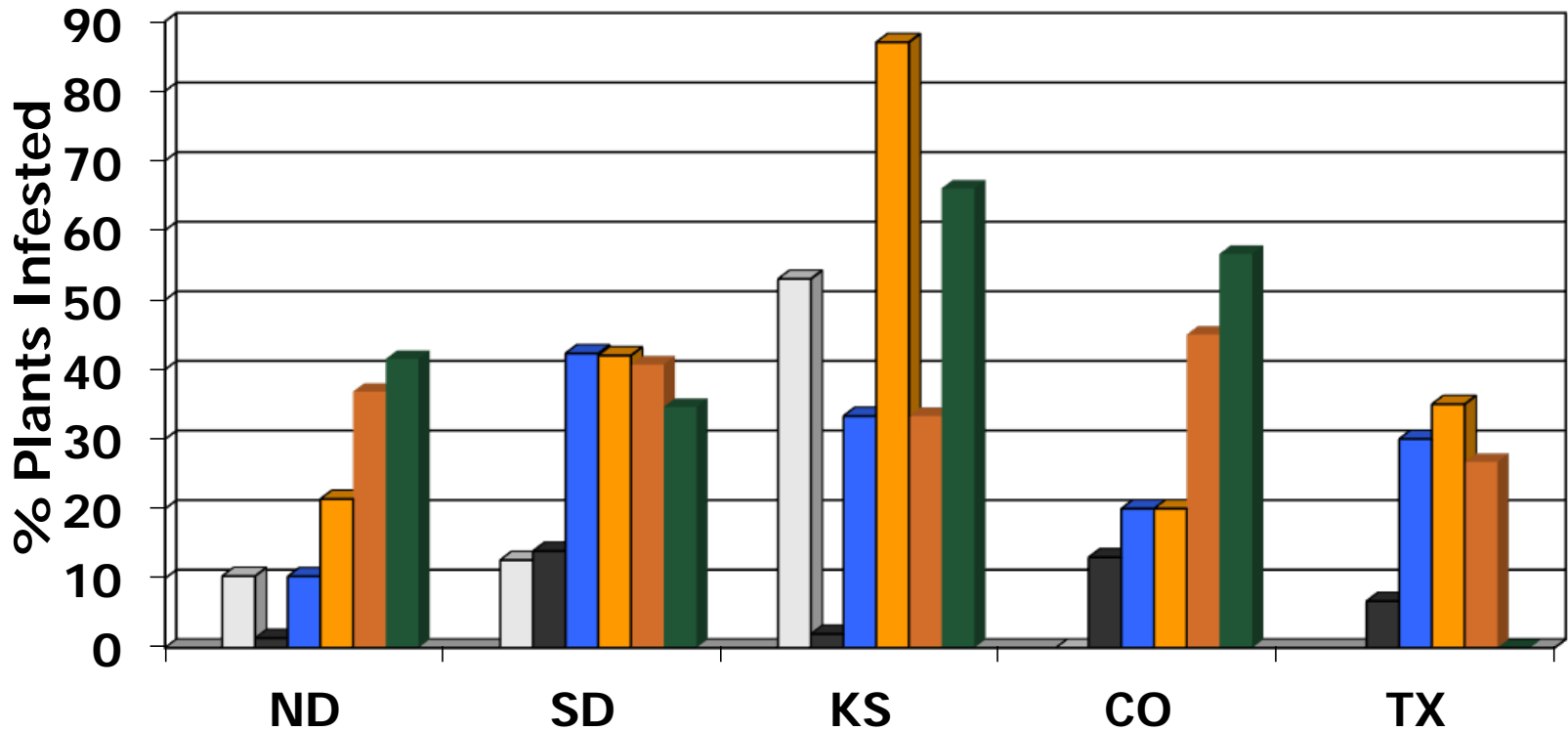
Dectes (Long-horned Beetle)



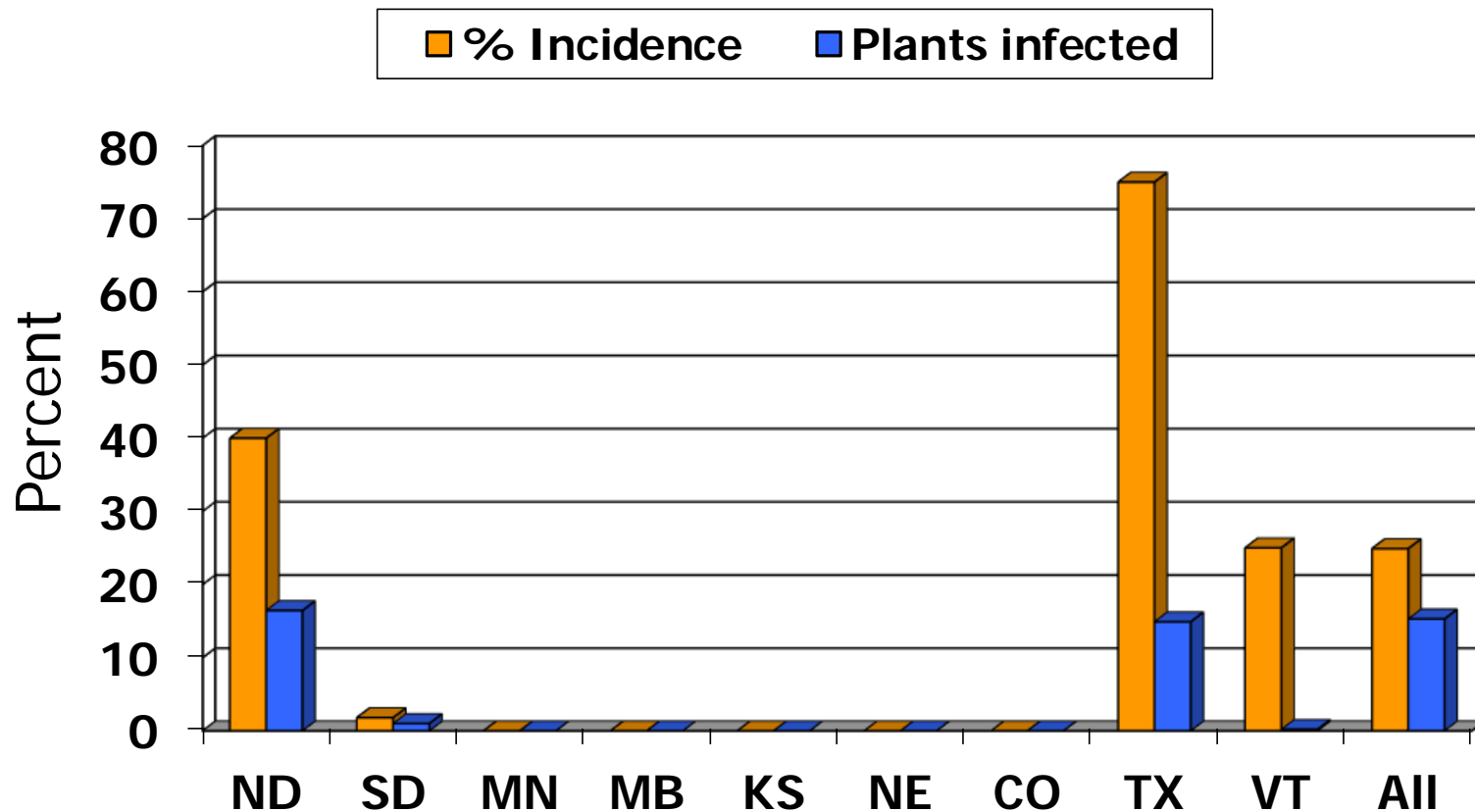
Long-horned Beetle Incidence and Severity in Sunflower 2013



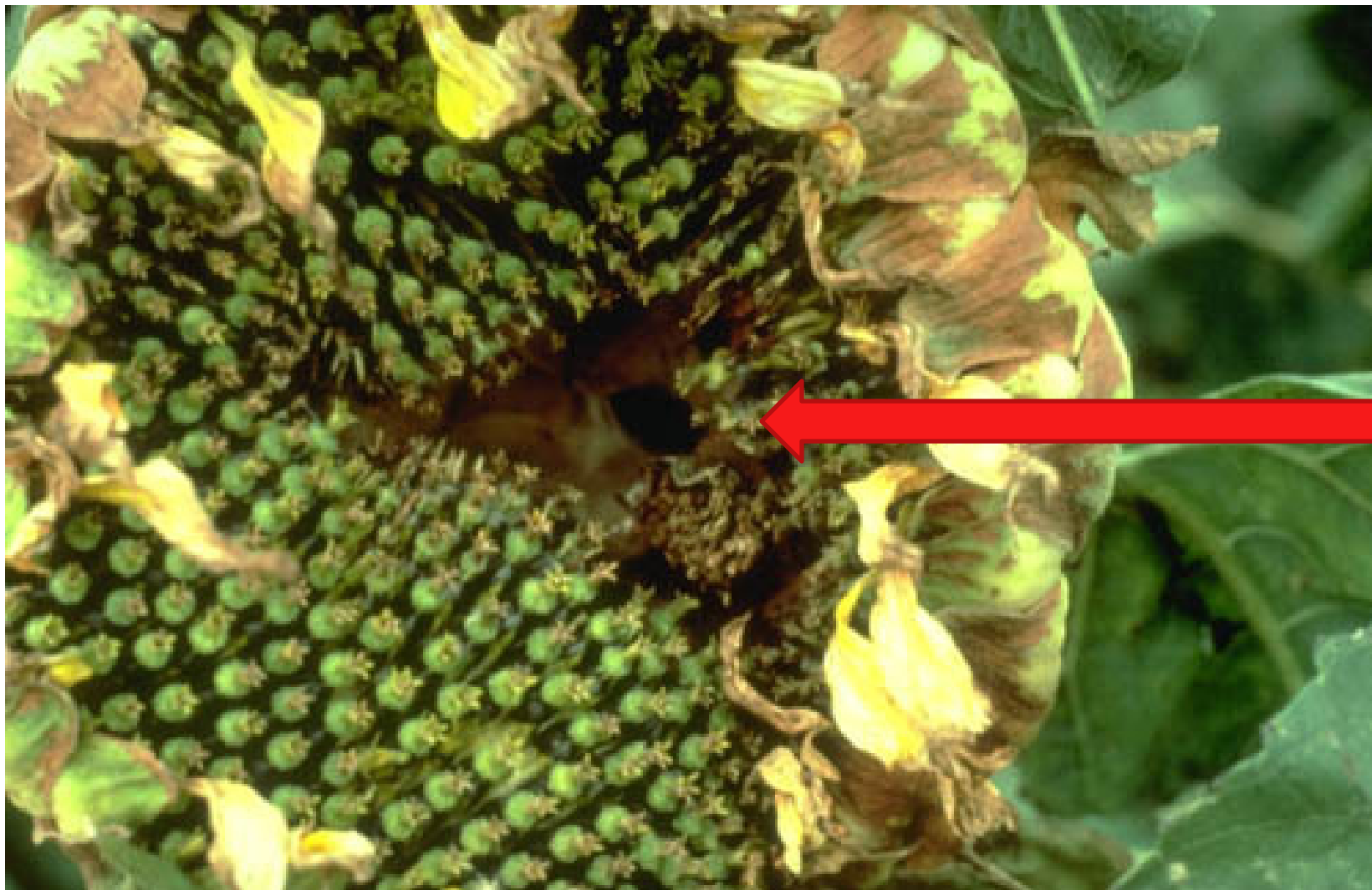
Long-horned Beetle Severity in Sunflower 2008-2013



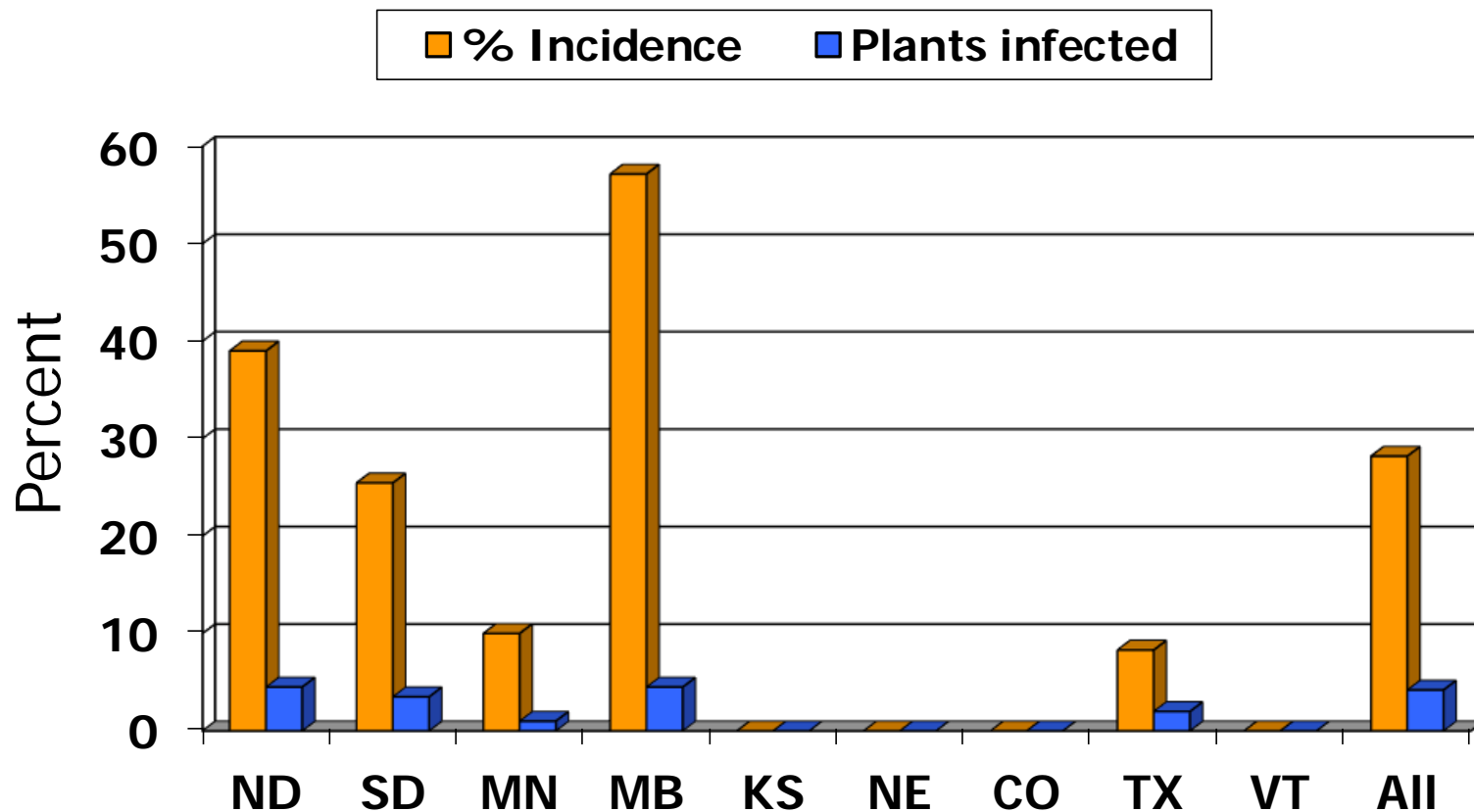
Sunflower Midge Incidence and Severity in Sunflower 2013



Bud Moth Damage in Sunflower



Sunflower Bud Moth Incidence and Severity in Sunflower 2013

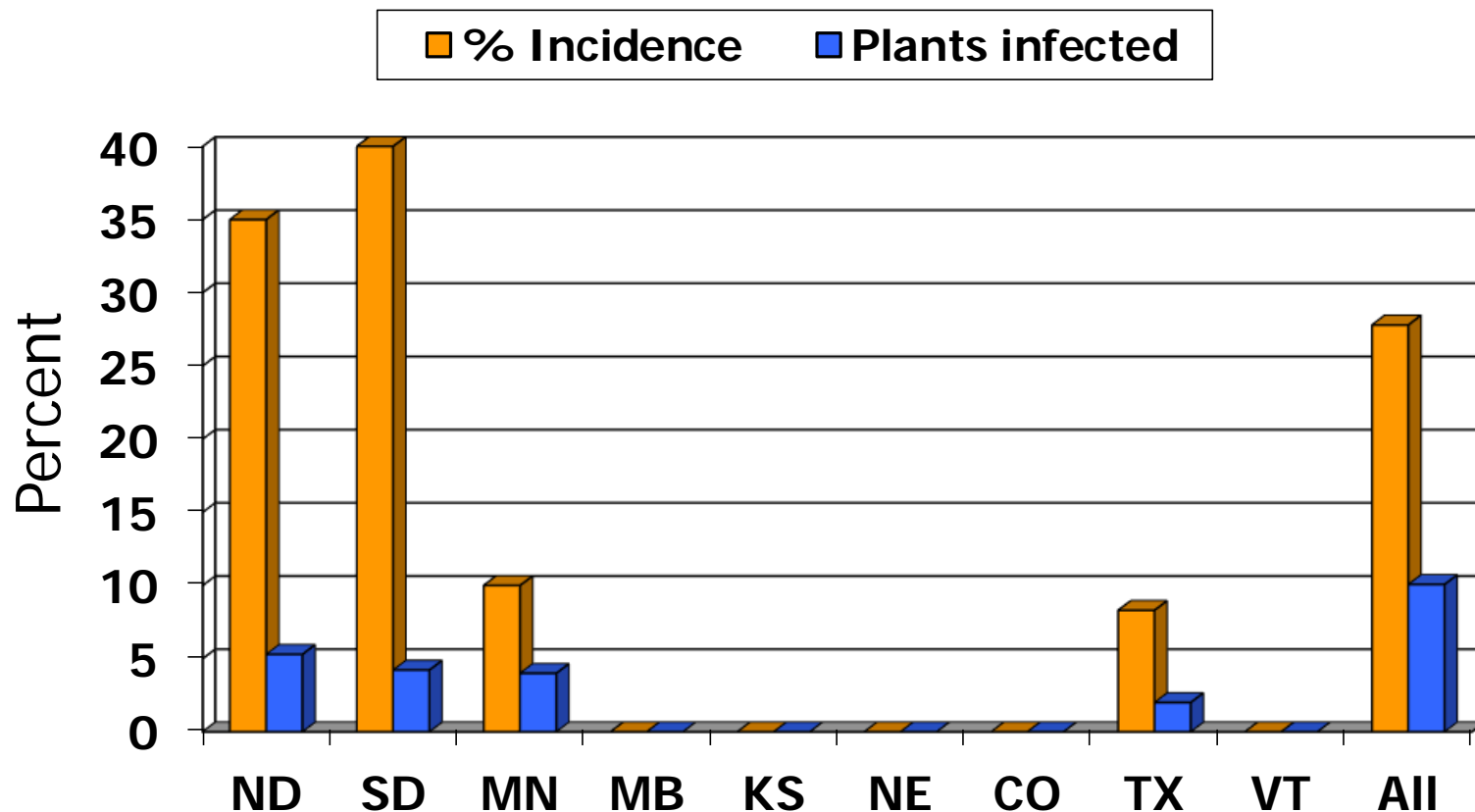


Sunflower seed maggot damage in sunflower



Photo: Dr. J. Knodel

Sunflower Seed Maggot Incidence and Severity in Sunflower 2013

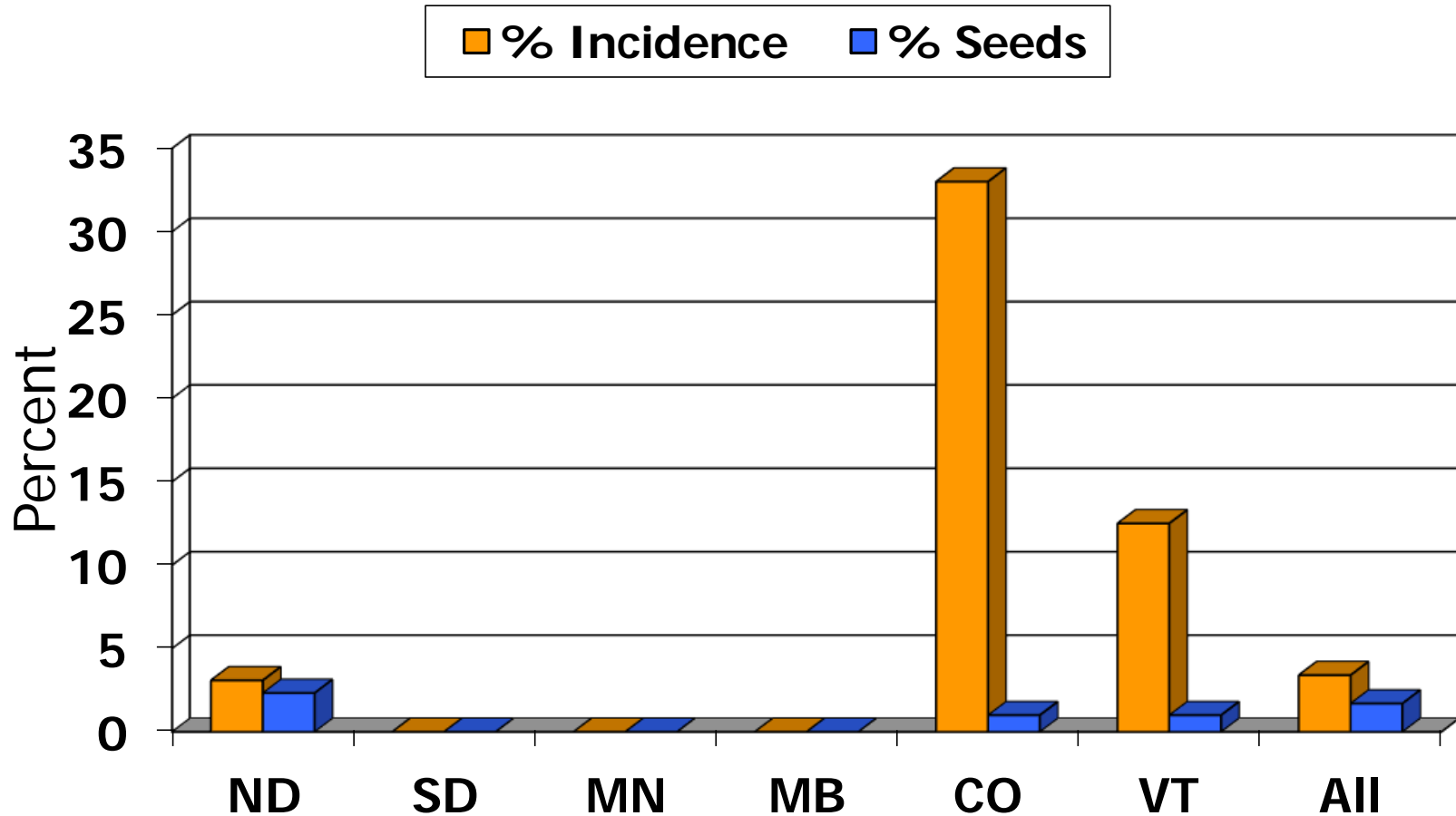




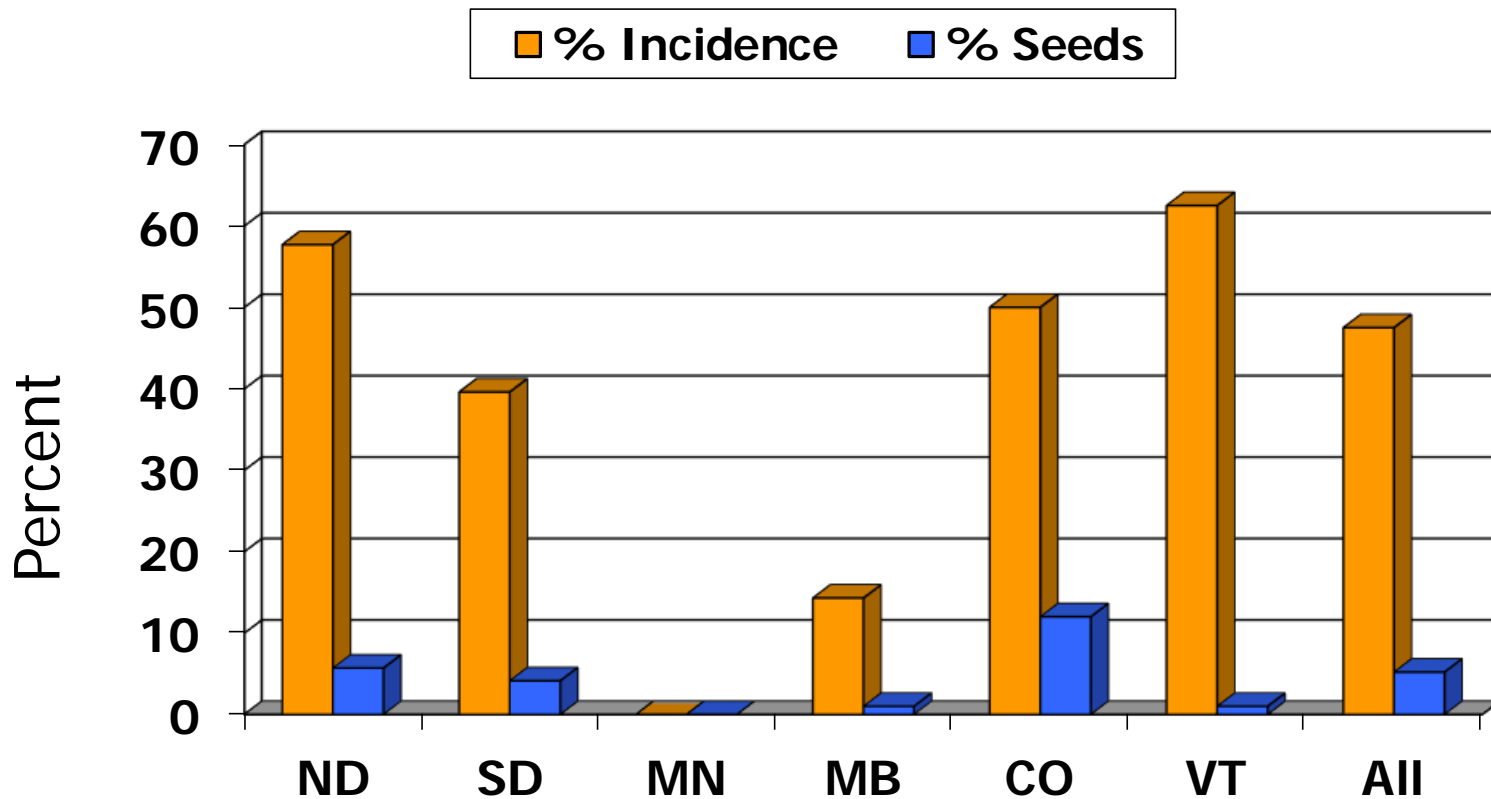
Seed sample
taken from about
5 heads per field



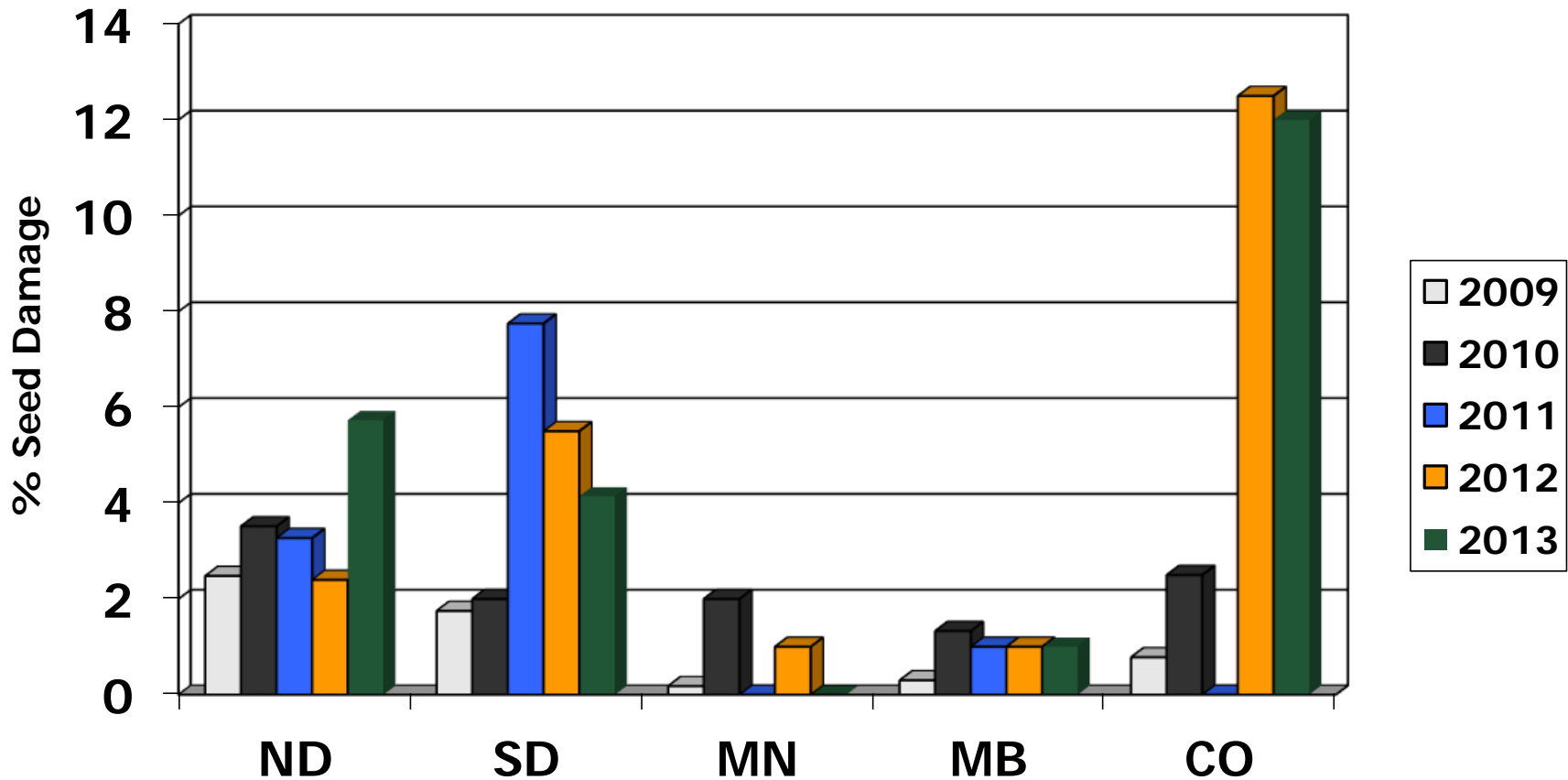
Sunflower Moth Incidence and Severity in Sunflower 2013



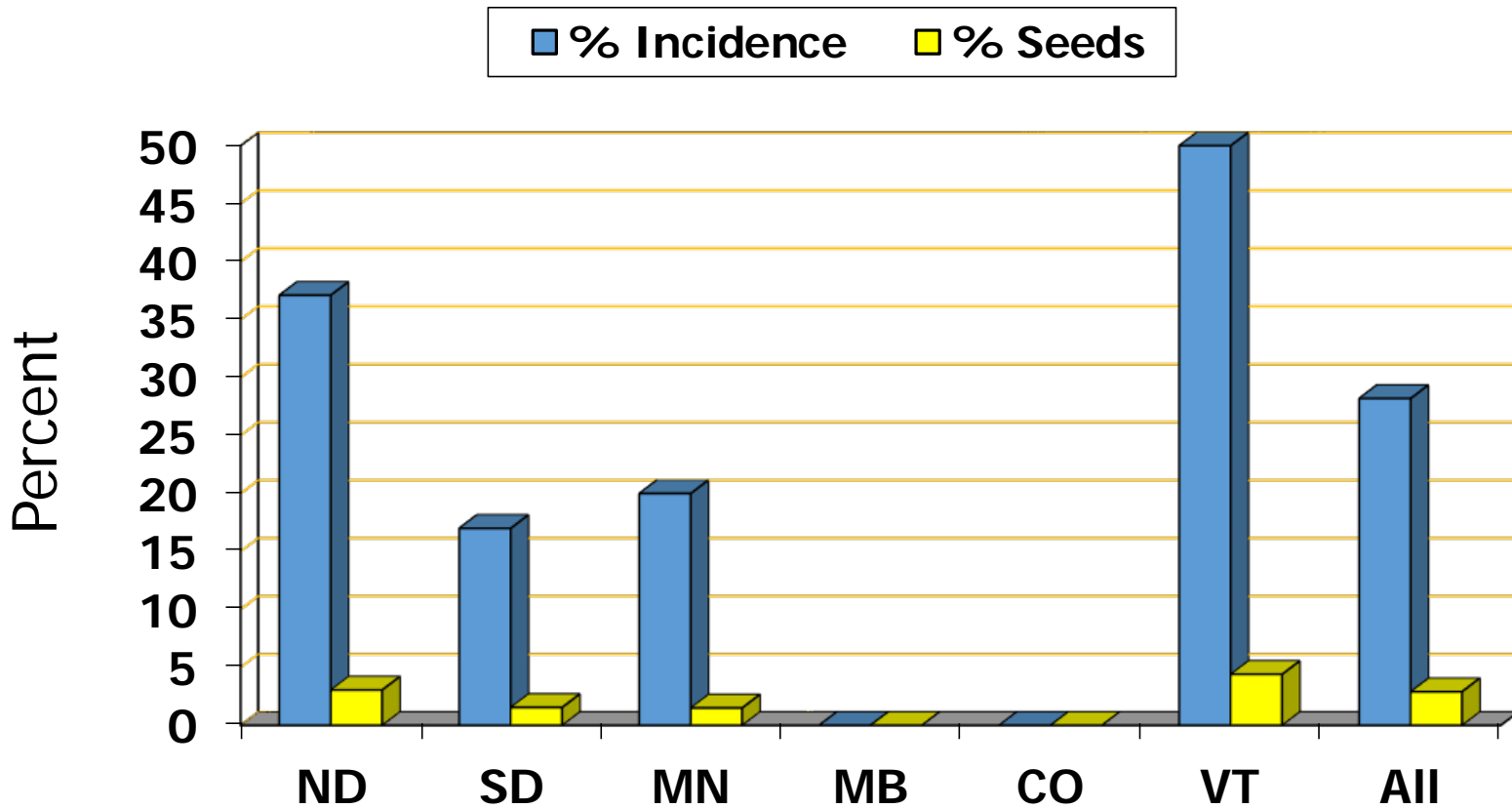
Seed Weevil Incidence and Severity in Sunflower 2013



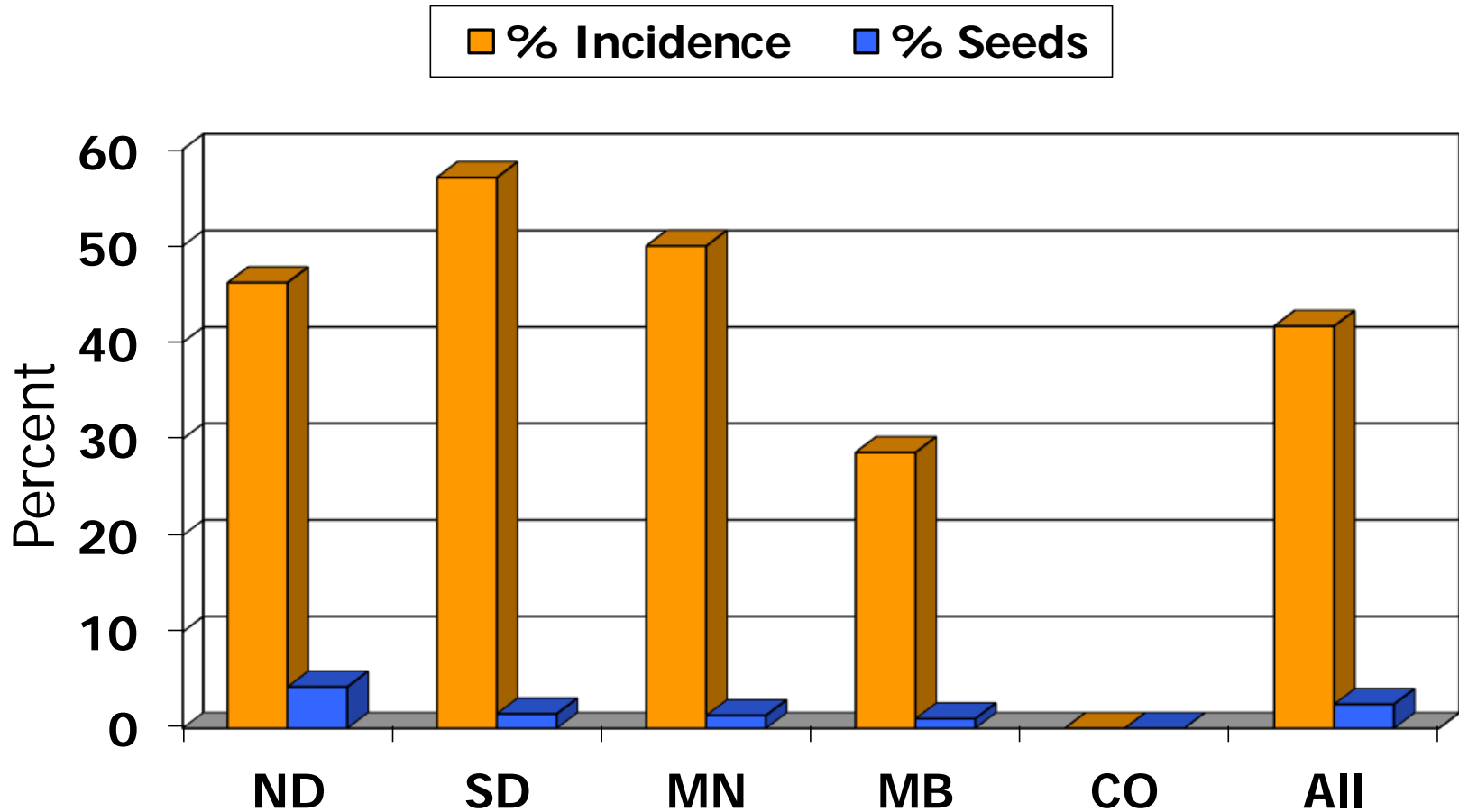
Seed Damage - Weevil in Sunflower 2009-2013



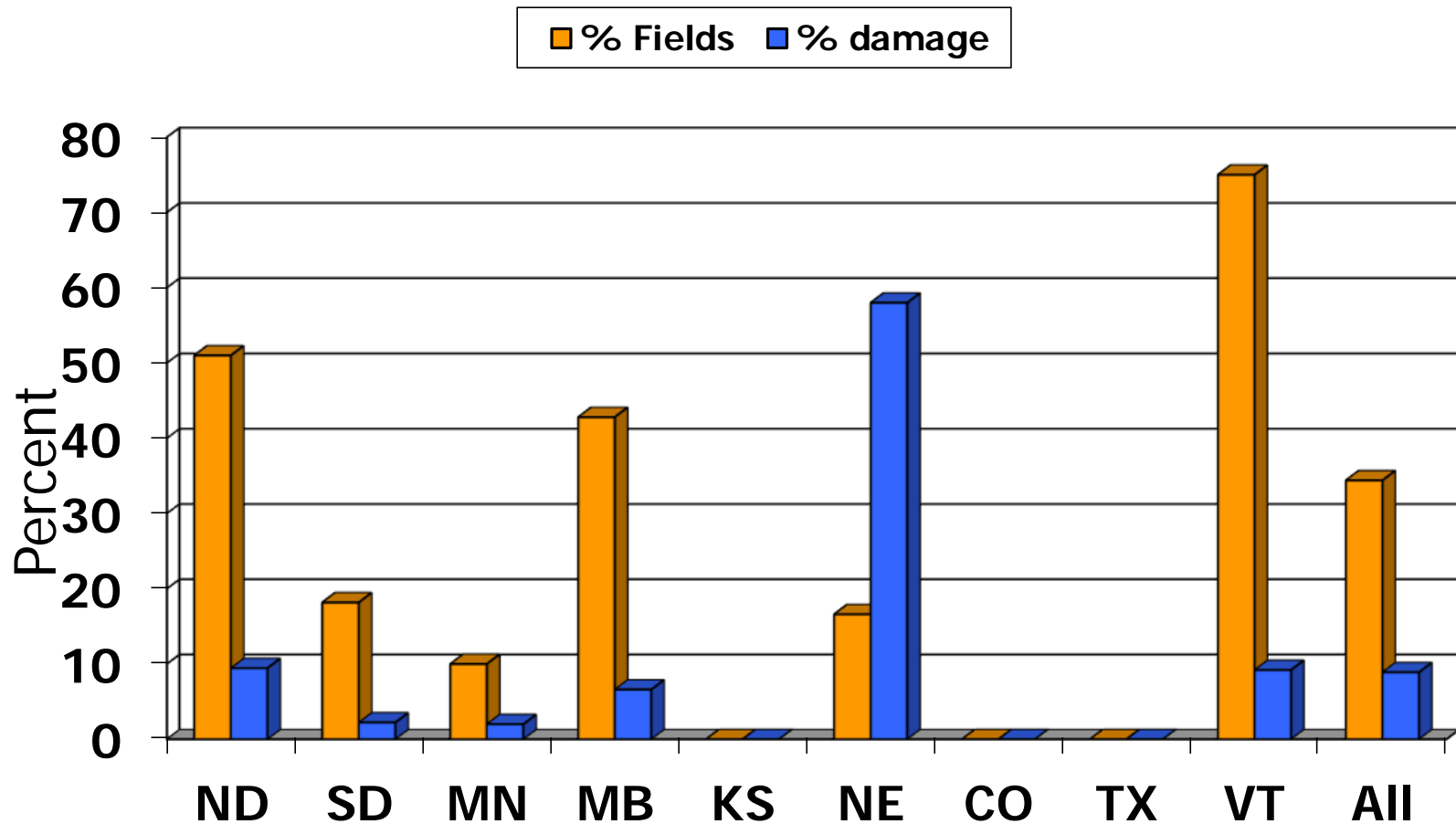
Banded Sunflower Moth Incidence and Severity in 2013



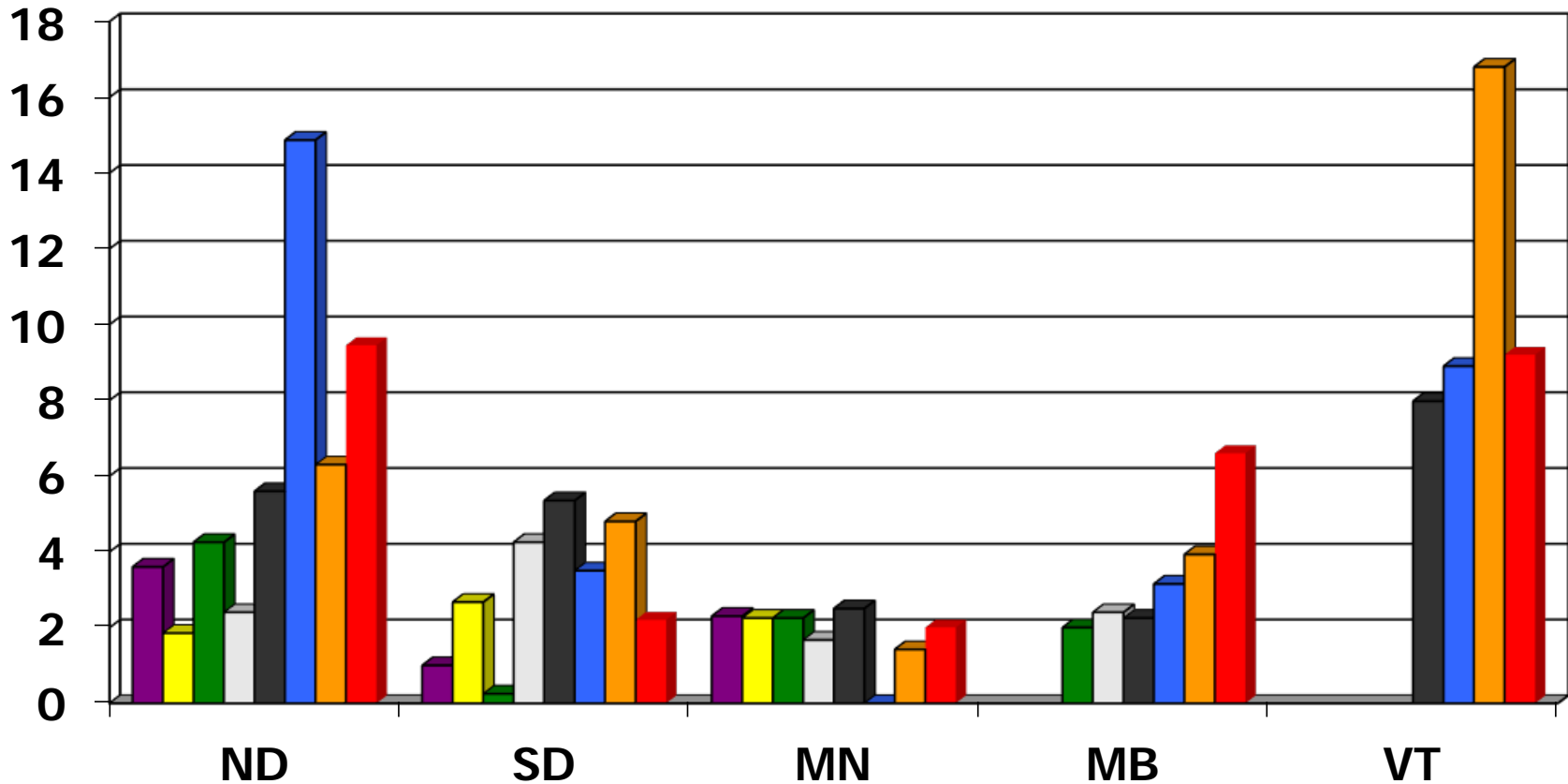
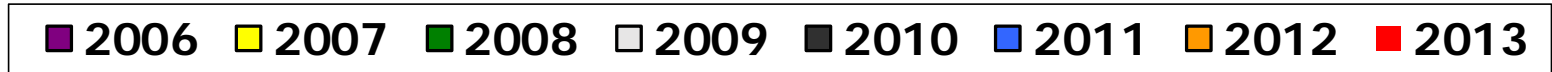
Brown Spot Incidence and Severity in 2013 (confectionary)



Bird Incidence and Severity in Sunflower 2013



% Bird Damage per Head in Fields Sunflower 2006-2013



Top Weeds Observed: 2013

North Dakota

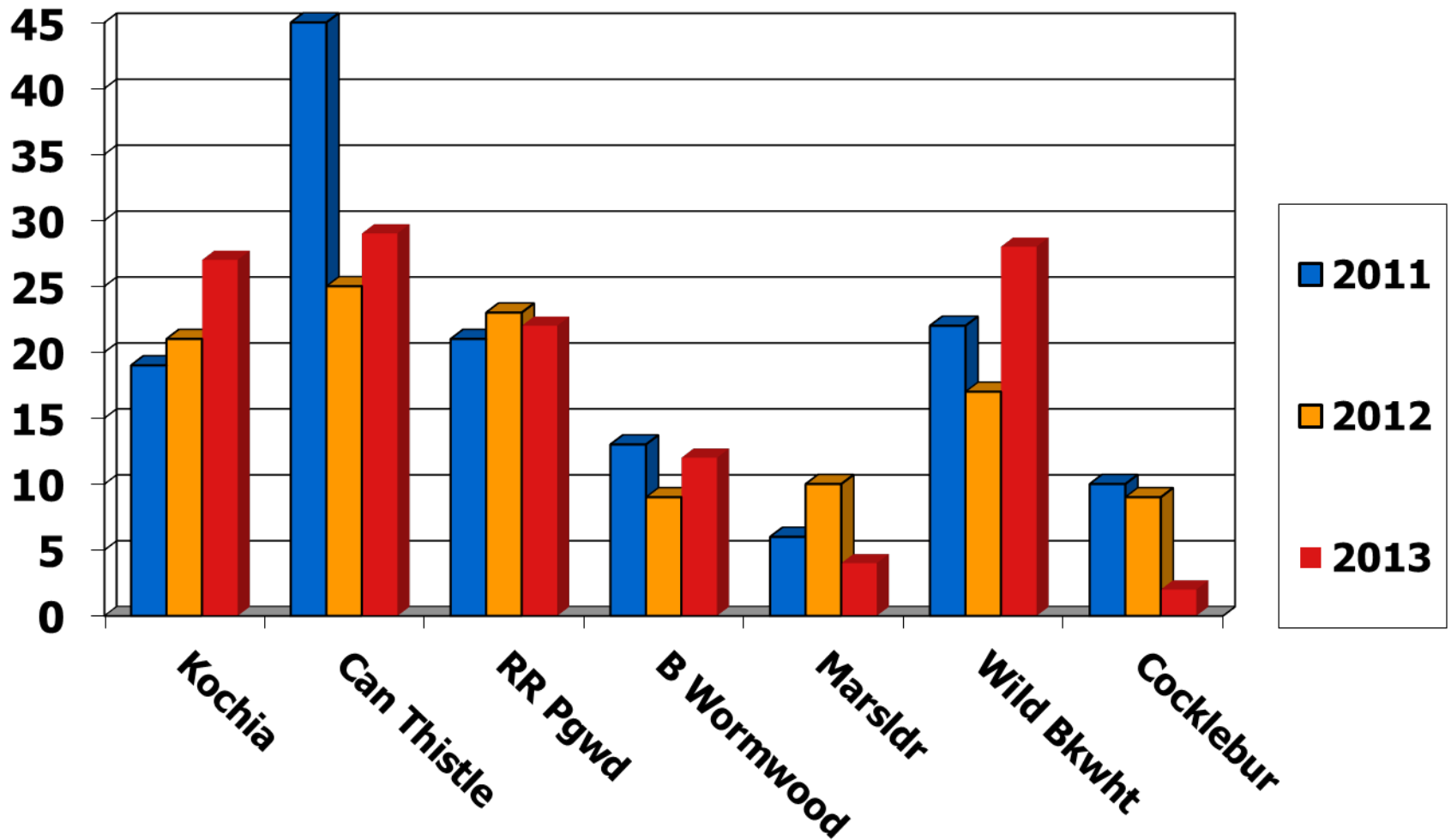
- Biennial wormwood
- Canada thistle
- Cockle Bur
- Lambsquarter
- Kochia
- Red root Pig Weed
- Russian thistle
- Rag weed-common
- Foxtail green & yellow

Minnesota

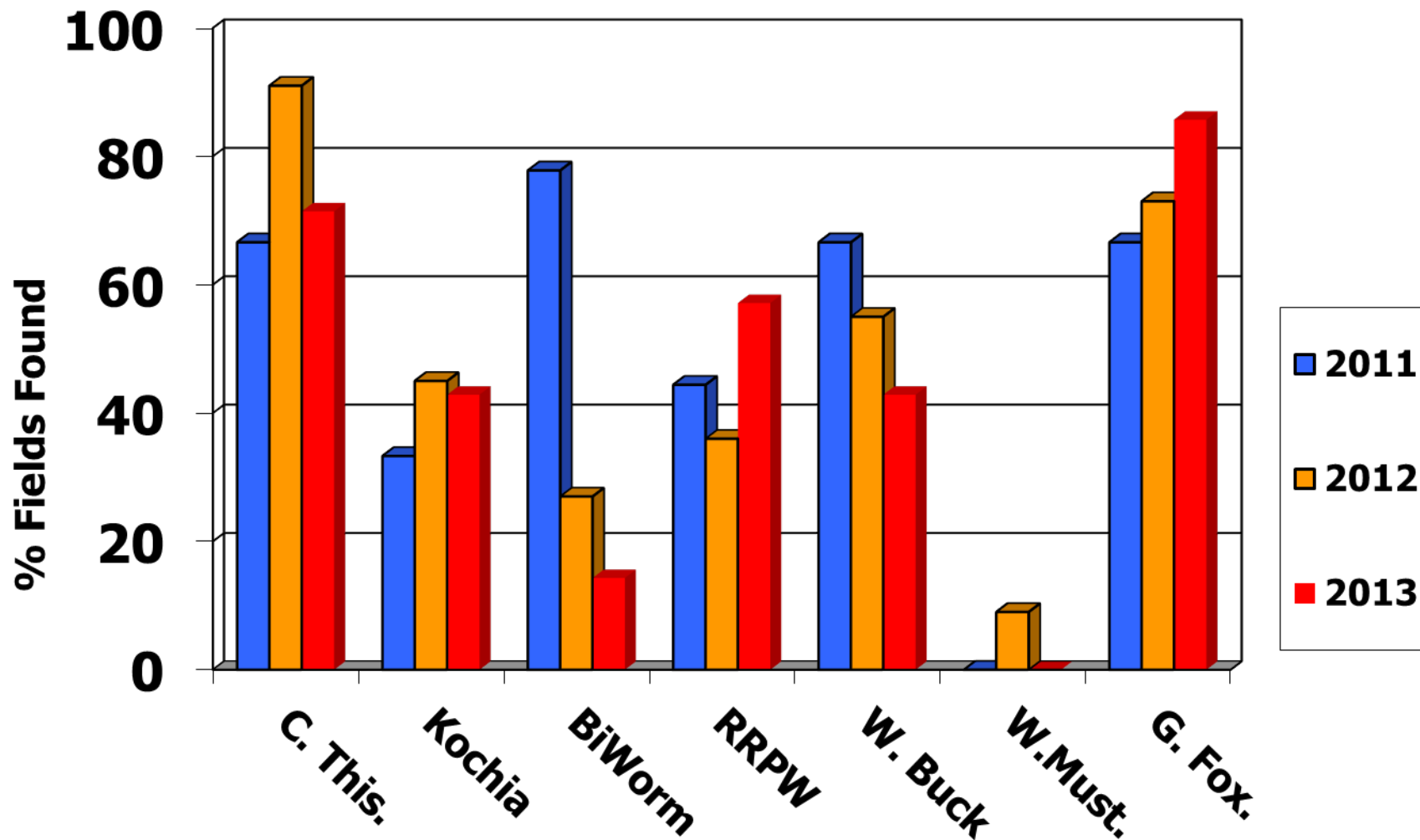
- Biennial wormwood
- Canada thistle
- Lambsquarter
- Marsh elder
- Rag weed-common
- Field sandbur
- Foxtail green



Incidence of Broadleaf Weeds ND/MN 2011-2013



Incidence of Weeds Observed in Manitoba 2008-2013



Top Five Weeds in South Dakota

2010-2013

2010

- Green foxtail
- Kochia
- Redroot pigweed
- Russian thistle
- Cocklebur

2011

- Kochia
- Lanceleaf sage
- Redroot pigweed
- Russian thistle
- Green foxtail

2012

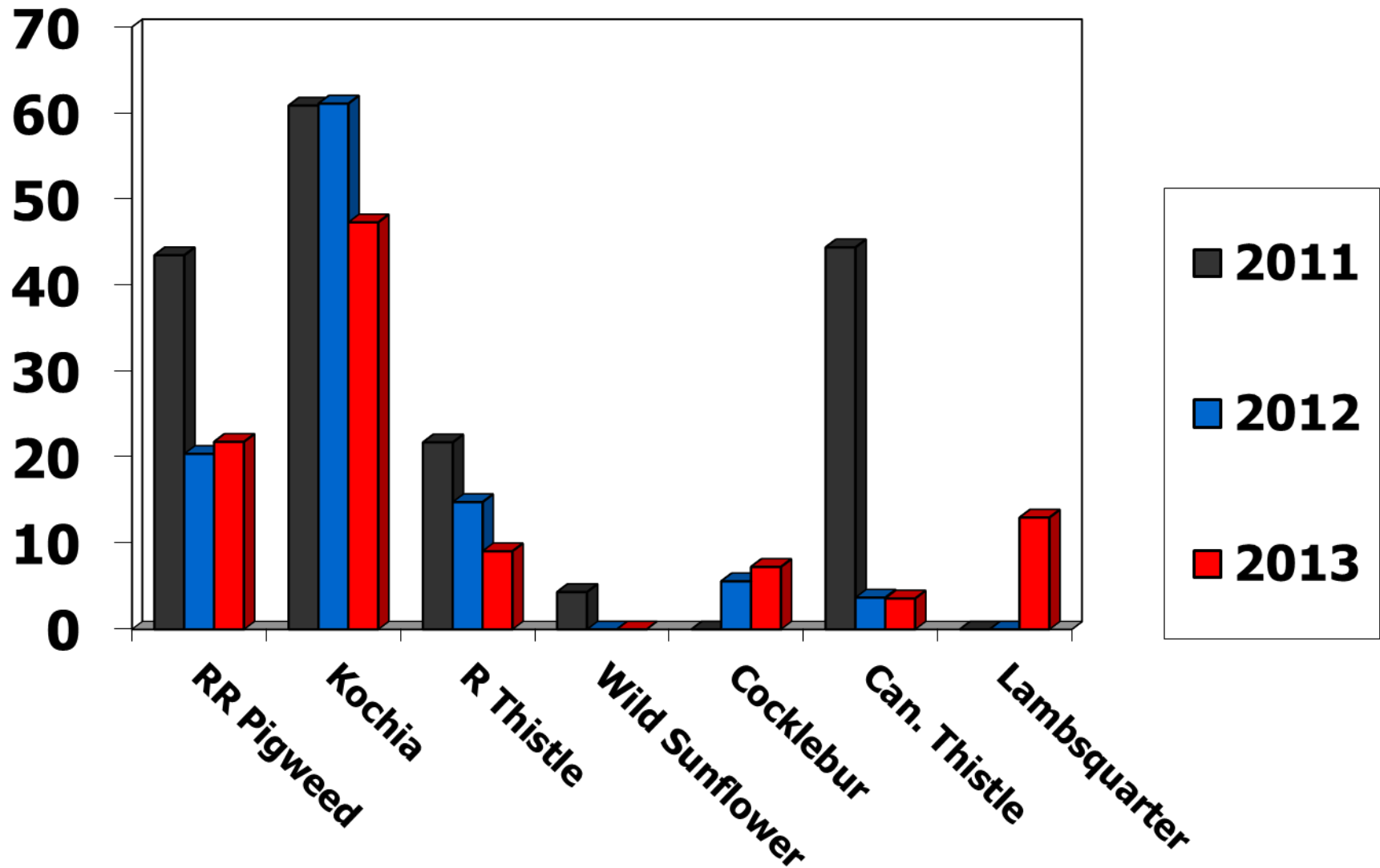
- Kochia
- Lanceleaf sage
- Redroot pigweed
- Russian thistle
- Green foxtail

2013

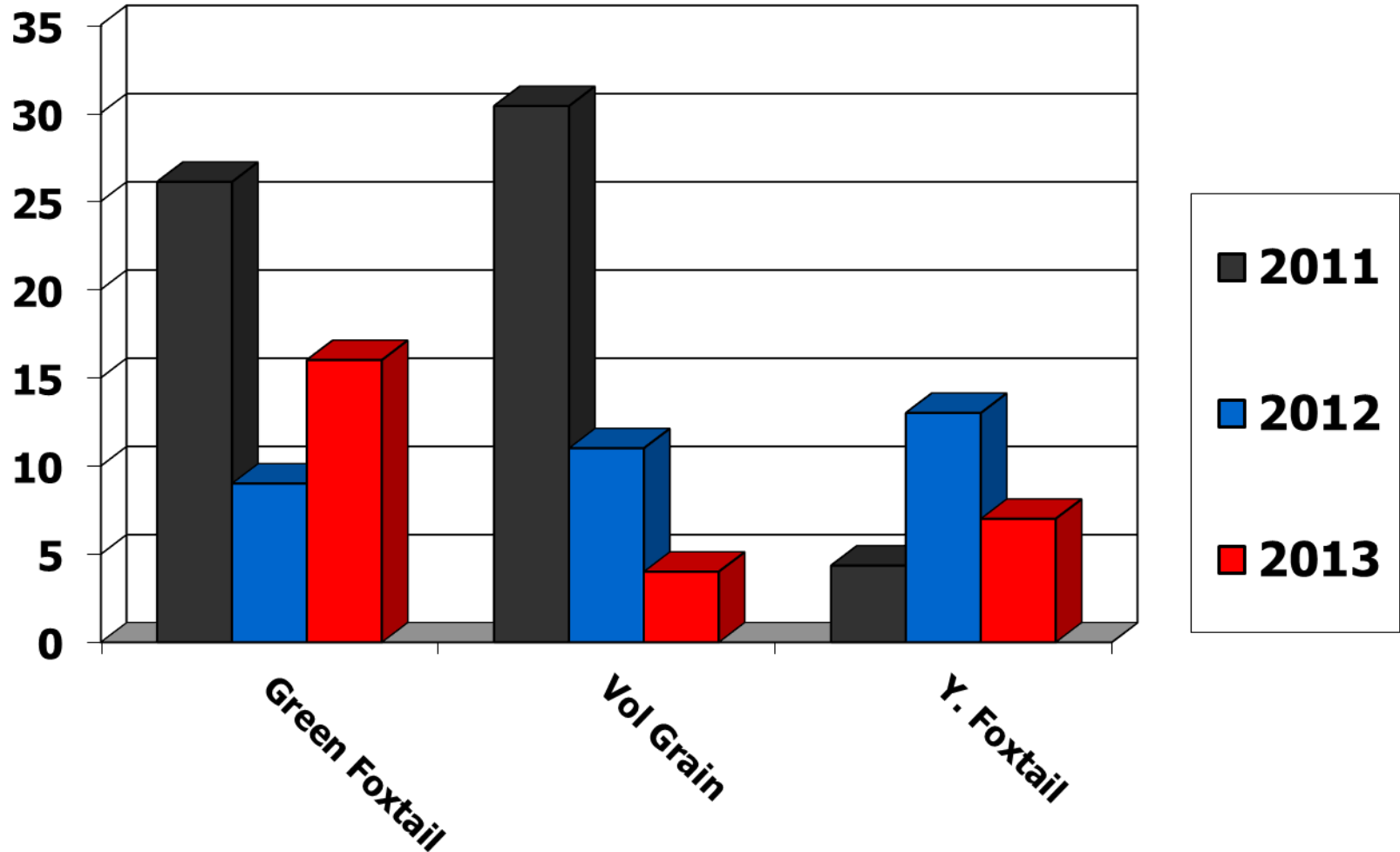
- Kochia
- Redroot pigweed
- Green foxtail
- Lambsquarter
- Russian Thistle/rag weed/wild buckwheat



Incidence of Broadleaf Weeds South Dakota 2011-2013



Incidence of Grassy Weeds South Dakota 2008 - 2013



Top Weeds Observed: 2013

Colorado

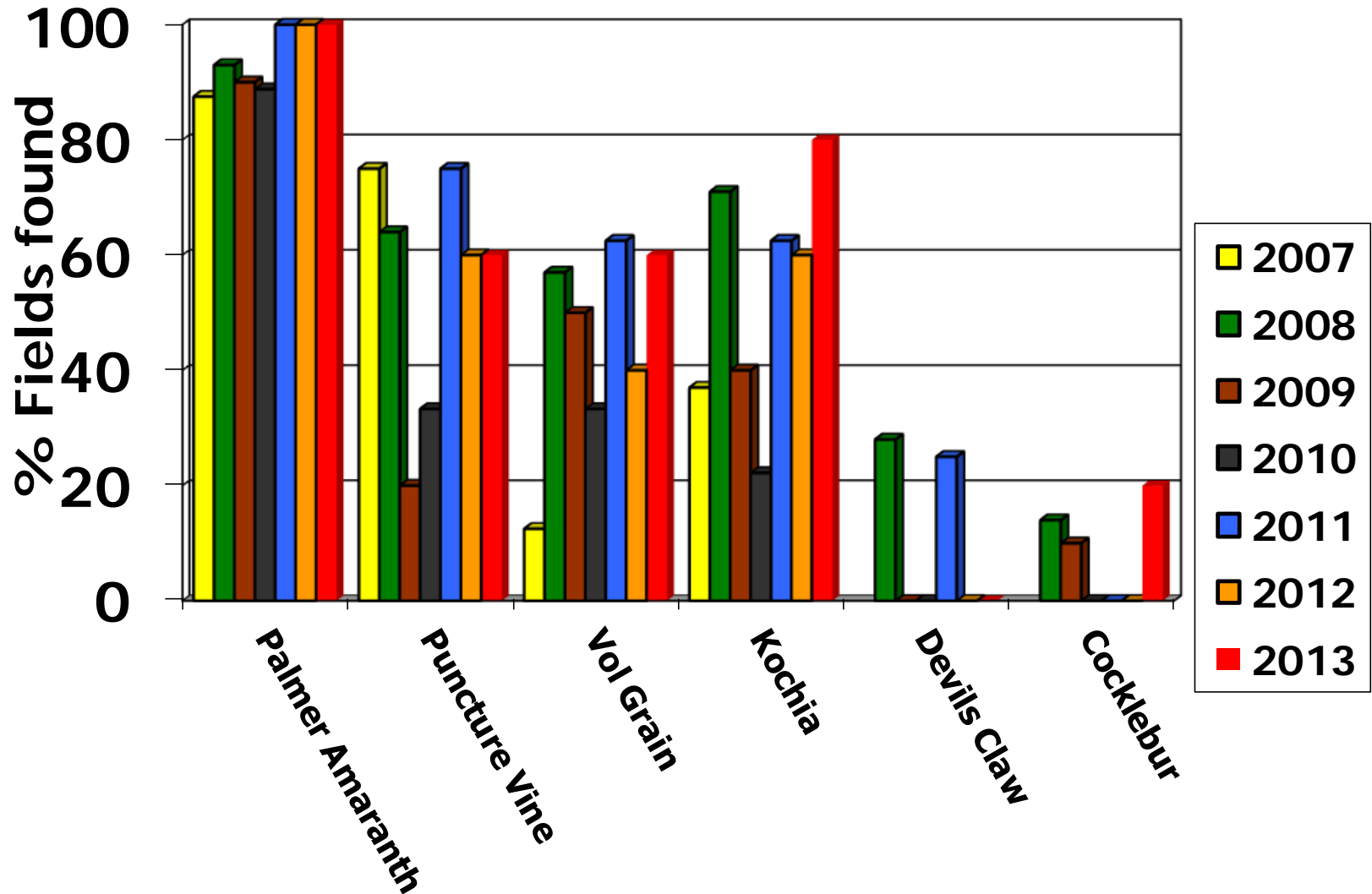
- Red root pig weed
- Russian thistle
- Nightshade
- Lanceleaf sage

Kansas

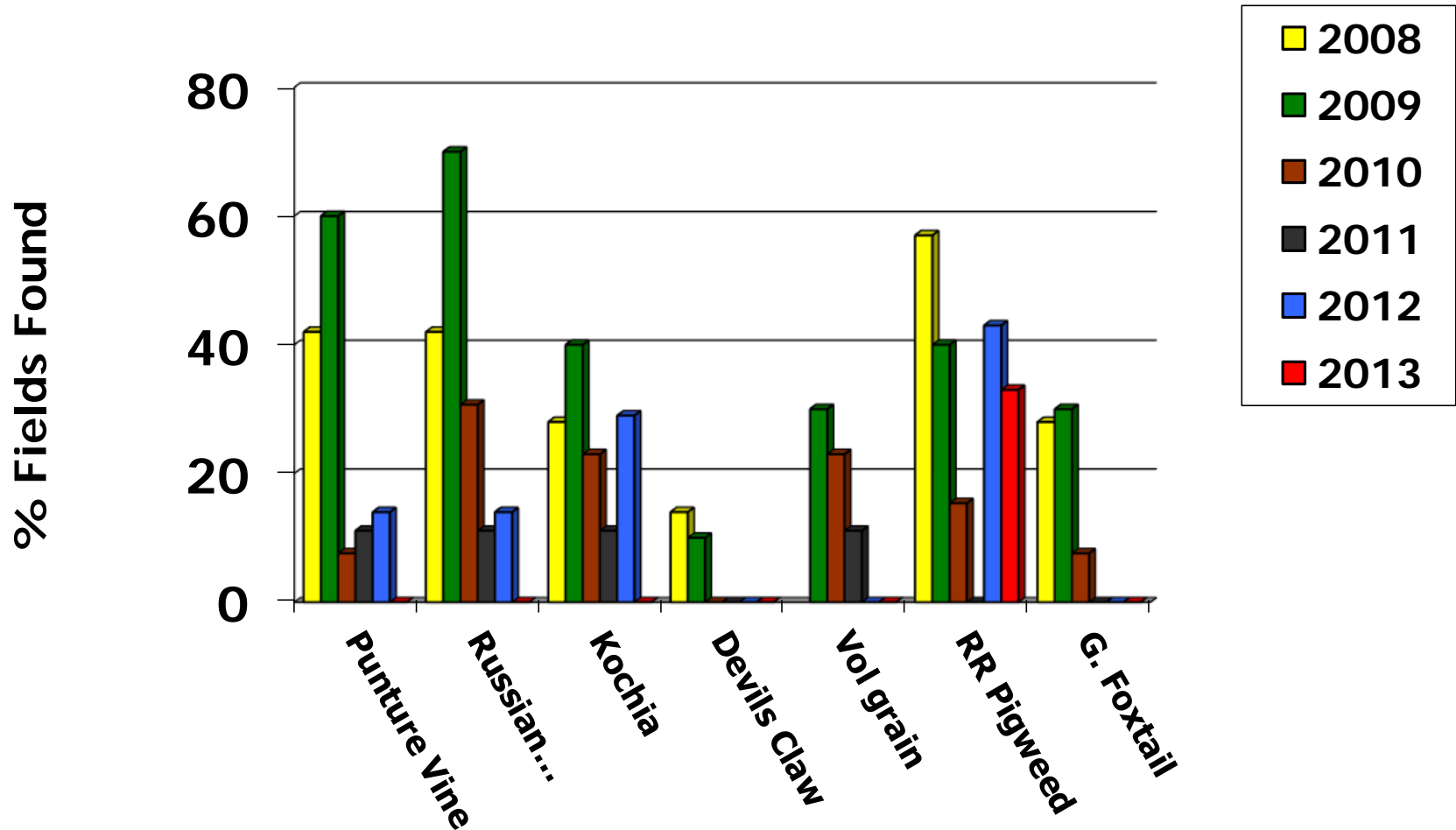
- Palmer amaranth
- Kochia
- Puncture vine
- Volunteer grain



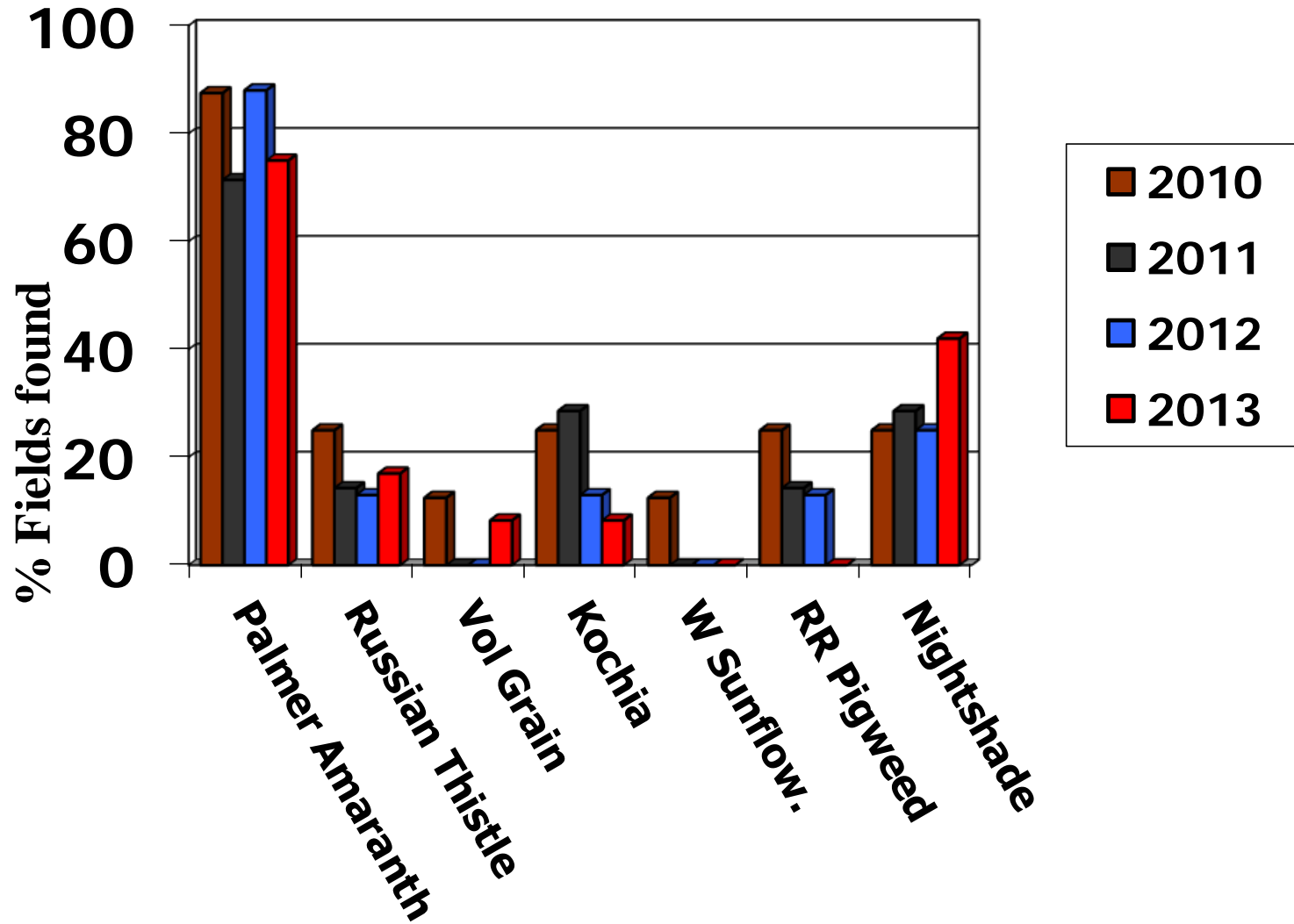
Incidence of Weeds in Kansas



Incidence of Weeds in Colorado 2008-2013



Incidence of Weeds in Texas



*2013 Sunflower Survey
Sponsored by the National
Sunflower Association*

