

**USA  
Sunflower Survey**



*Partnership of  
University, USDA & Industry*

**2011 National  
Sunflower  
Association  
Survey**

**Project Leader:**

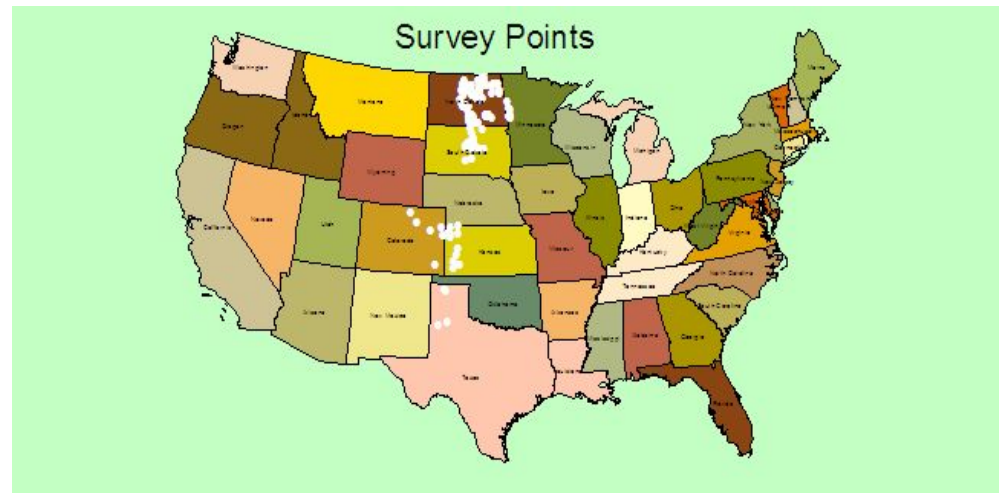
**Hans Kandel Extension Agronomist**

**NDSU Crop Science Department**

# 2011 Sunflower Survey- # Fields



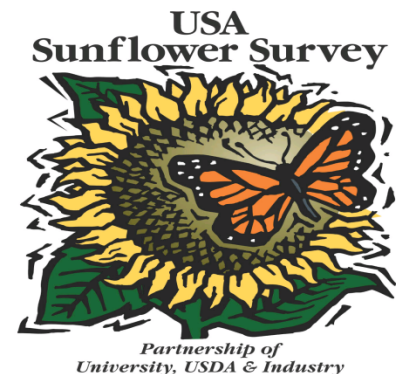
- North Dakota-77
- Minnesota-9
- South Dakota-23
- Kansas-8
- Colorado-9
- Nebraska-5
- Manitoba-9
- Oklahoma-too dry
- Texas-7
- Vermont-8
- **TOTAL- 155**



# 2011 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

\* Highest # Surveyed



# 2011 Sunflower Crop Survey Teams

- North Dakota 9 teams
- South Dakota 6 teams
- Kansas 1 team
- Colorado 2 teams
- Minnesota 2 teams
- Nebraska 1 team
- Texas 1 team
- Manitoba 1 team
- Vermont 1 team
- Texas 1 team

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Total of 25 teams



## 2011 Sunflower Yield and Management Practices

Team # \_\_\_\_\_ County \_\_\_\_\_ Field # \_\_\_\_\_ Oil (1) \_\_\_\_\_ Conf (2) \_\_\_\_\_.

GPS North \_\_\_\_\_ GPS West \_\_\_\_\_ Dryland (1) \_\_\_\_\_ Irrigated (2) \_\_\_\_\_.

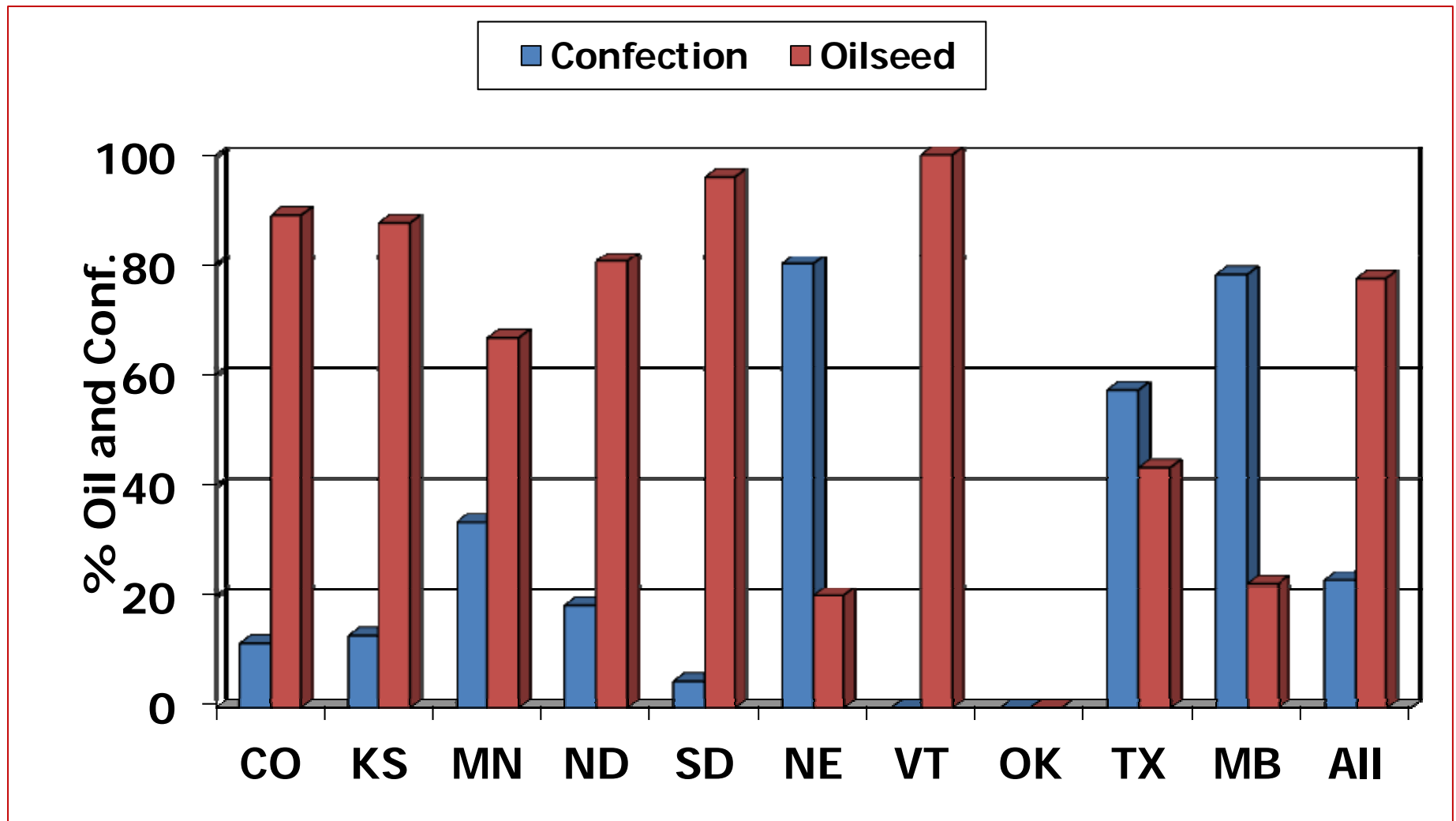
Yield Data:		Plants / Pop.	Head Diameter	Seed Size	% Good Seed	Center Seed Set	Previous Crop
1st count							
2nd count							
Average							

**Calculation:**

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

<b>Management Practices:</b>	<b>Row Spacing</b> 20" or less - 1 _____      21" or Greater - 2 _____
	_____ Conv-till-

# % Confection and Oilseed Sunflower-2011 Survey











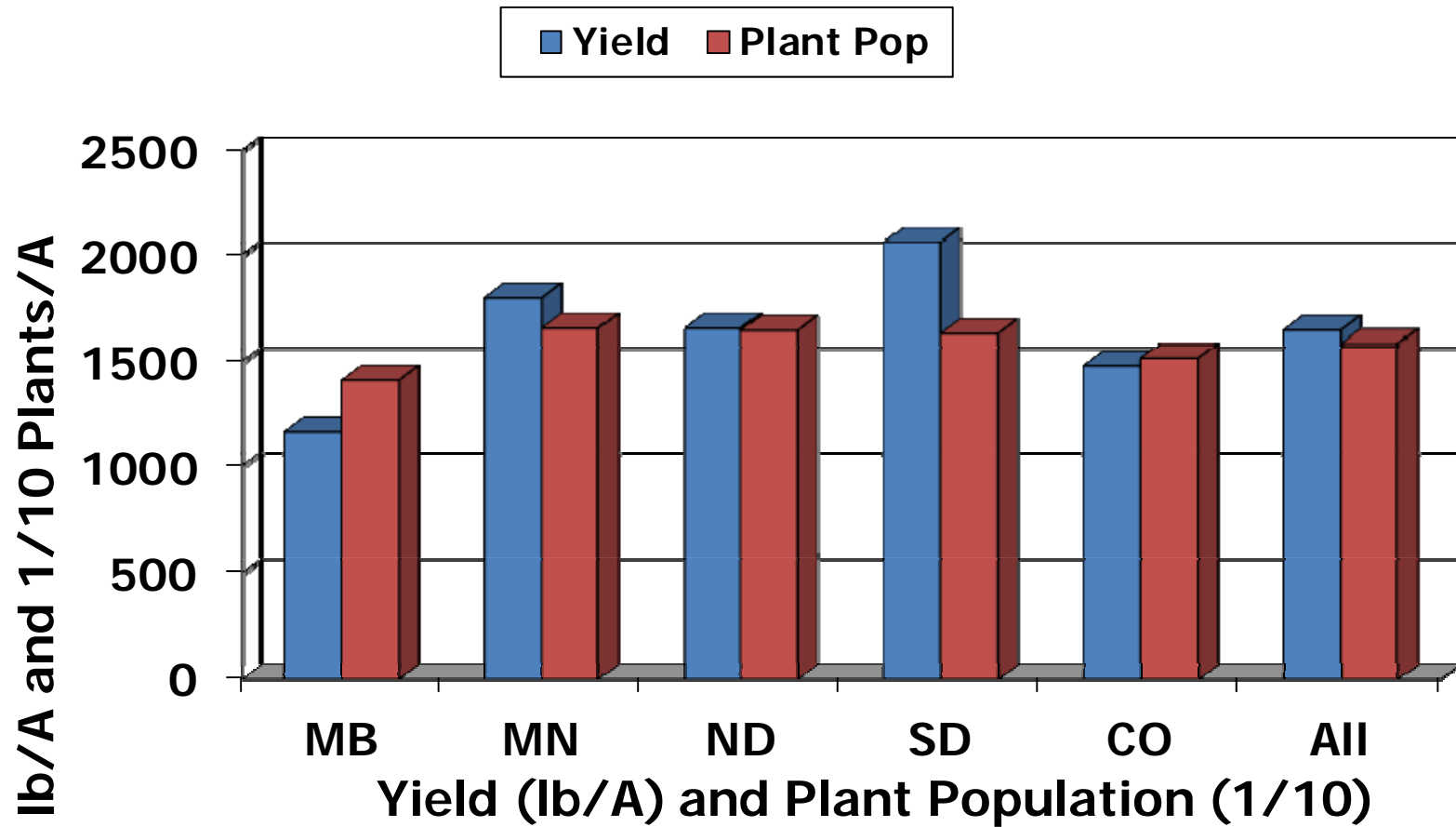
# Head fill and seed size



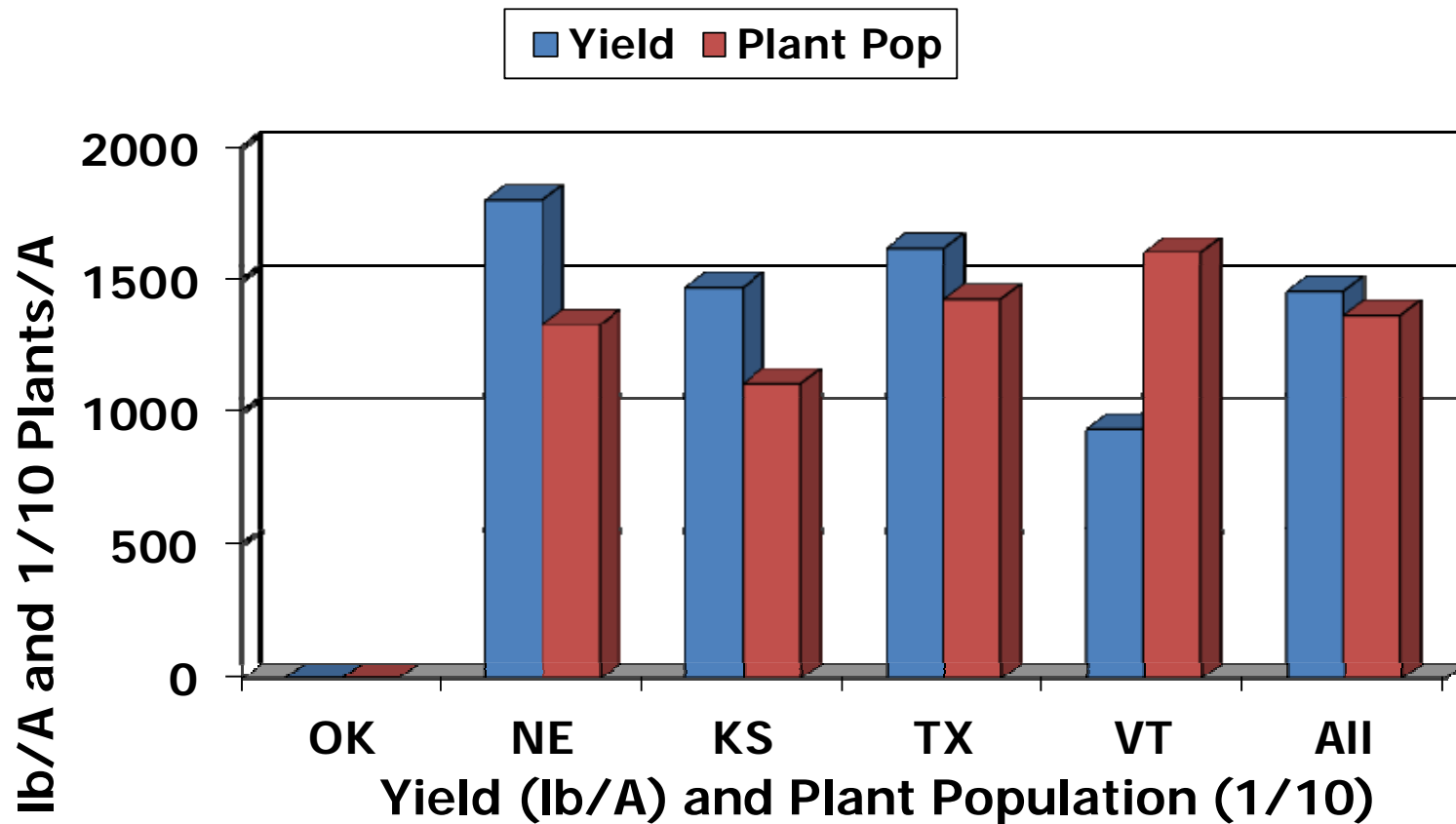




# Sunflower Yield and Plant Population: 2011

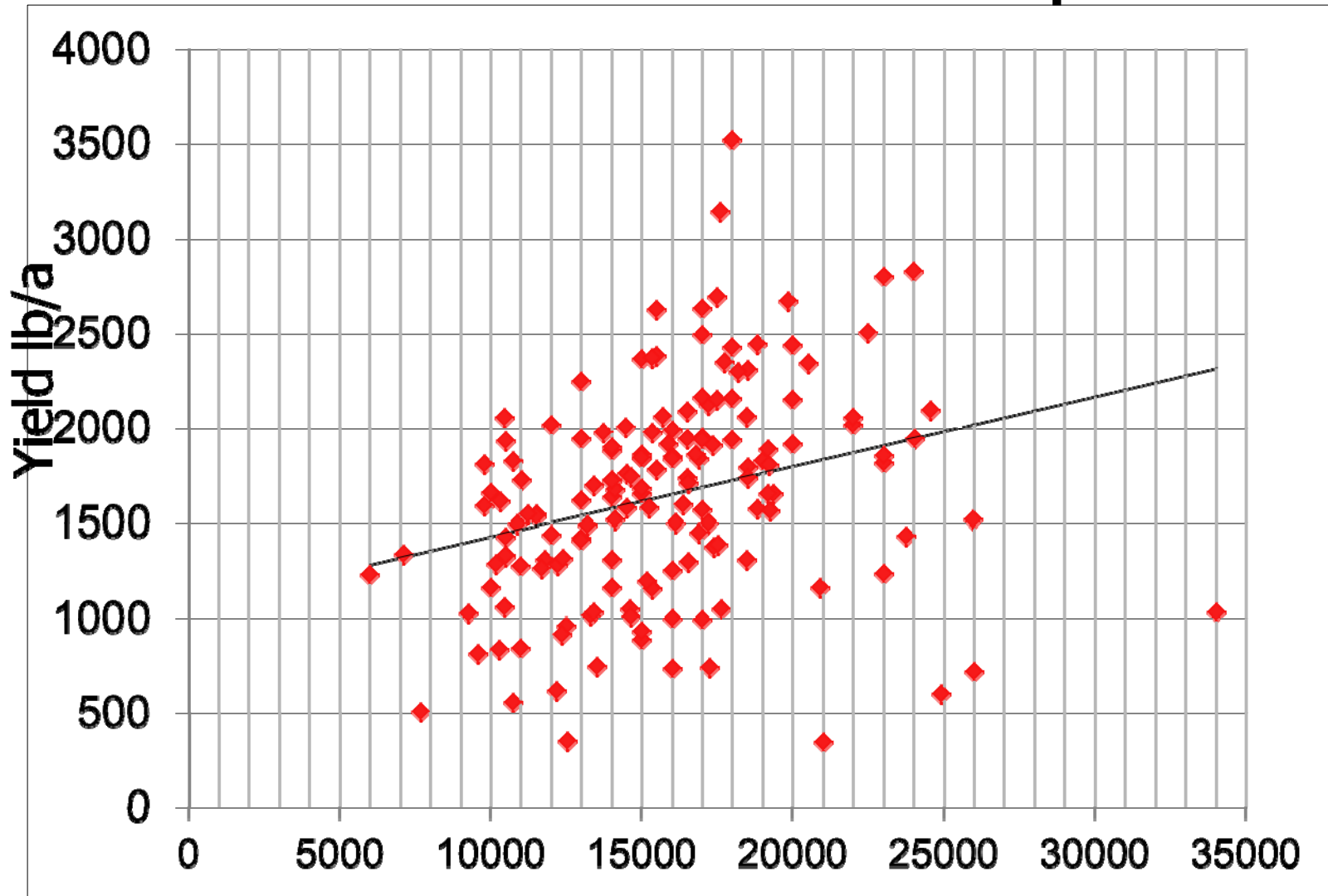


# Sunflower Yield and Plant Population: 2011





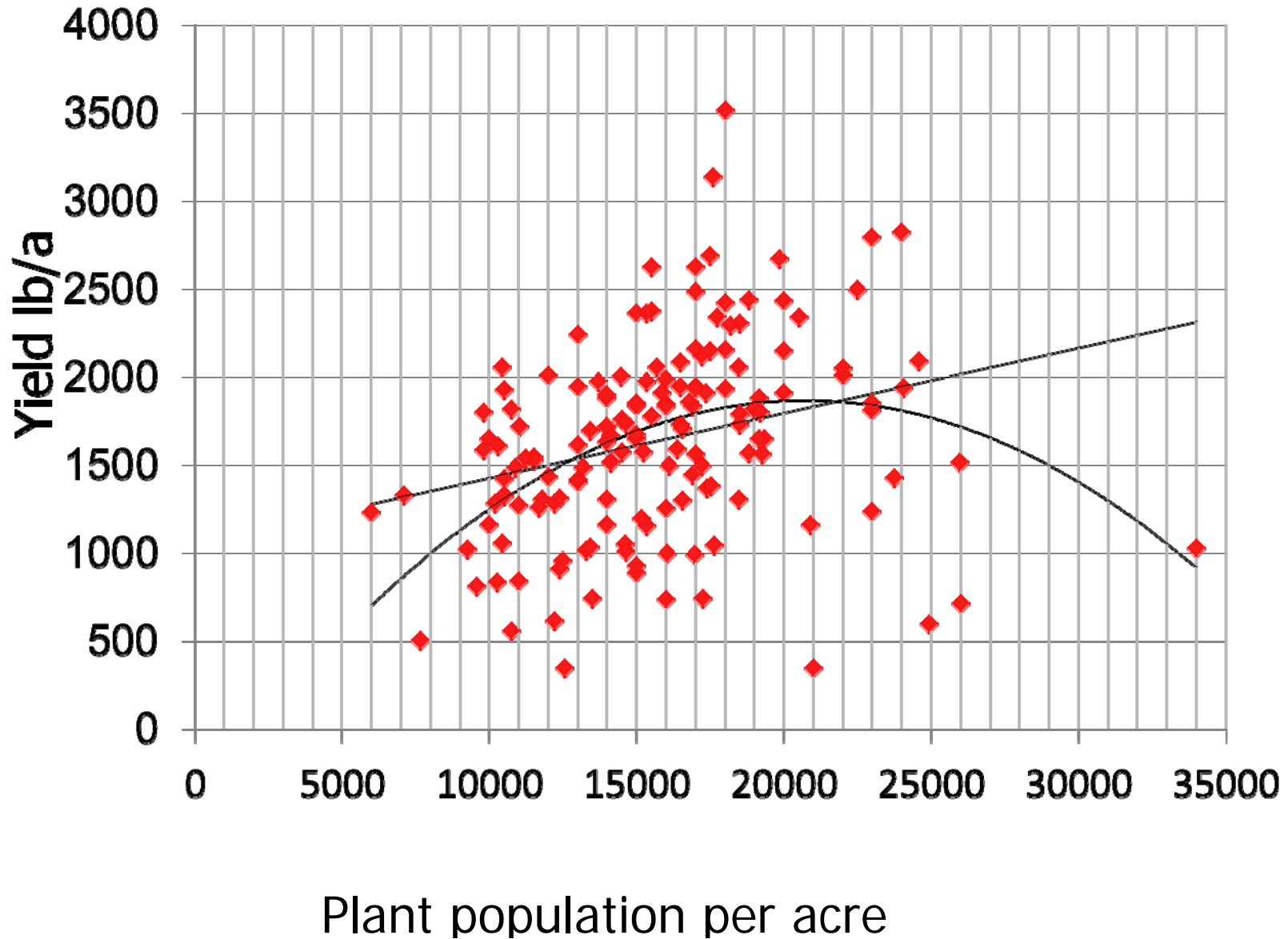
# 2011 Yield vs. Plant Population



Plant population per acre

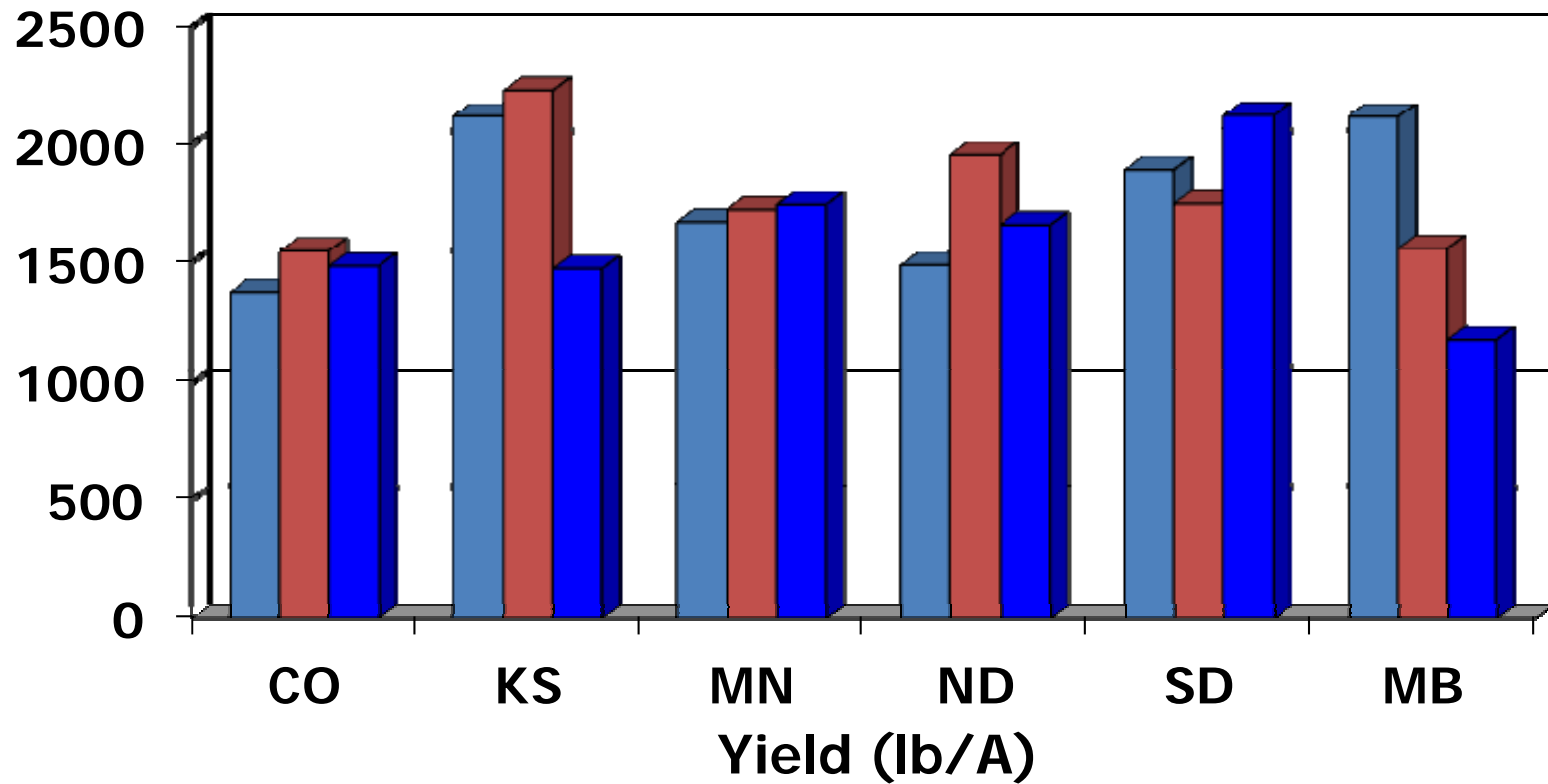


# 2011 Yield vs. Plant Population

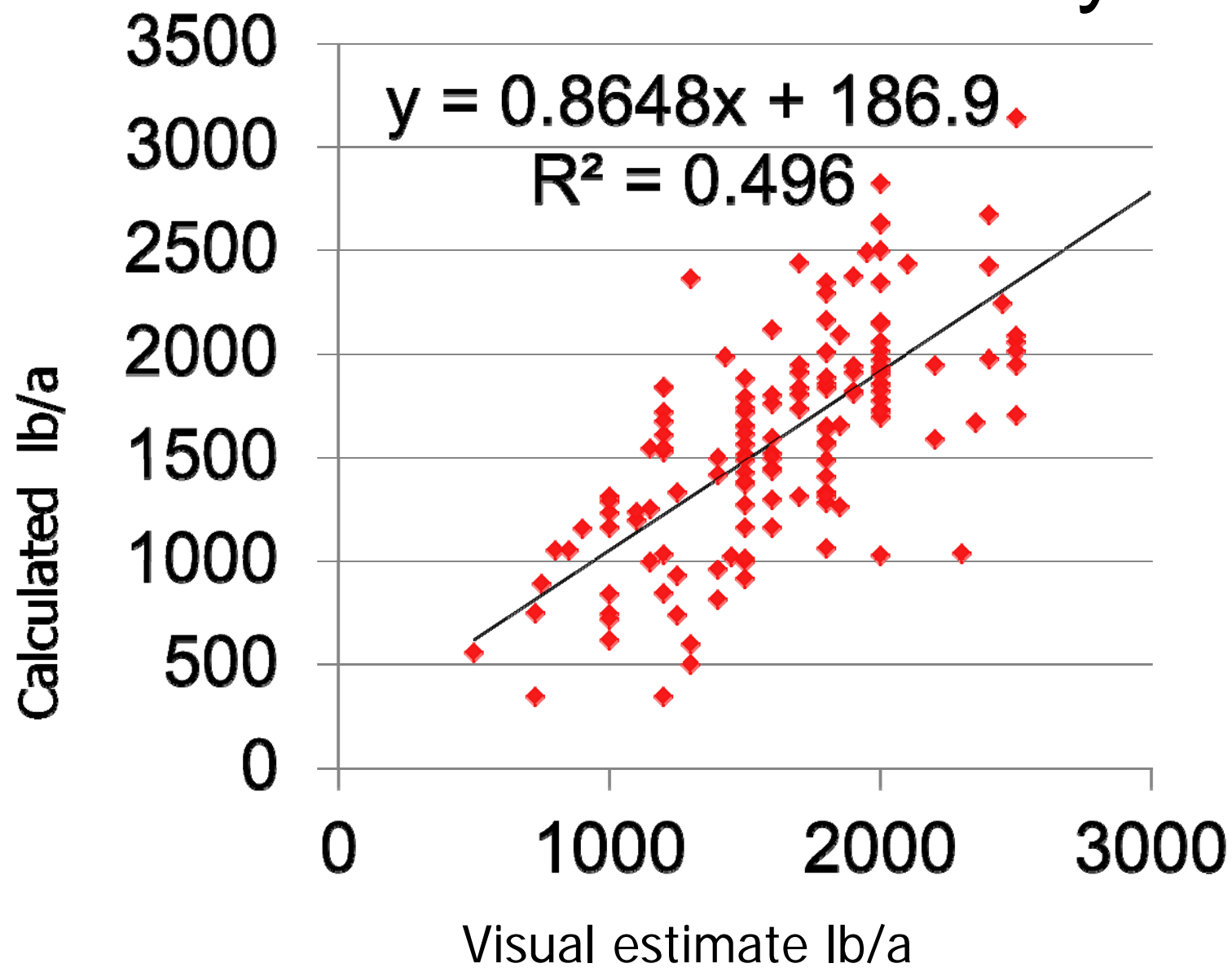


# Sunflower Yield : lb/a

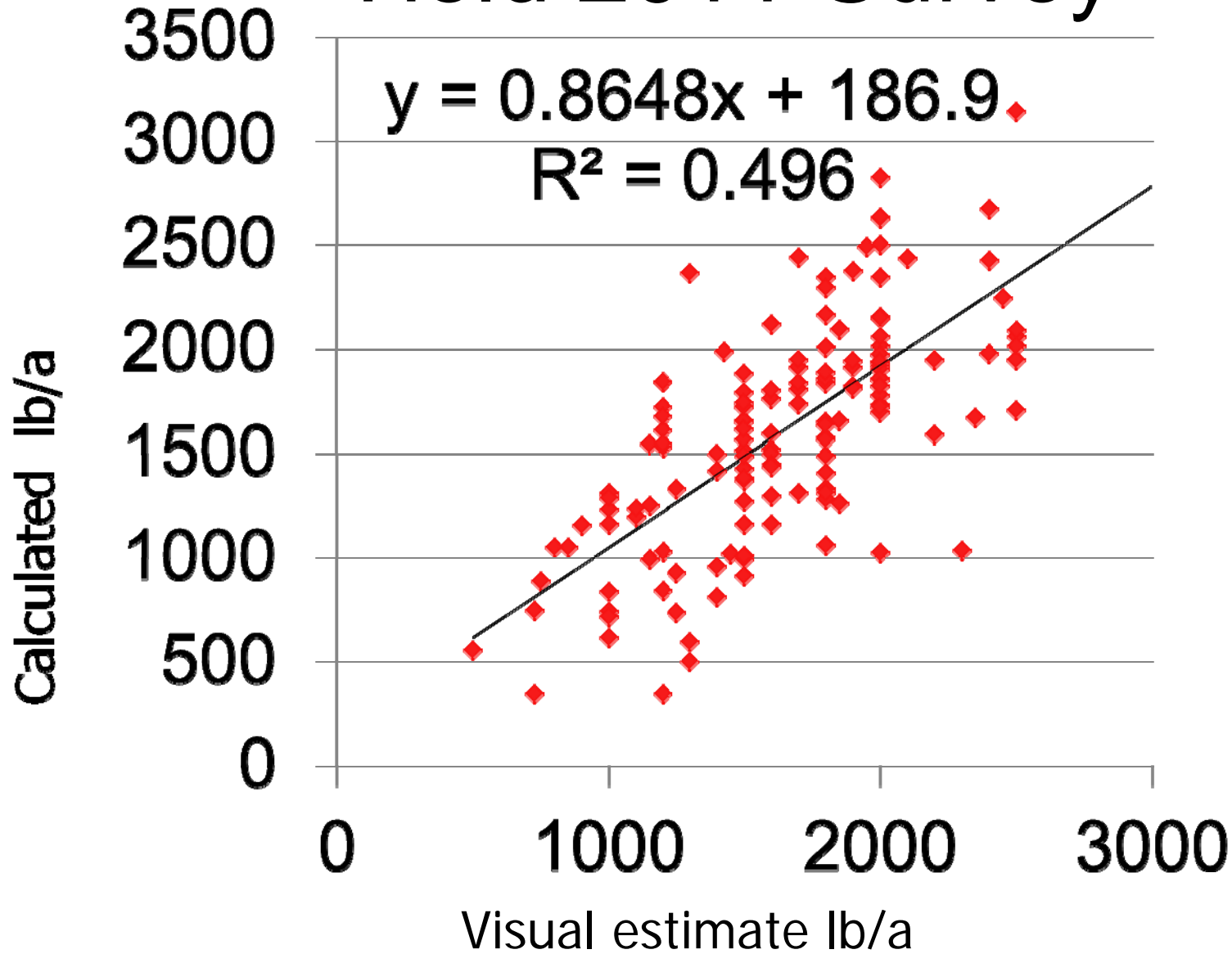
## 2009-2011



# Yield 2011 Survey



# Yield 2011 Survey



Estimate  
1649 lb/a  
Calculated  
1613 lb/a



# 2010 #1 Yield Limiting Factors - combined (207 Fields)

- Disease 20.7%
- Plant spacing within row 18.4%
- Lodging 8.7%
- Weeds 9.7%
- Birds 6.8%
- Insects 6.3%
- Drought 4.8%
- Drown out 3.4%
- Hail 1%
- Other 8.7% (many mentioned population)
- No Problem 11.6%



# 2011 #1 Yield Limiting Factors - combined (155 Fields)

- Disease 15.5%
- Plant spacing within row 18.1%
- Lodging 10.3%
- Weeds 8.4%
- Birds 8.4%
- Insects 5.2%
- Drought 8.4%
- Hail 2.6%
- Uneven plant growth 3.2%
- Other 6.5% (including population)
- No Problem 13.5%



# Frost ND 15 Sept



**Hail and Frost**



# Frost ND 15 Sept

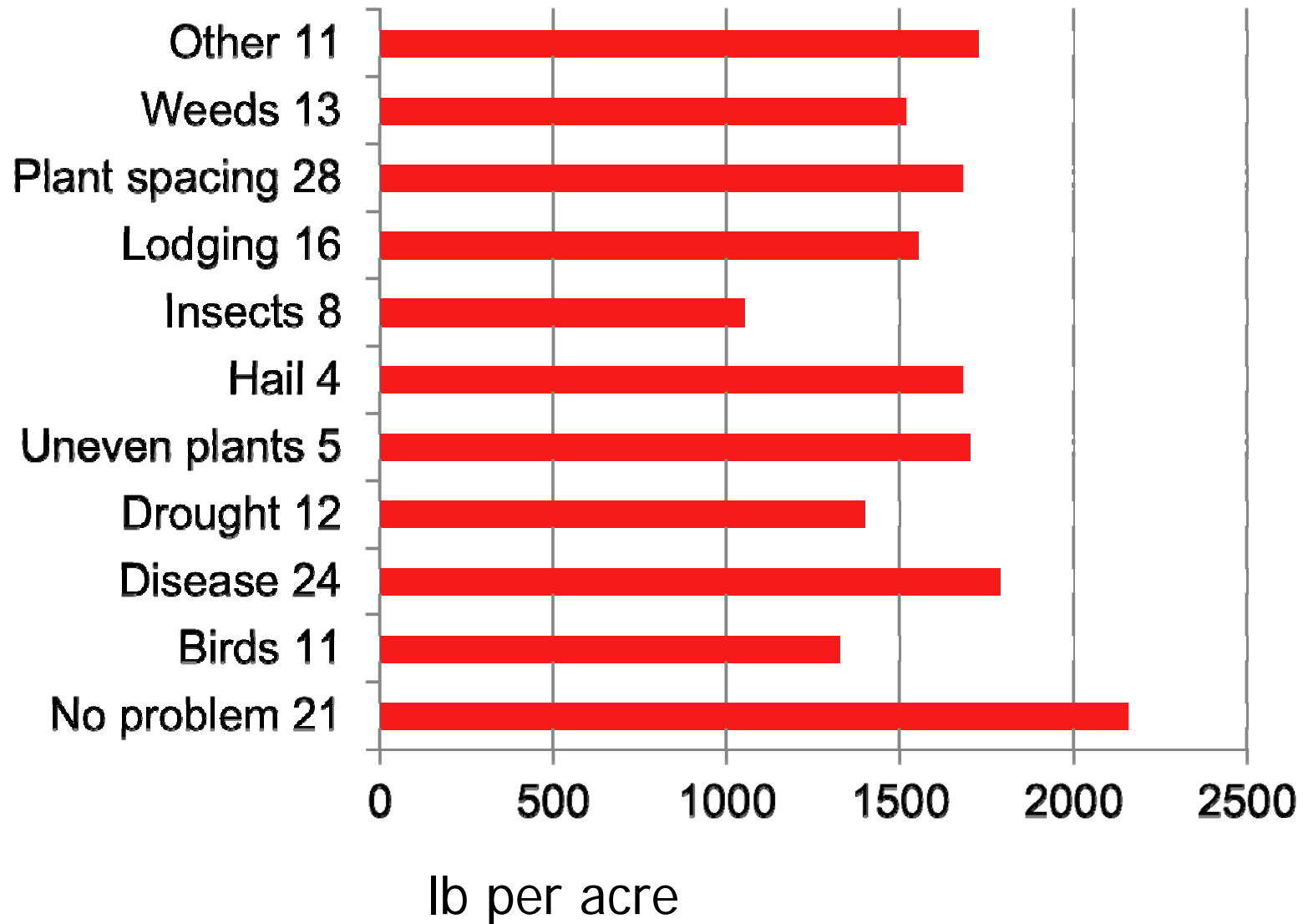




# Late planted sunflower



# Yield Limiting factor and Yield 2011









## 2010 #2 Yield Limiting Factors - combined (202 Fields)

- Plant spacing within row 14.9%
- Weeds 11.4%
- Insects 10.4%
- Disease 8.4%
- Birds 5.4%
- Lodging 4.5%
- Drown out 2.5%
- Drought 1.5%
- Hail 1%
- Other 4.9%
- No Problem 35.1%





## 2011 #2 Yield Limiting Factors- combined (155 Fields)

- Plant spacing within row 16.8%
- Uneven plant growth 0.6%
- Weeds 9.7%
- Insects 3.9%
- Disease 10.3%
- Birds 3.2%
- Lodging 7.7%
- Drought 3.2%
- Other 14.2%
- No Problem 30.3%



# 2011 #1 Yield Limiting Factors- North Dakota (77 Fields)

- Plant spacing 18.2%
- Disease 18.2%
- Lodging 13.0%
- Drought 1.3%
- Uneven plant growth 3.9%
- Birds 14.3%
- Weeds 3.9%
- Insects 1.3%
- Hail 3.9%
- Other 10.4%
- No Problem 11.7%



# 2011 #2 Yield Limiting Factors - North Dakota (77 Fields)

- Plant spacing 16.9%
- Disease 13.0%
- Weeds 10.4%
- Birds 3.9%
- Lodging 7.8%
- Drought 1.3%
- No Problem 27.3%
- Other 19.5%



# 2011 #1 and #2 Yield Limiting Factors - Minnesota (9 Fields)

## #1 factors:

- Disease 66.7%
- Lodging 11.1%
- Plant spacing 22.2%

## # 2 factors:

- Plant spacing 11.1%
- Disease 22.2%
- Insect 11.1%
- Other 11.1%
- No Problem 44.4%



# 2011 # 1 and #2

## Yield Limiting Factors- South Dakota (23 Fields)

### # 1 Factor

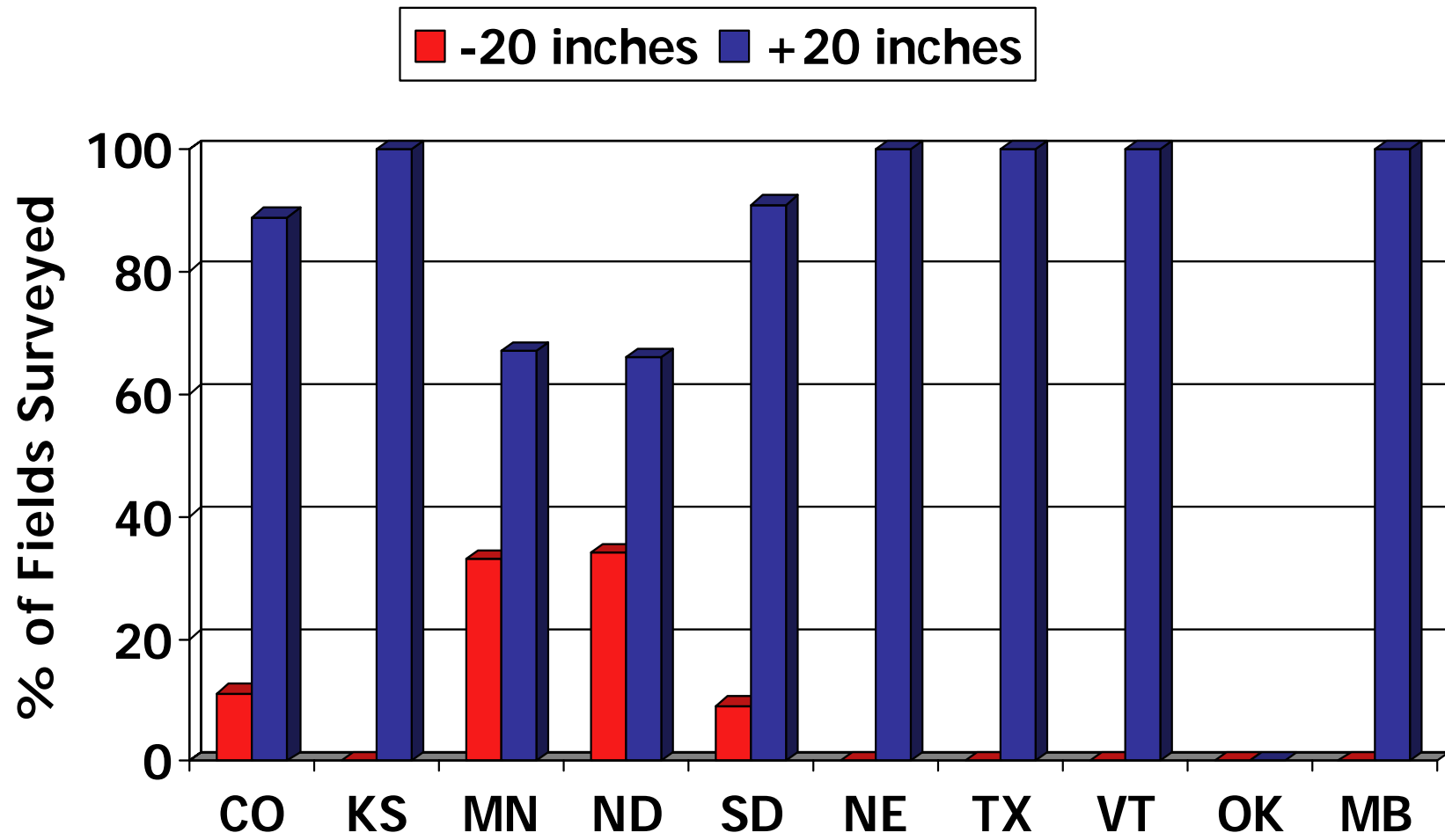
- Plant Spacing 30.4%
- Disease 13.0%
- Drought 4.4%
- Uneven plant growth 4.4%
- Lodging 13%
- Other 4.4%
- No problem 30.4%

### # 2 Factor

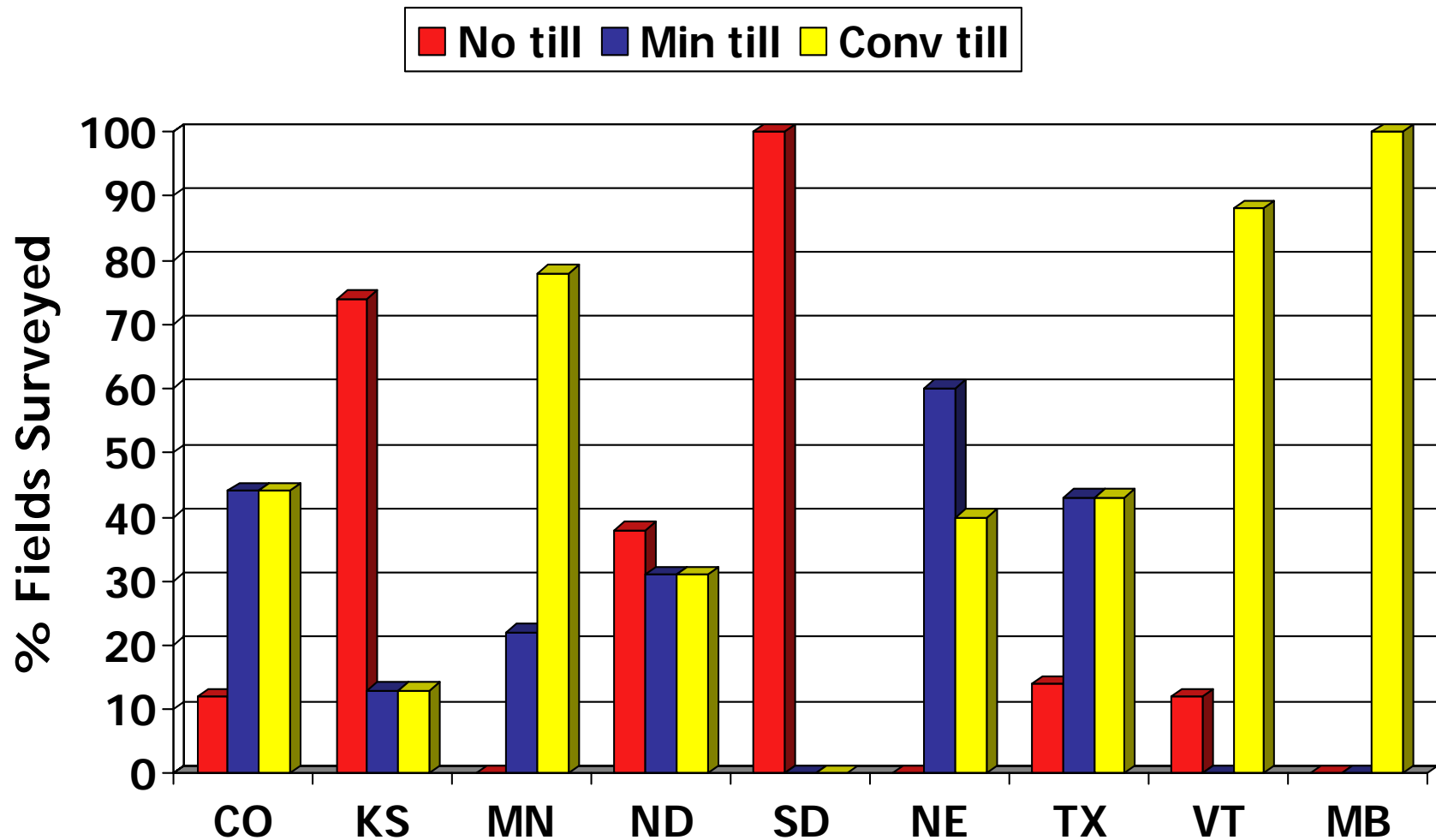
- Plant spacing 13.0
- Birds 8.7
- Disease 4.4
- Drought 8.7
- Insects 4.4
- Lodging 13.0
- Weeds 4.4
- Other 8.7
- No Problem 34.8



# Row Spacing Sunflower-2011



# Tillage: 2011 Sunflower Survey

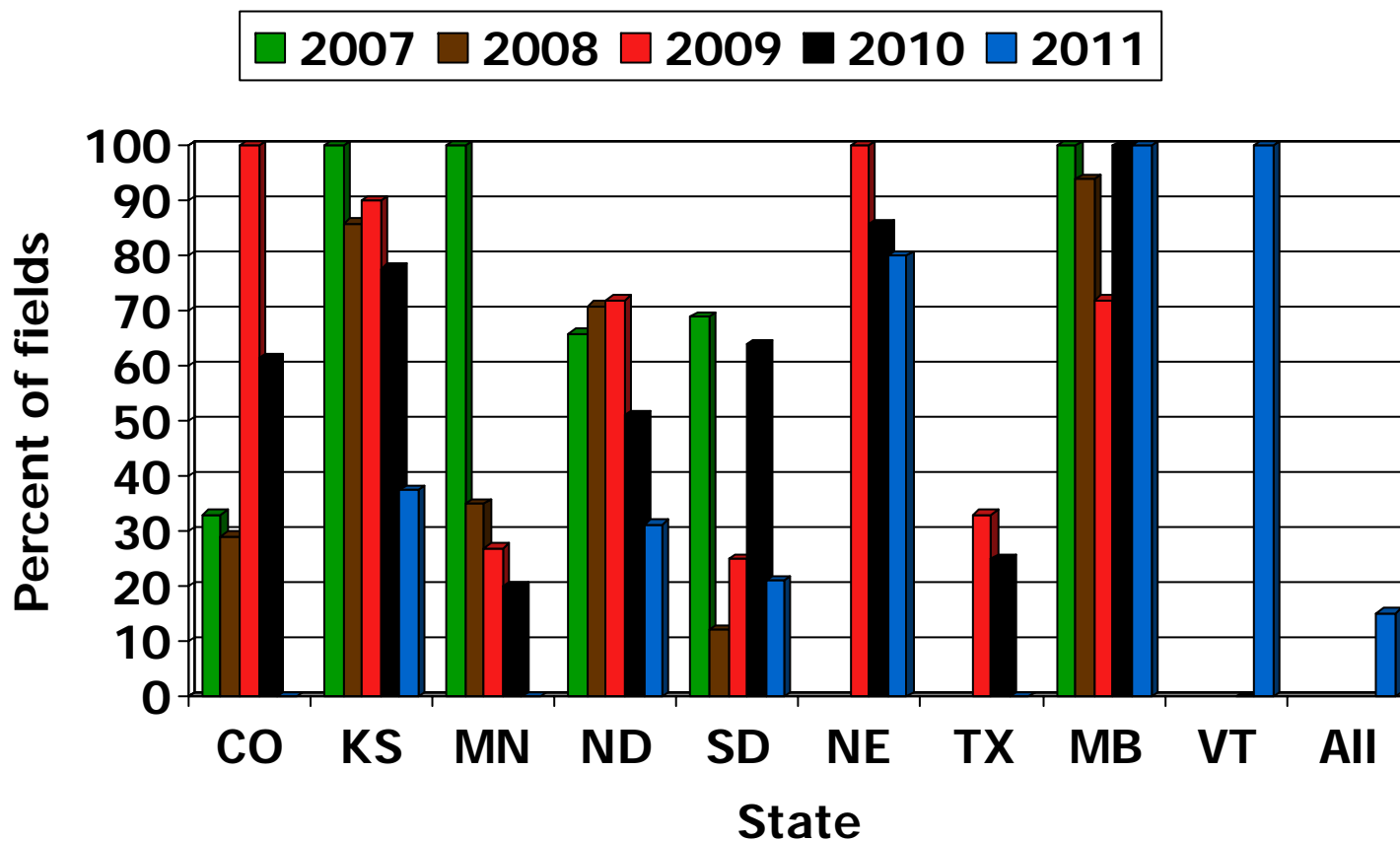


# Rust in Sunflower



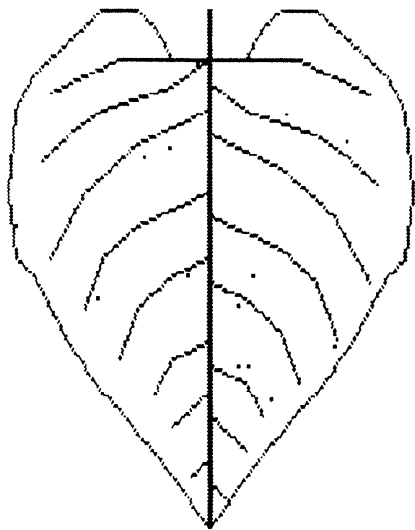


# Red Rust Incidence in Sunflower

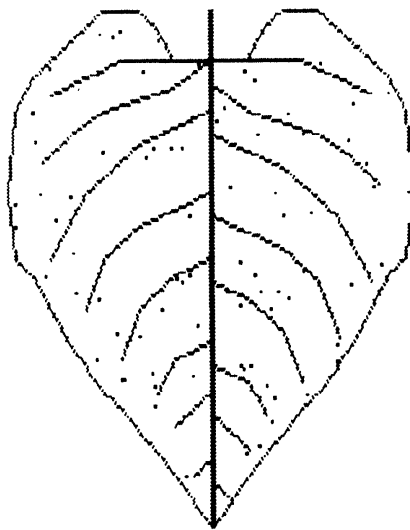


Rust Reported

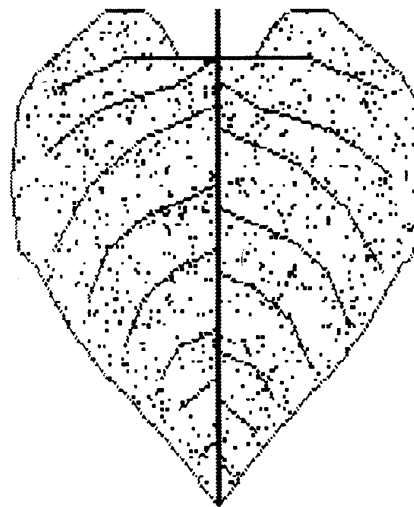
Instructions were examine upper 4 leaves on 5 consecutive plants and determine illustration that best fits average of all plants.



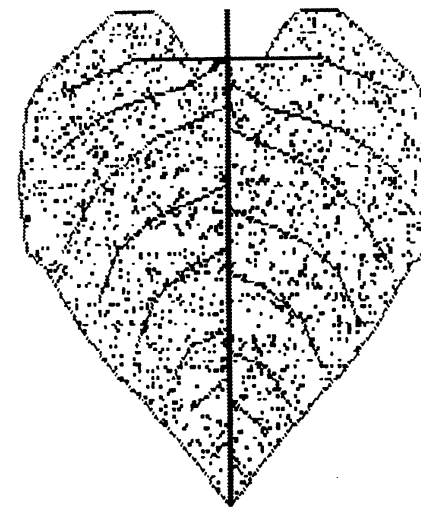
Leaf Area Affected .1%



Leaf Area Affected .5%

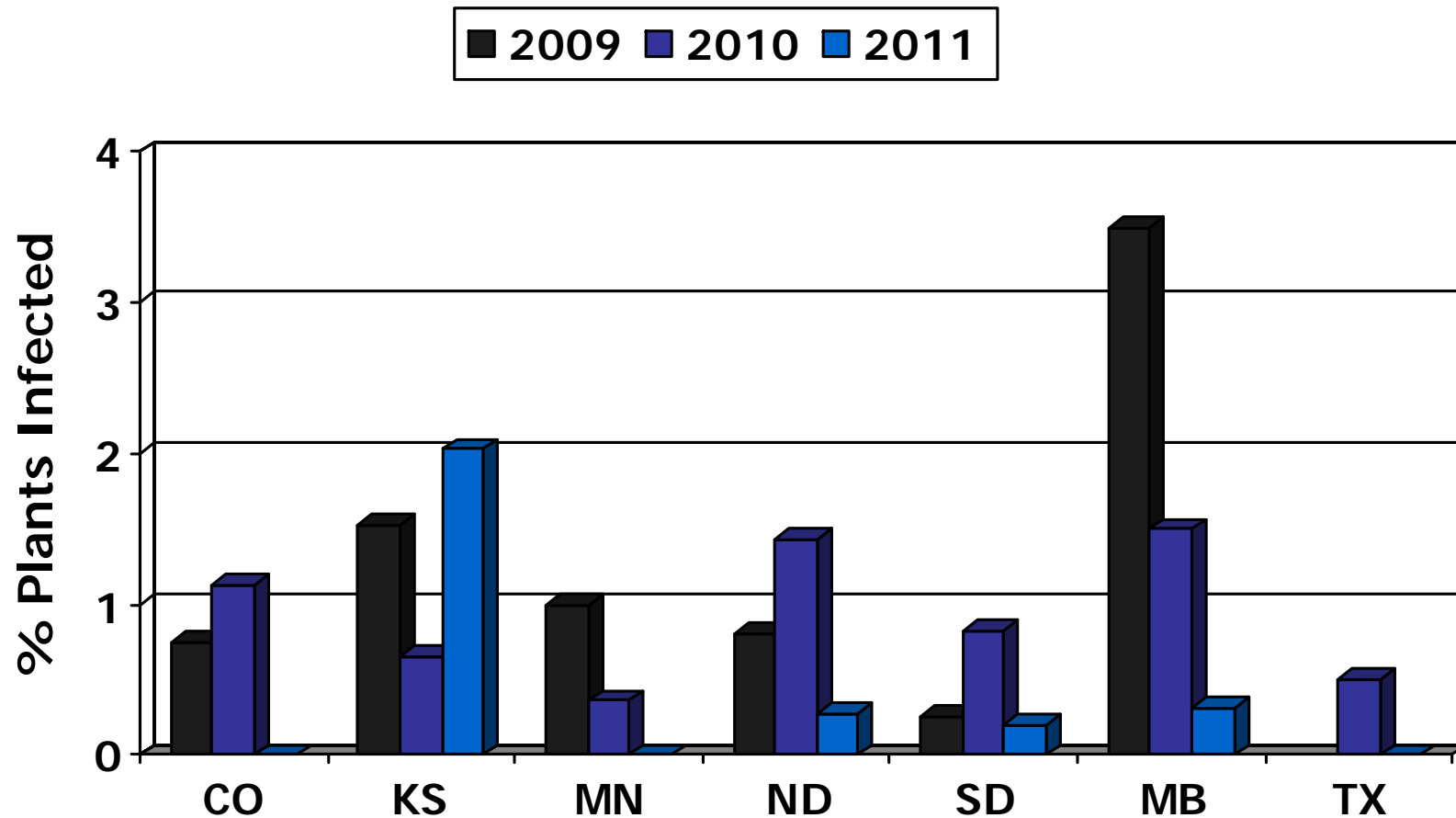


Leaf Area Affected 5%



Leaf Area Affected 10%

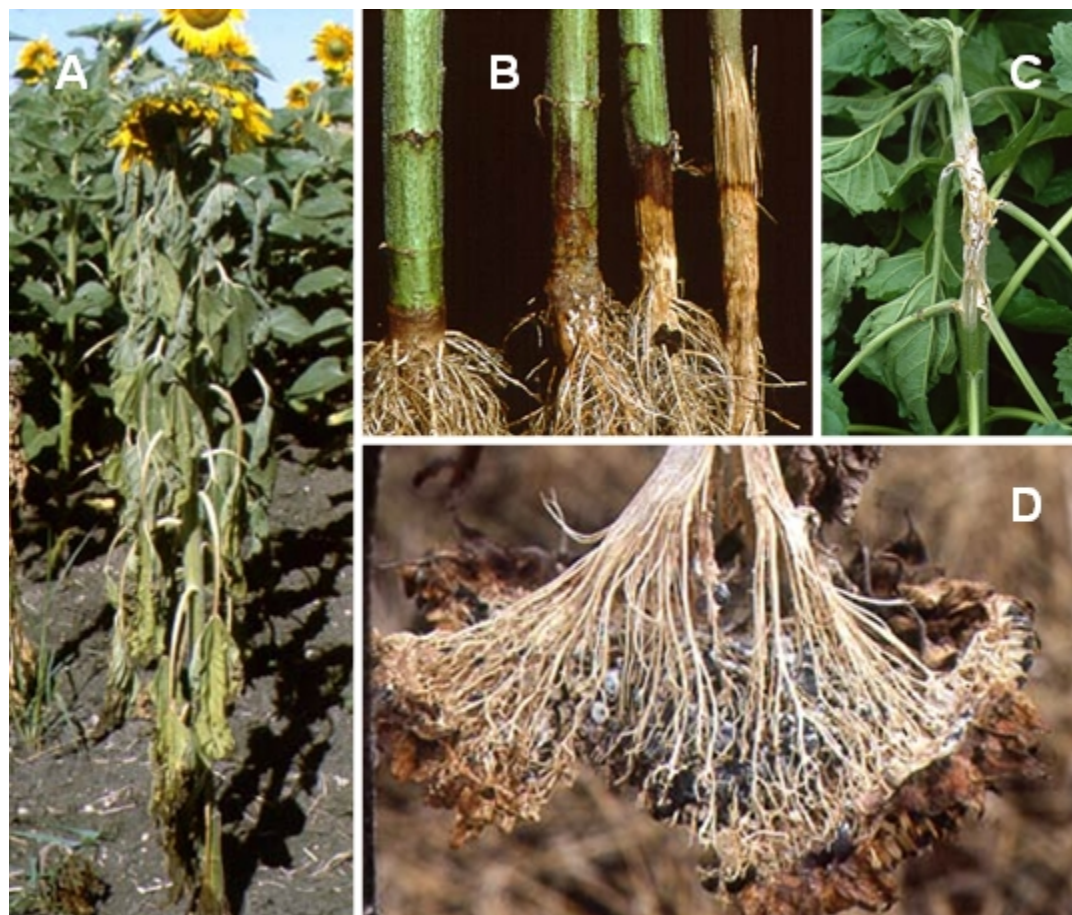
# Red Rust Severity in Sunflower



Rust Severity Estimated for Fields Where Incidence Reported



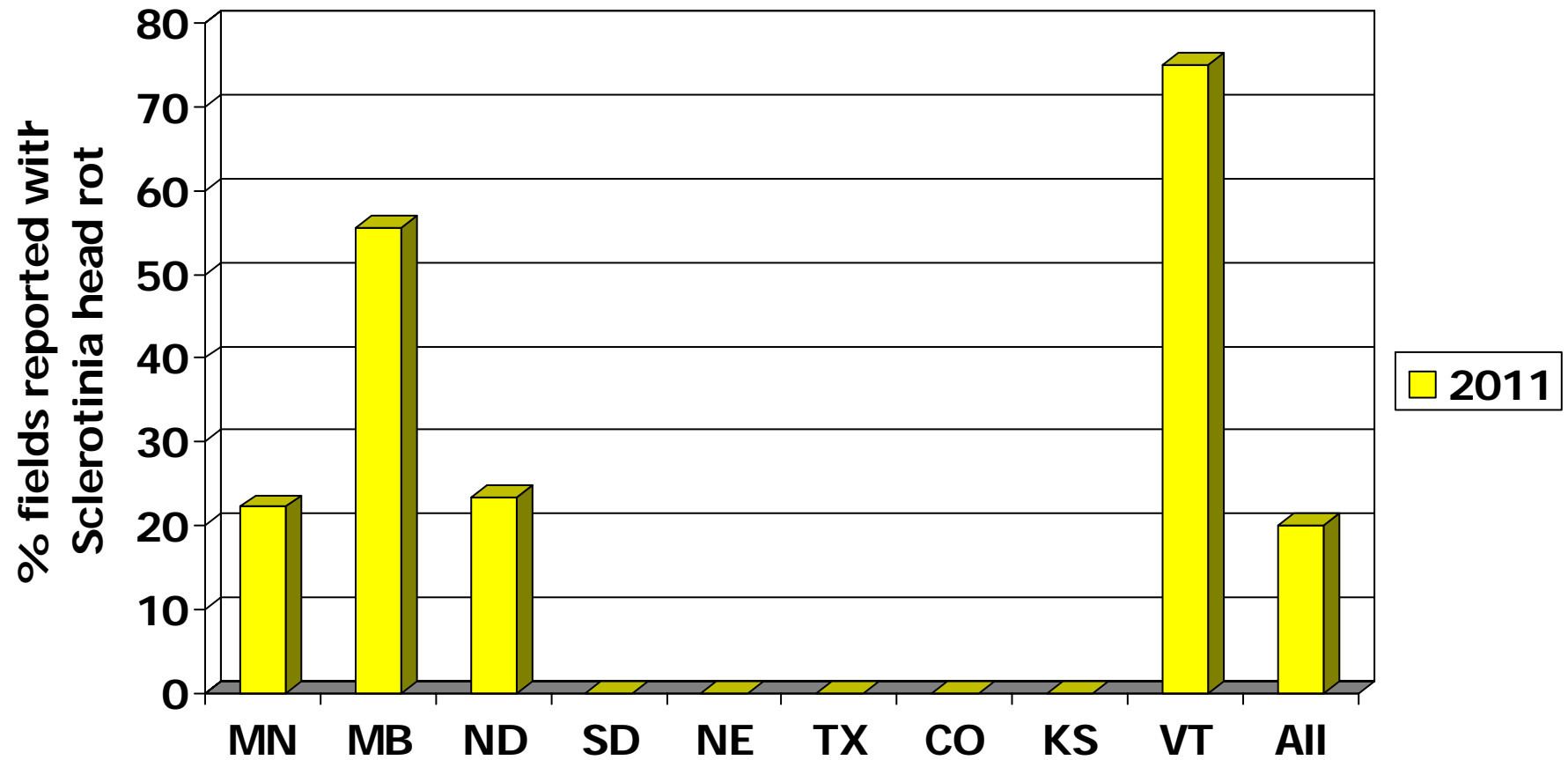
## Sclerotinia Head Rot



**Figure 1. Sclerotinia disease in sunflower expressed as sclerotinia wilt (A and B), mid-stalk rot (C), and head rot (D). Source: NDSU circular PP-840, March, 2000.**

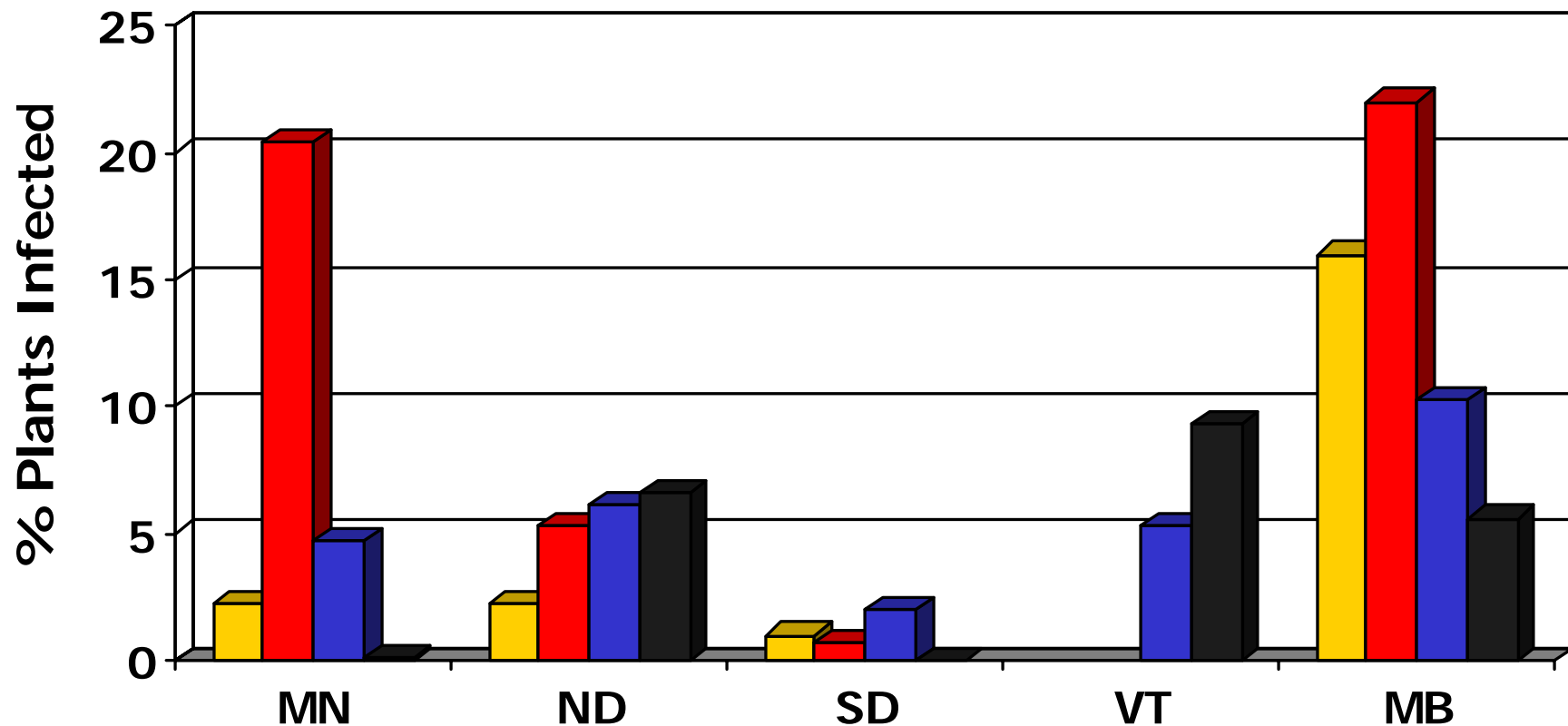


# Sclerotinia Head Rot Incidence in Sunflower 2011

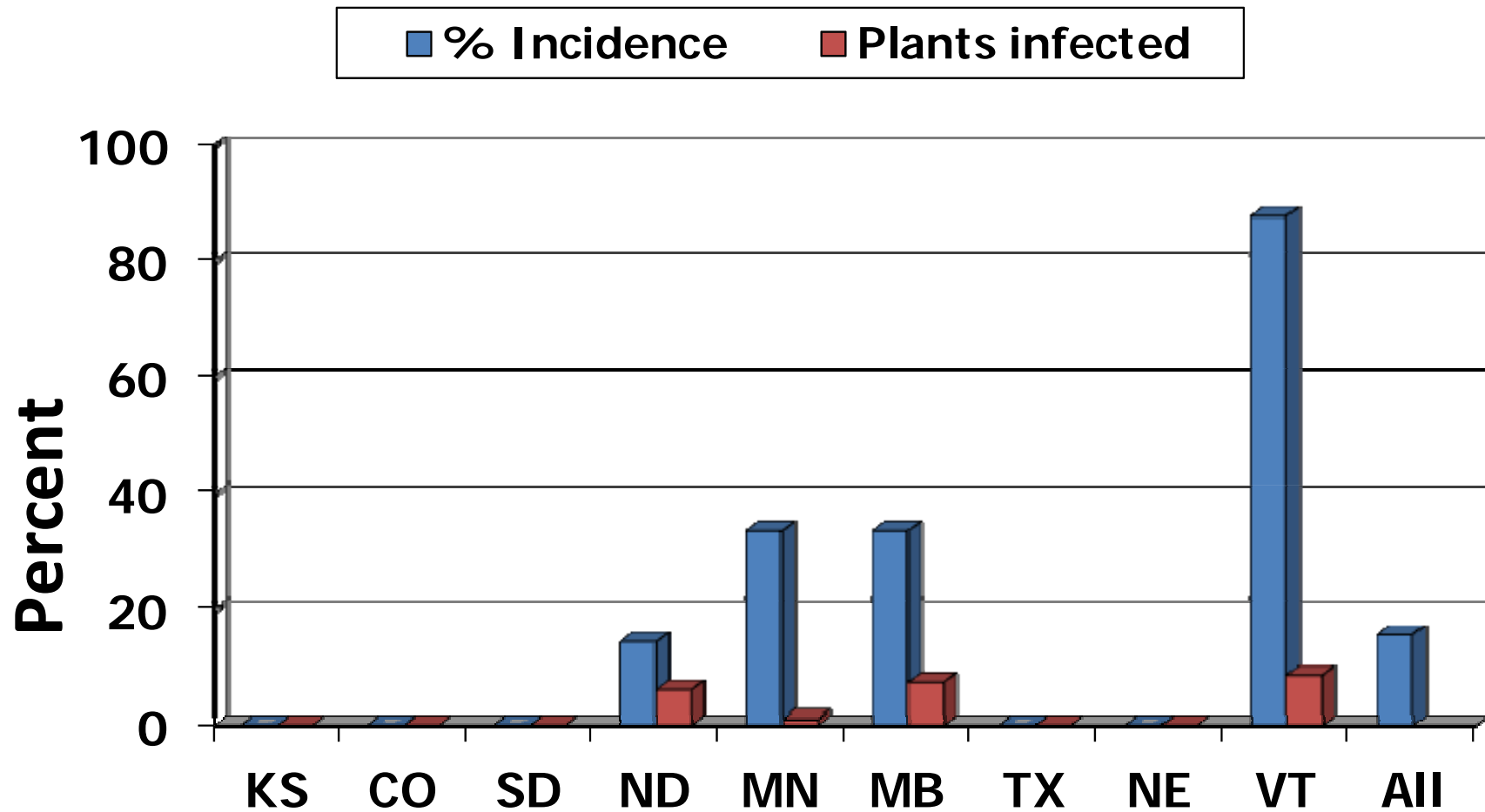


# Sclerotinia Head Rot Severity in Sunflower 2008 -2011

2008 2009 2010 2011



# Sclerotinia Stalk Rot Incidence and Severity in 2011



**Phomopsis Stem Canker**

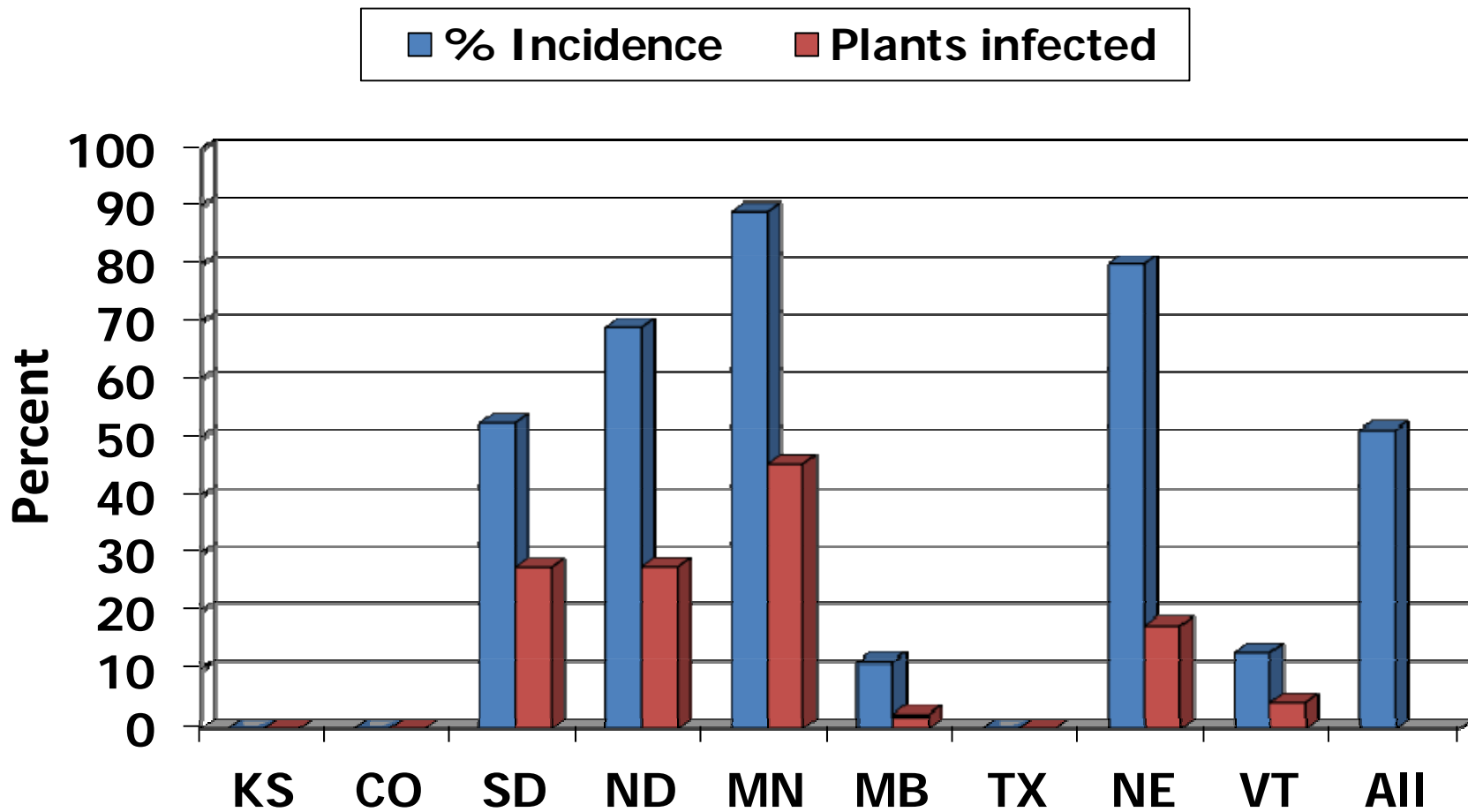


**Phoma**

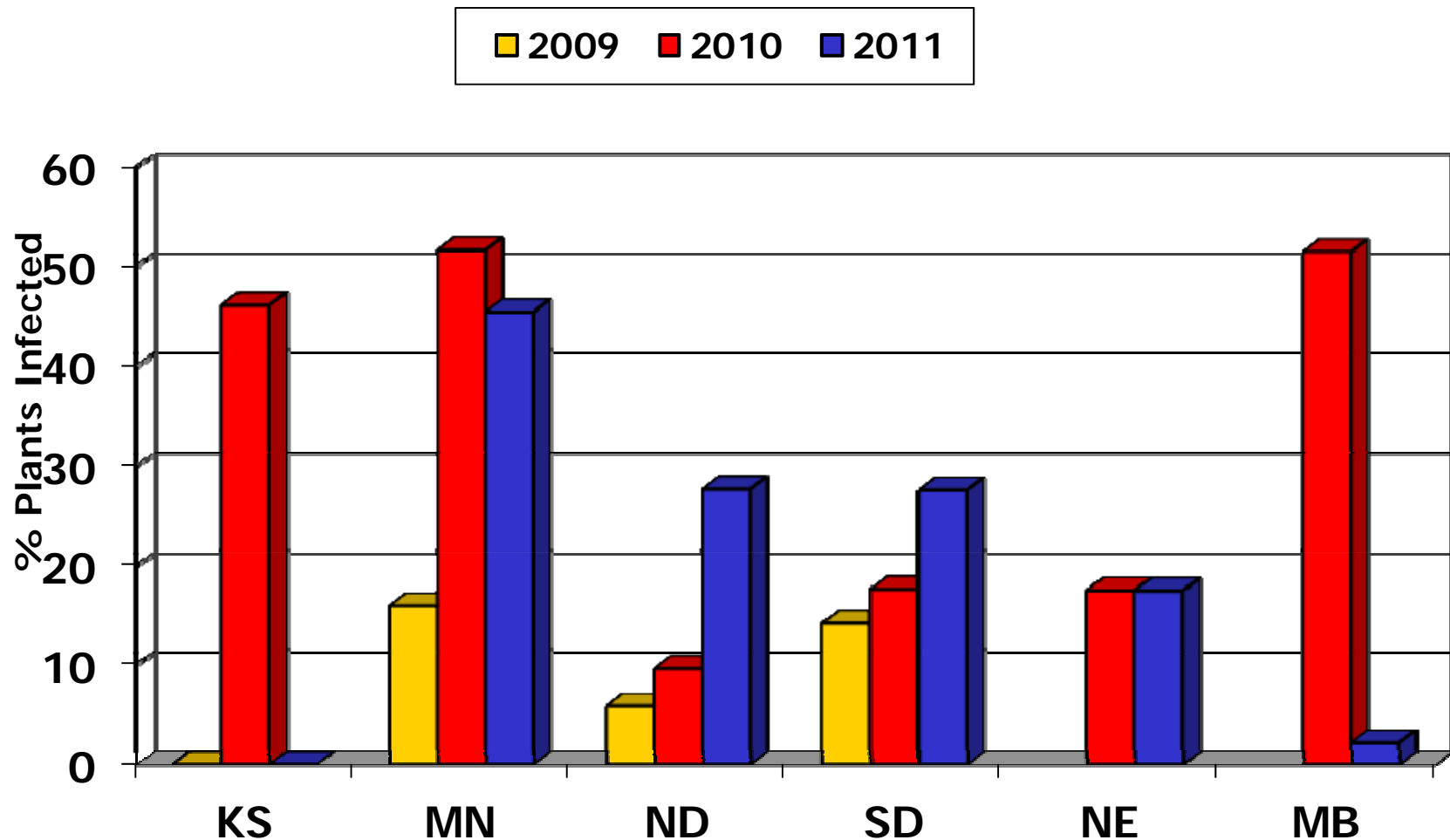




# Phomopsis Incidence and Severity in Sunflower 2011



# Phomopsis Severity in Sunflower 2009 -2011



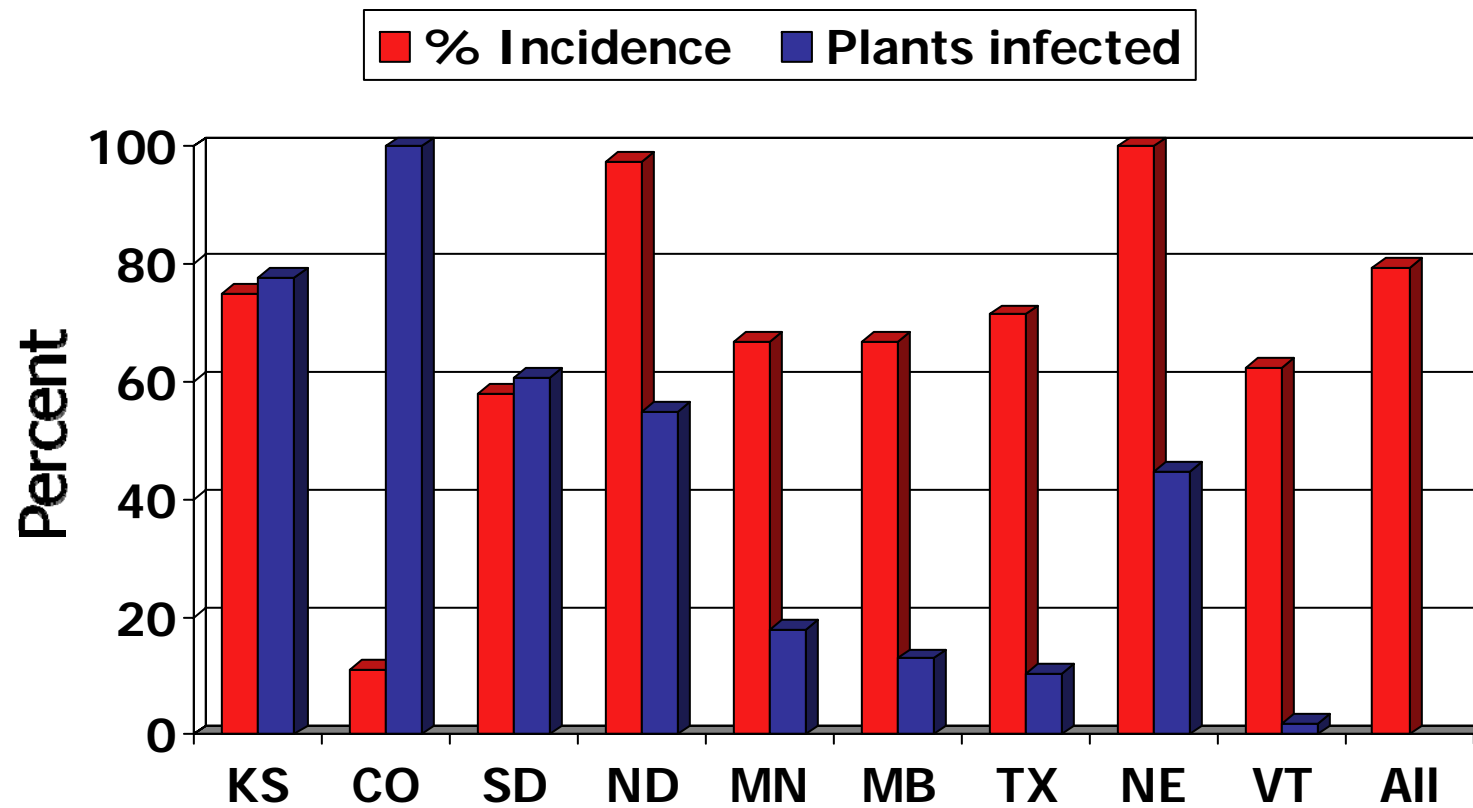
**Phomopsis Stem Canker**



**Phoma**

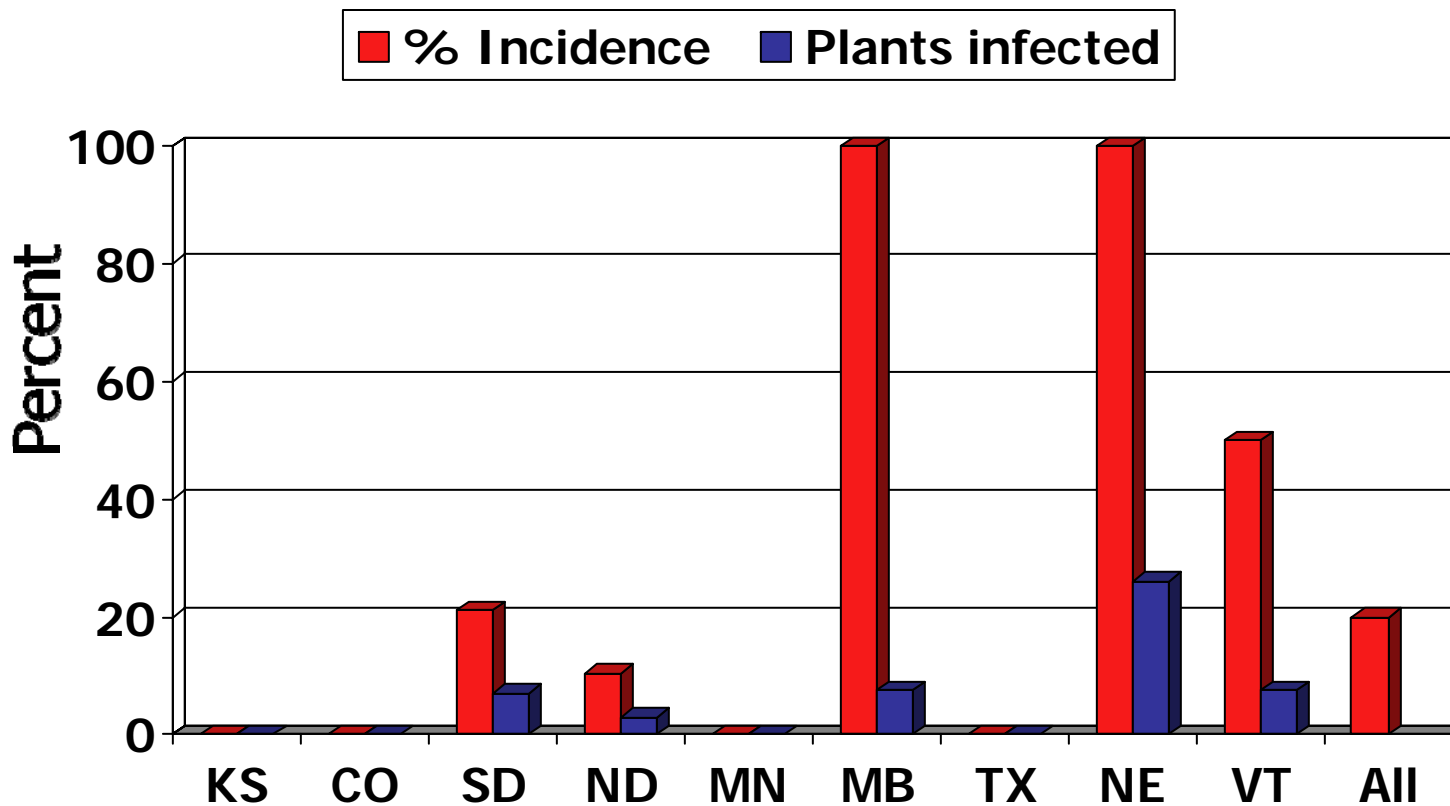


# Phoma Incidence and Severity in 2011

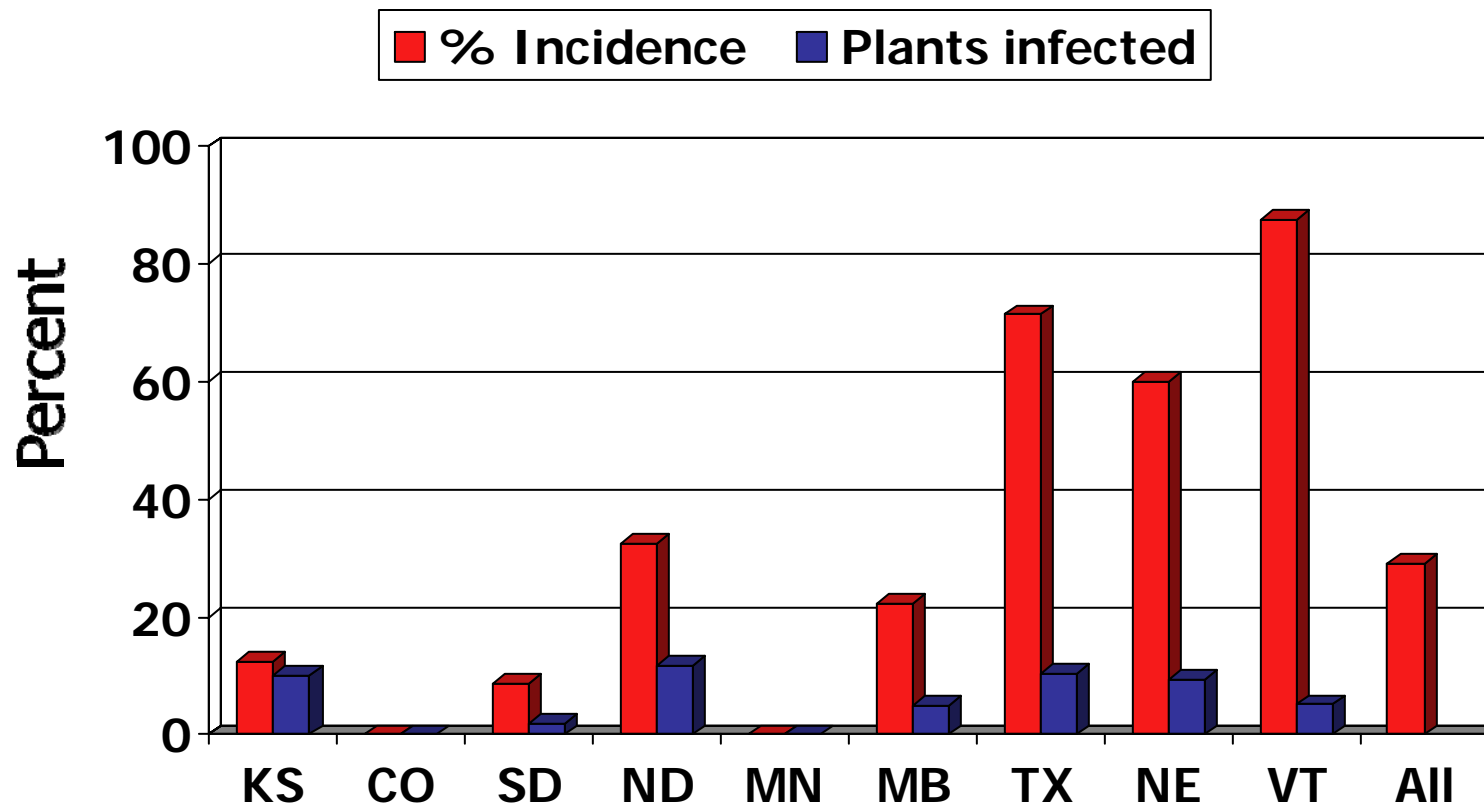




# Verticillium Incidence and Severity in 2011

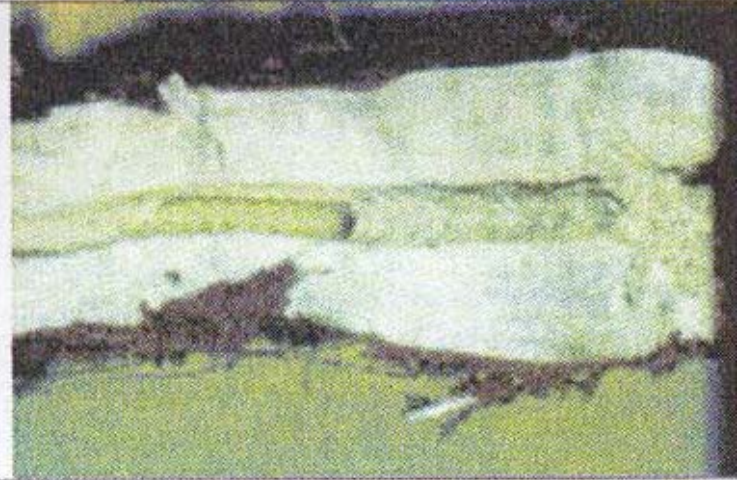
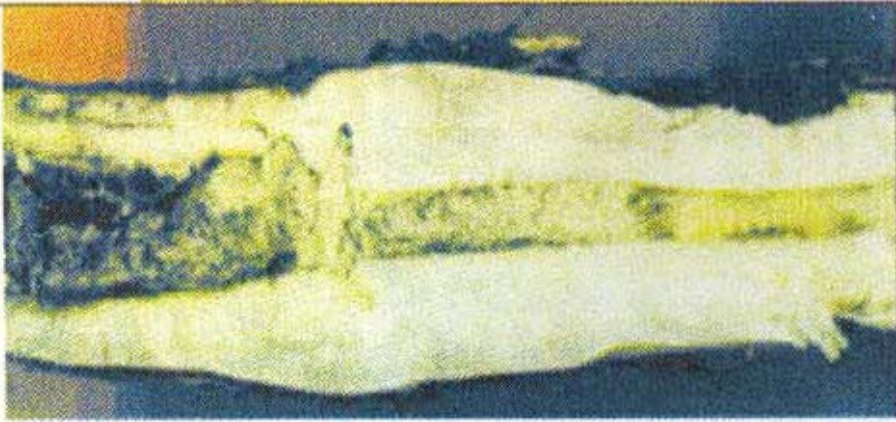


# Rhizopus Incidence and Severity in 2011

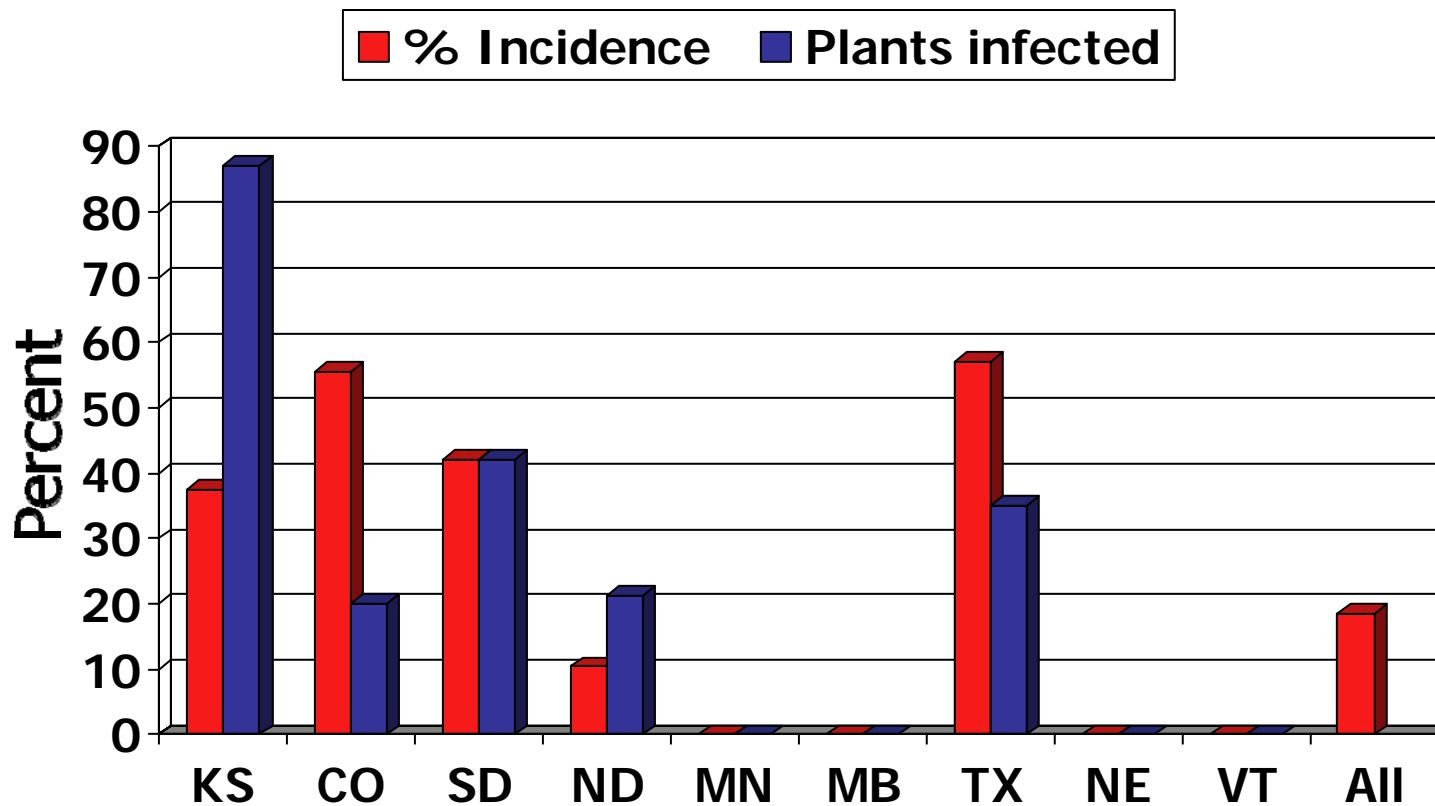


# Dectes

- Dectes (Long-horned Beetle)

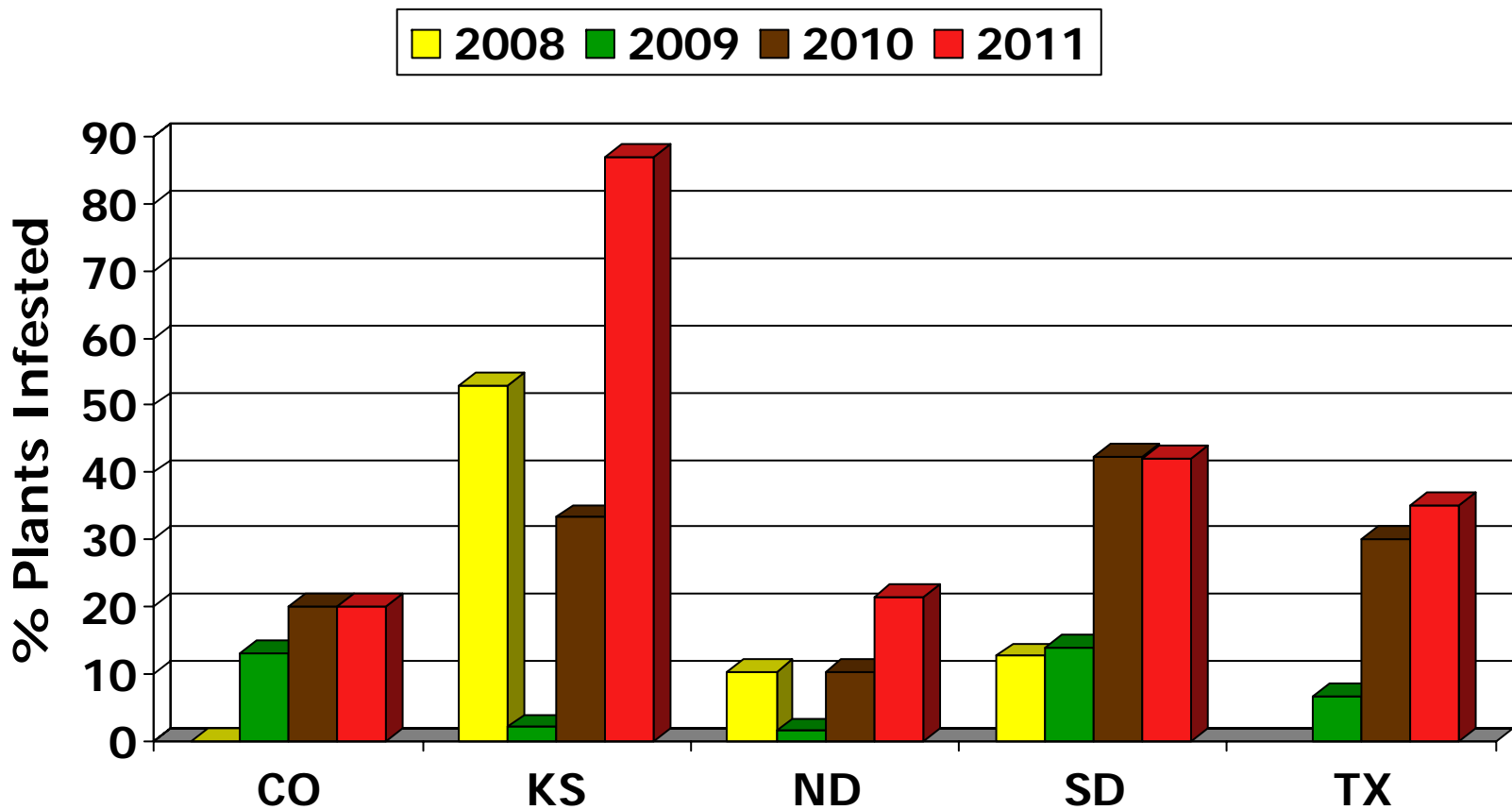


# Long Horned Beetle Incidence and Severity in 2011

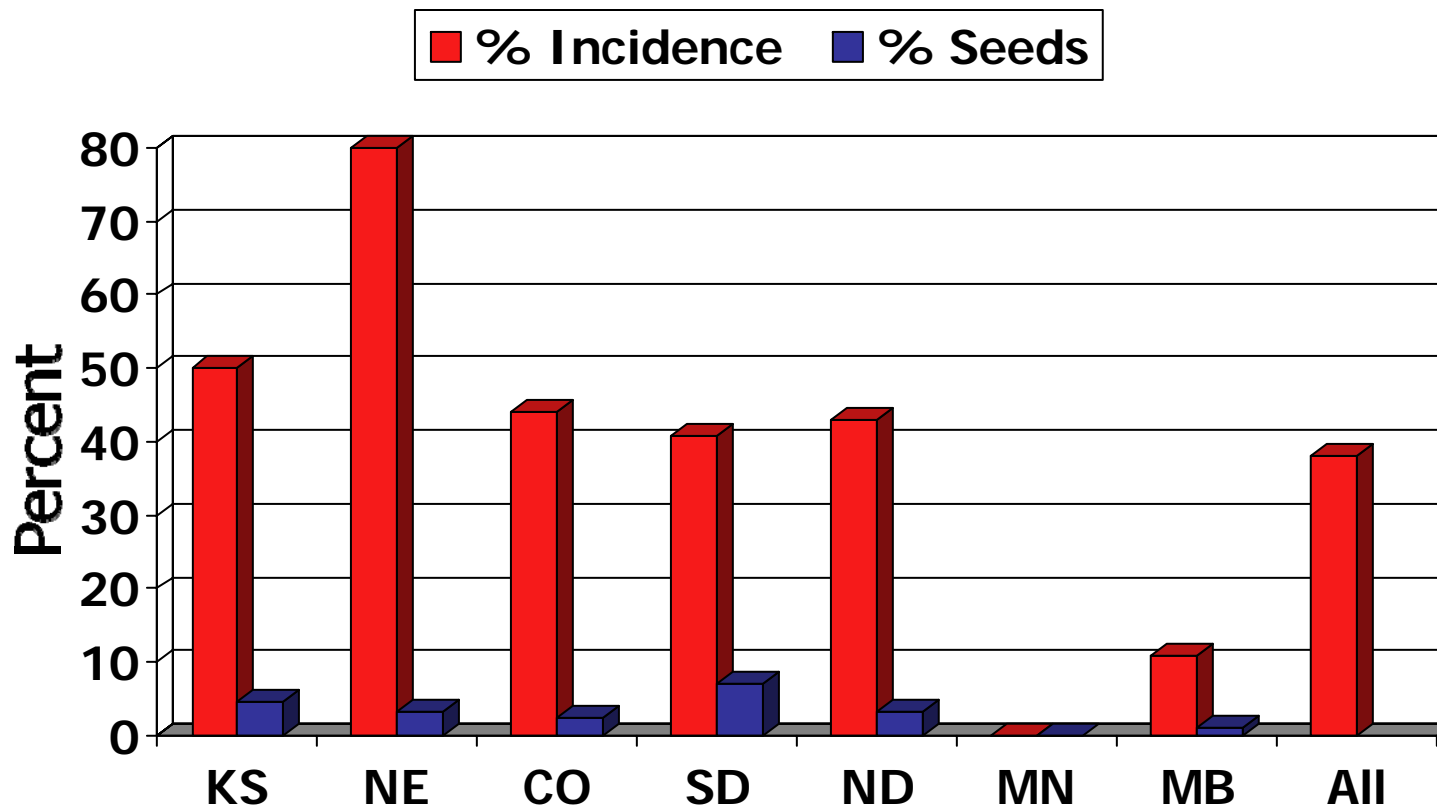




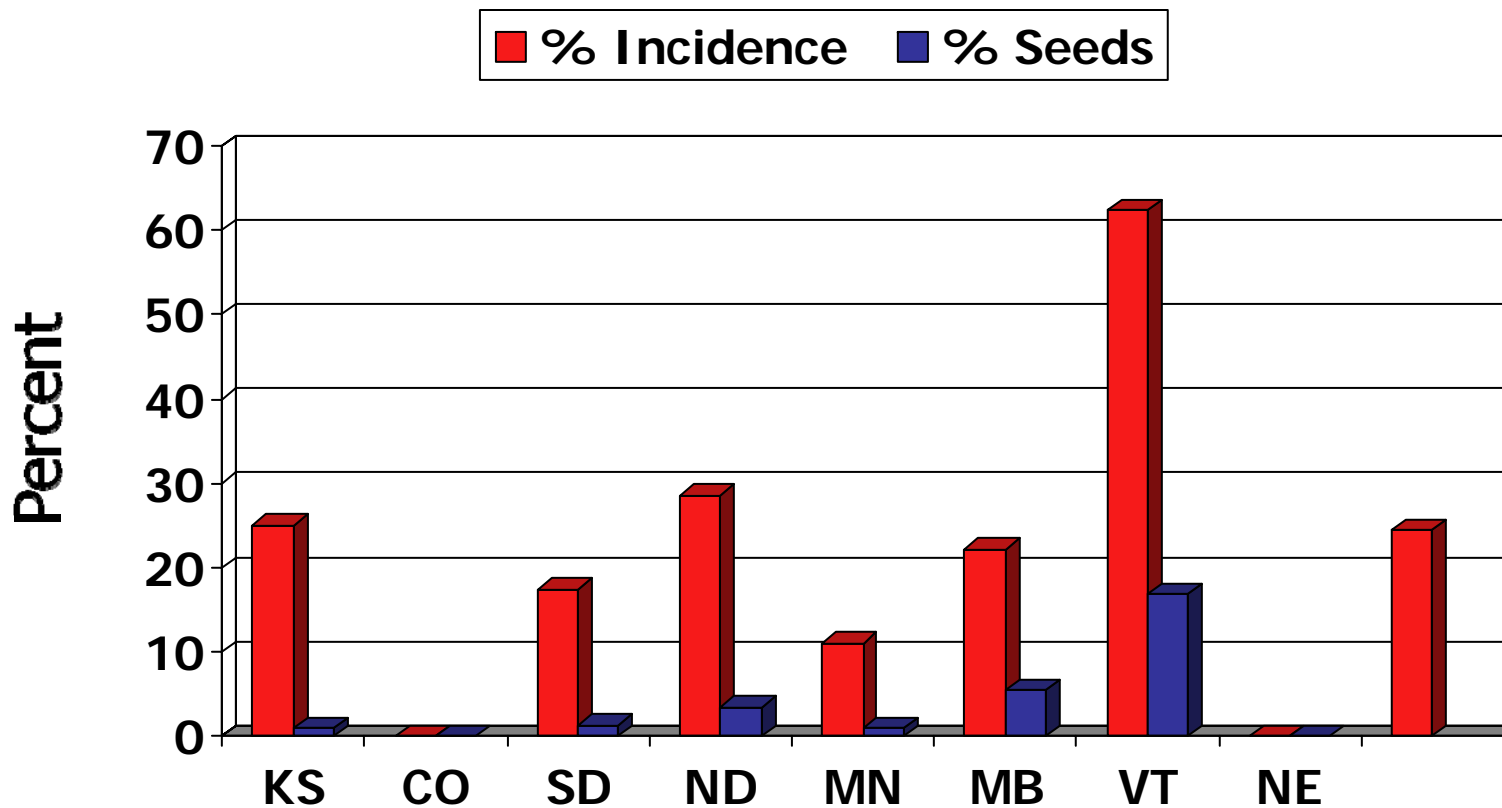
# Insect: Long Horned Beetle Severity 2008-2011



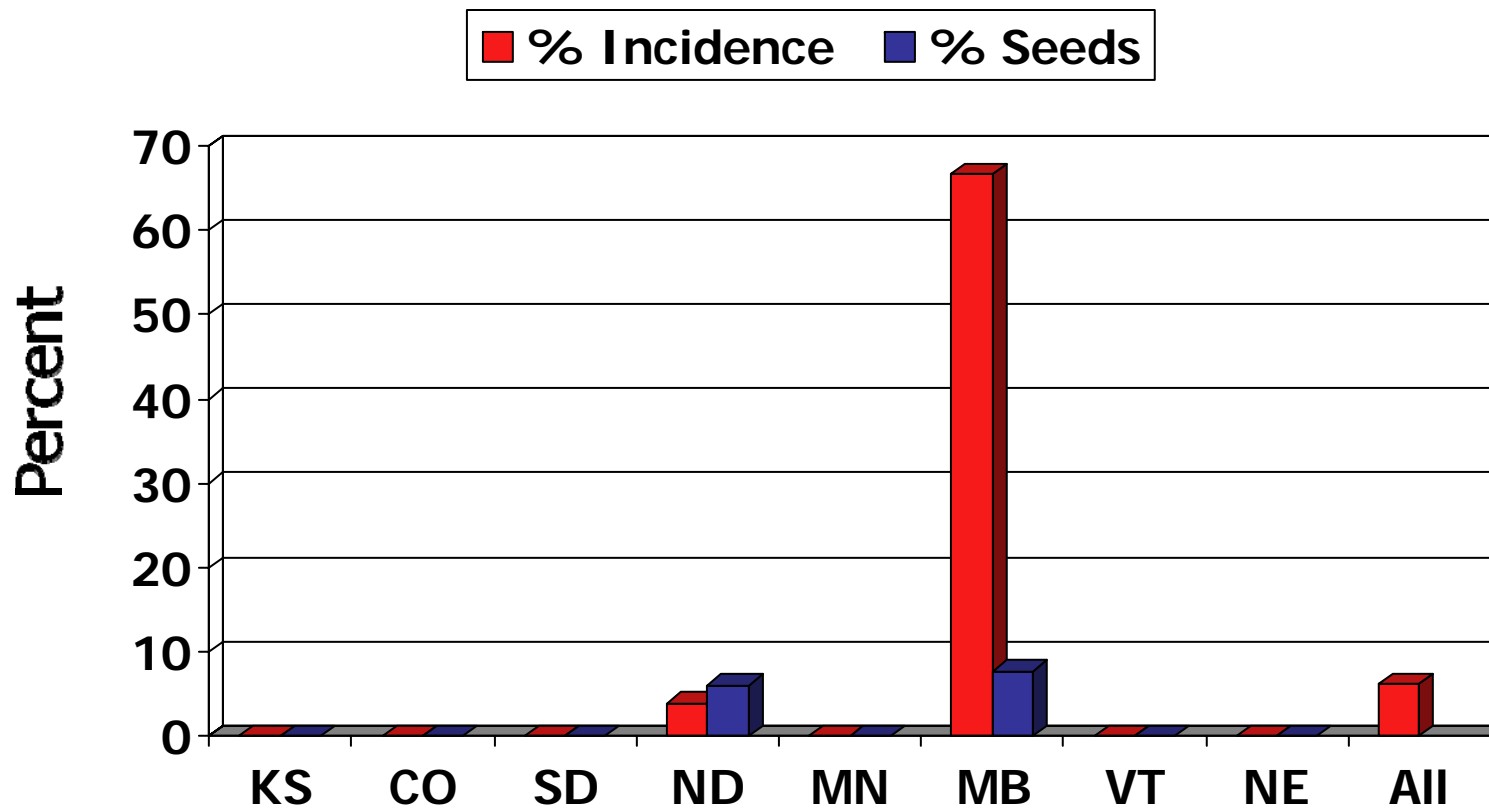
# Seed Weevil Incidence and Severity in 2011



# Banded Sunflower Moth Incidence and Severity in 2011

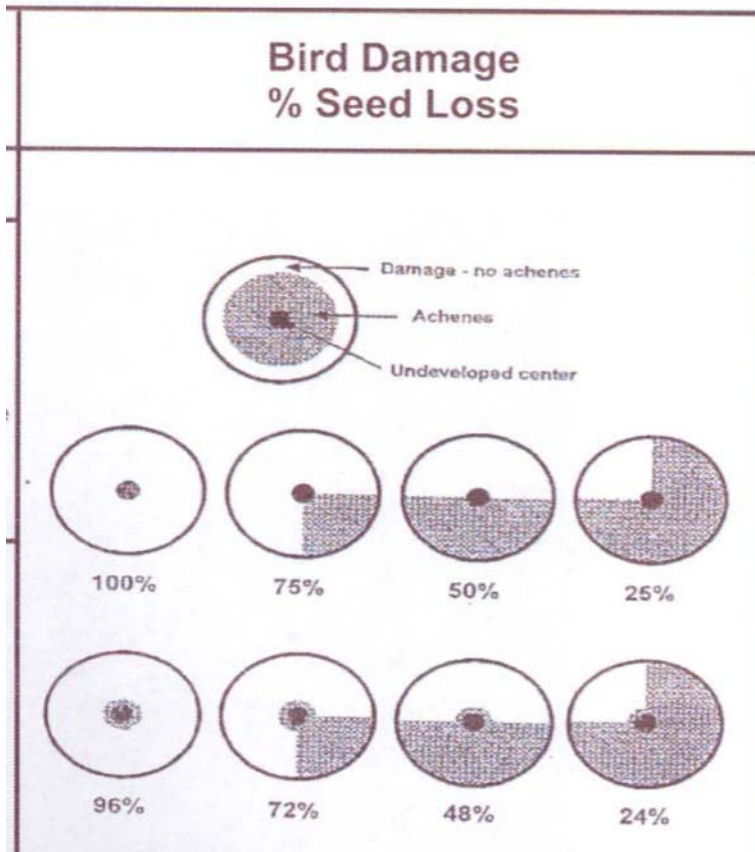


# Sunflower Moth Incidence and Severity in 2011

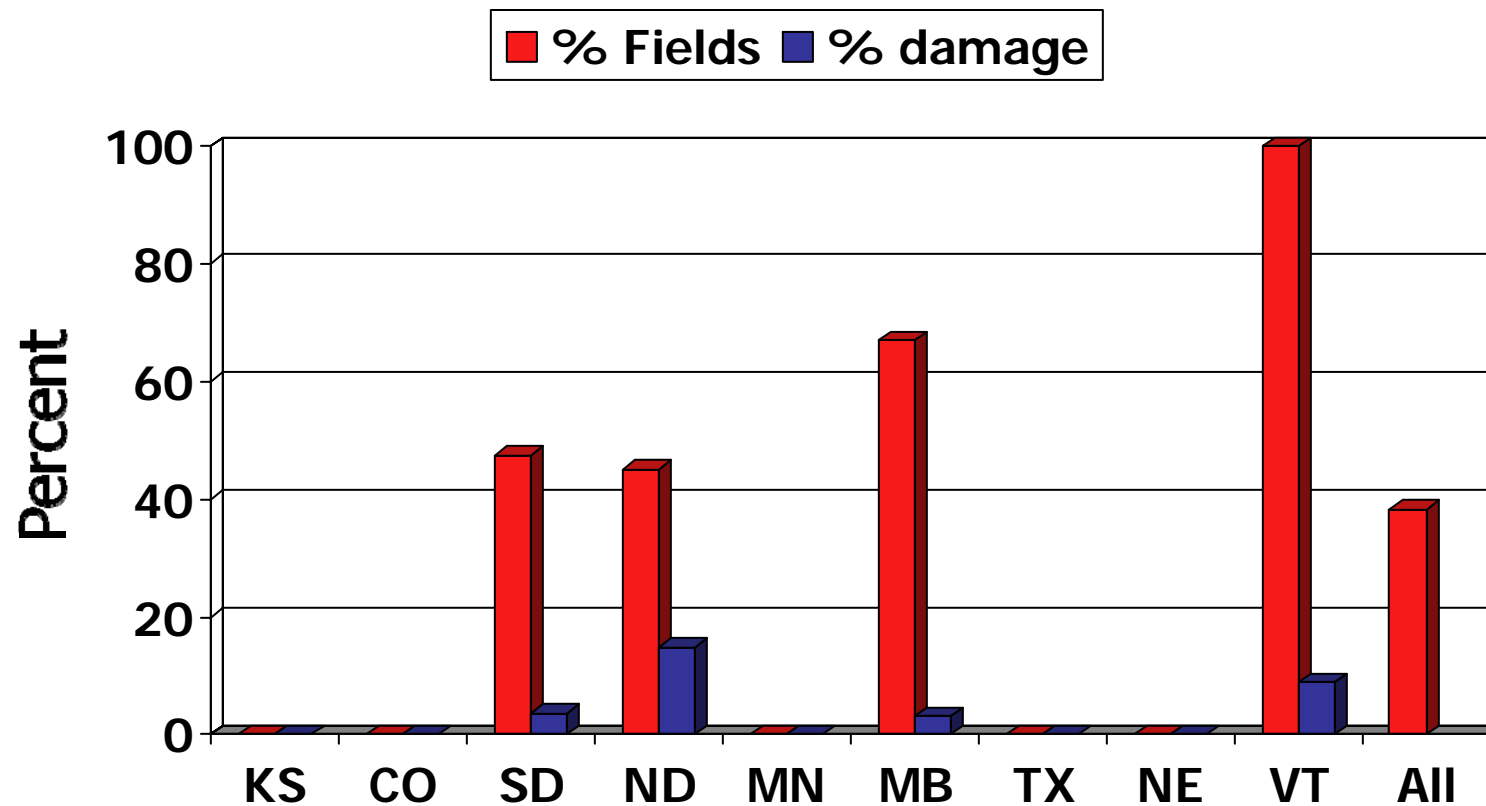




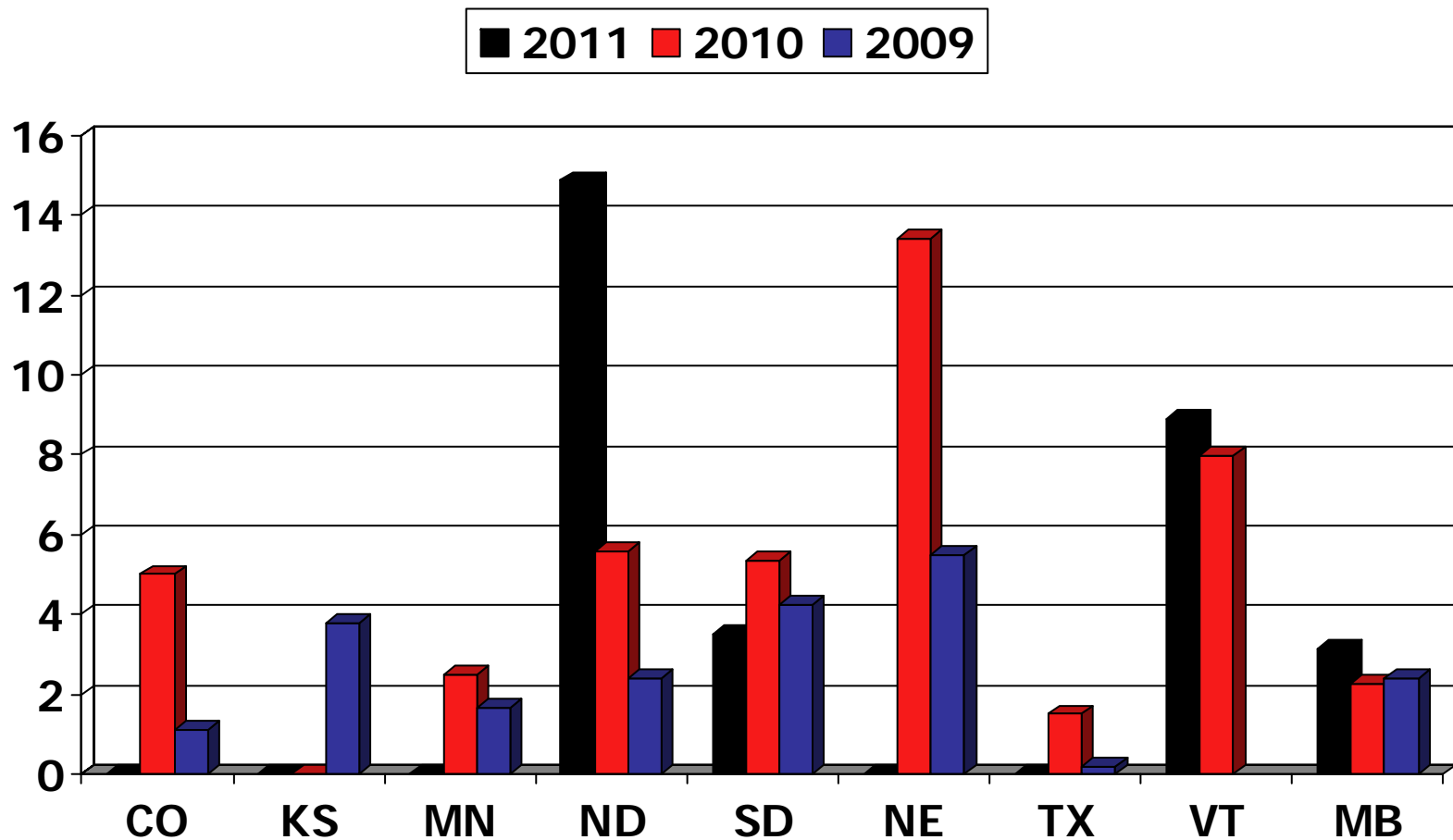
# Recording observations



# Bird Incidence and Severity in 2011



# %Bird Damage in Fields with Birds 2009-2011



# Top Weeds Observed: 2011

- **North Dakota**

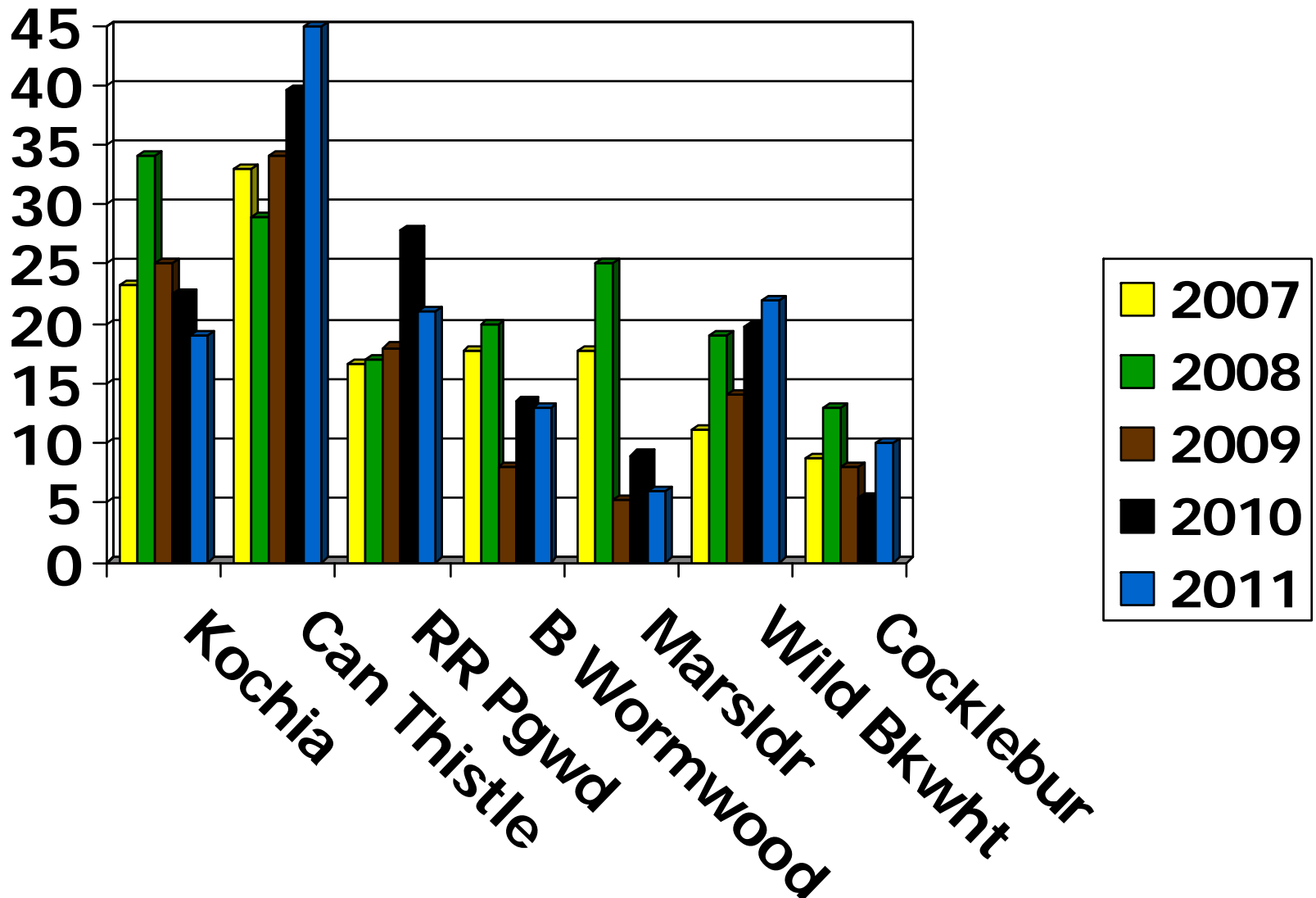
- Biennial Wormwood
- Canada Thistle
- Cockle Bur
- Lambsquarter
- Kochia
- Red root Pig Weed
- Wild buckwheat
- Wild mustard
- Foxtail

- **Minnesota**

- Smart weed
- Wormwood
- Canada Thistle
- Lambsquarter
- Russian Thistle

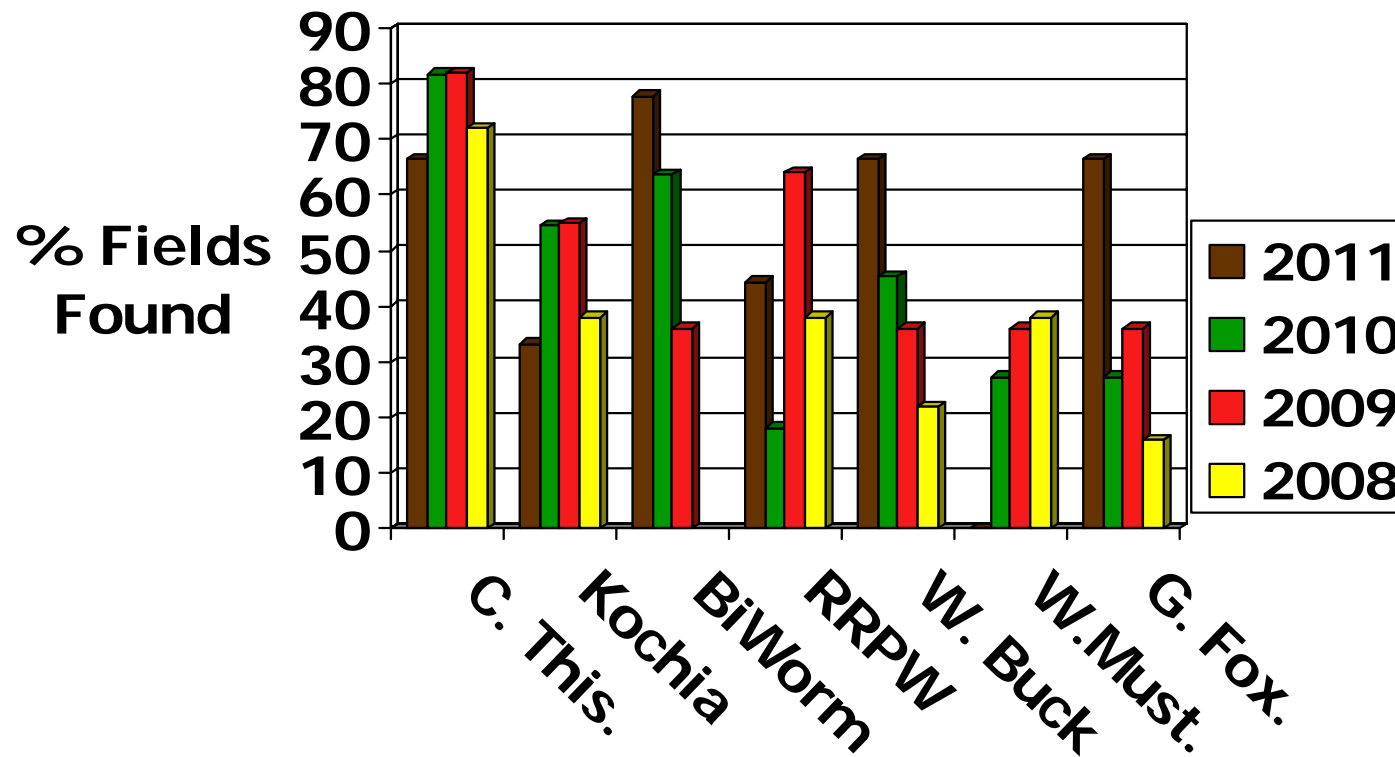


# Incidence of Broadleaf Weeds ND/MN 2007-2011

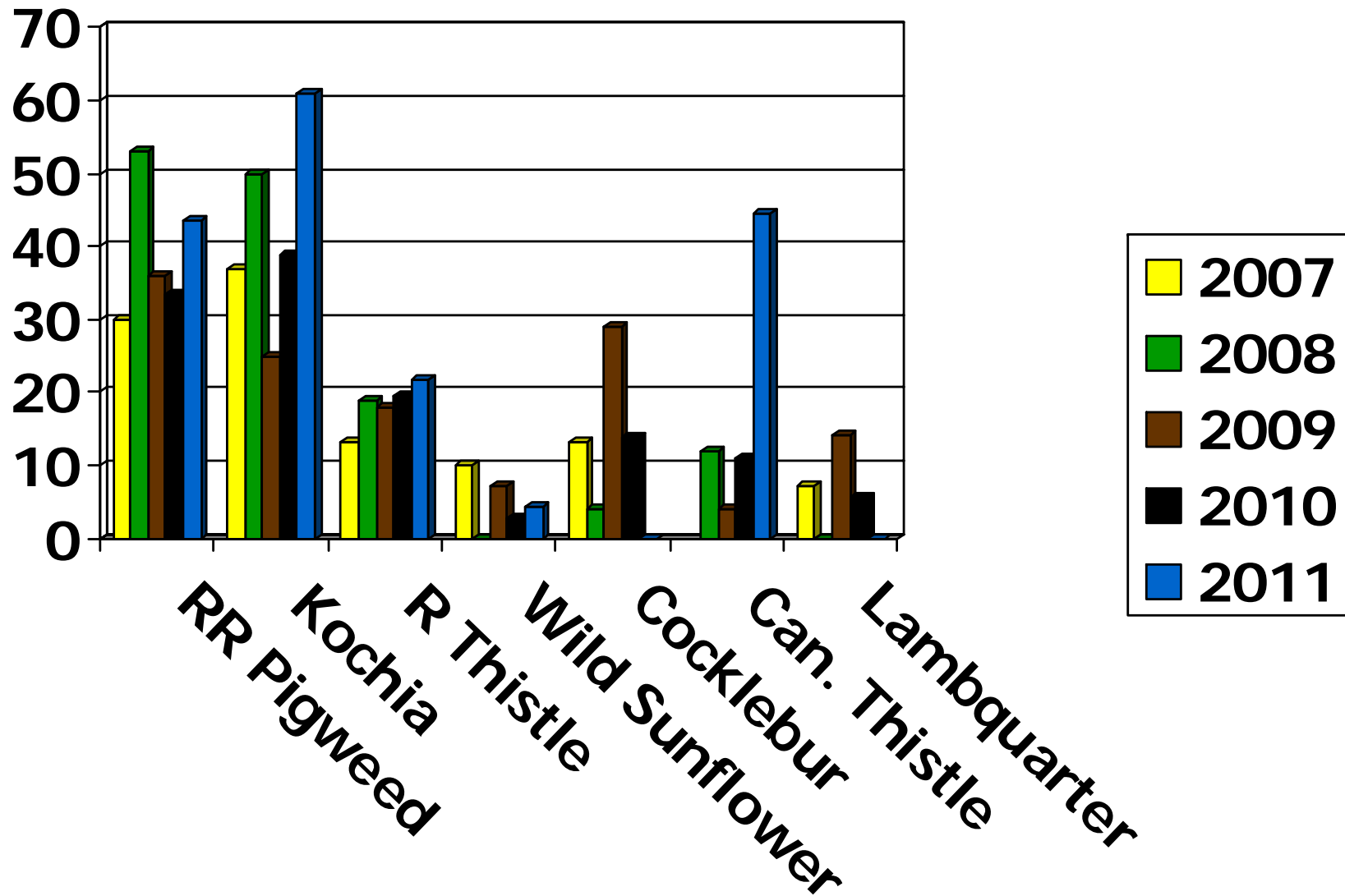




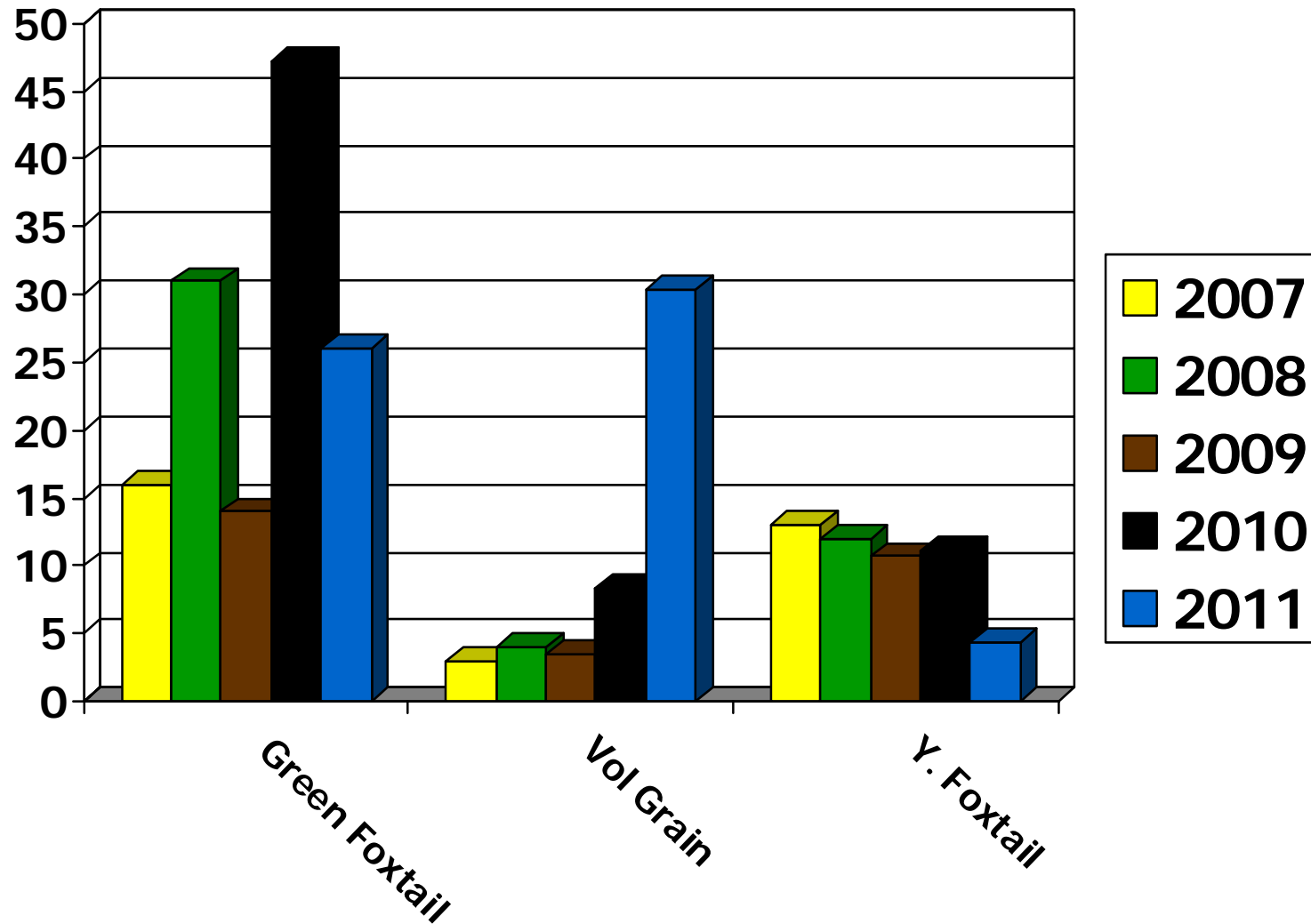
# Incidence of Weeds Observed in Manitoba 2008-2011



# Incidence of Broadleaf Weeds South Dakota 2007-2011



# Incidence of Grassy Weeds South Dakota 2007 - 2011



# Top Weeds Observed: 2011

- **Colorado weeds**

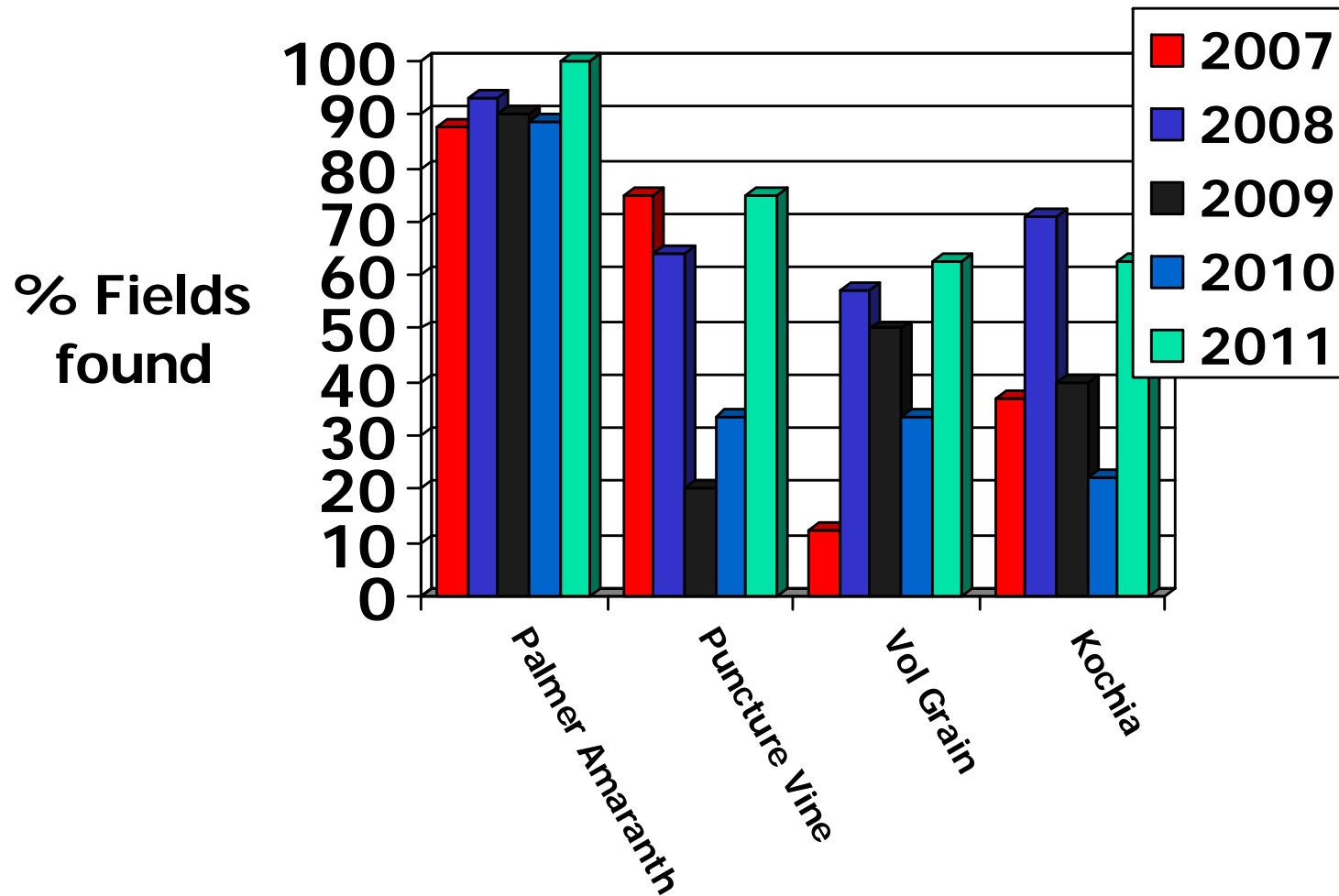
- Russian Thistle
- Kochia
- Puncture vine

- **Kansas Weeds**

- Palmer amaranth
- Puncture vine
- Red root pigweed
- Kochia

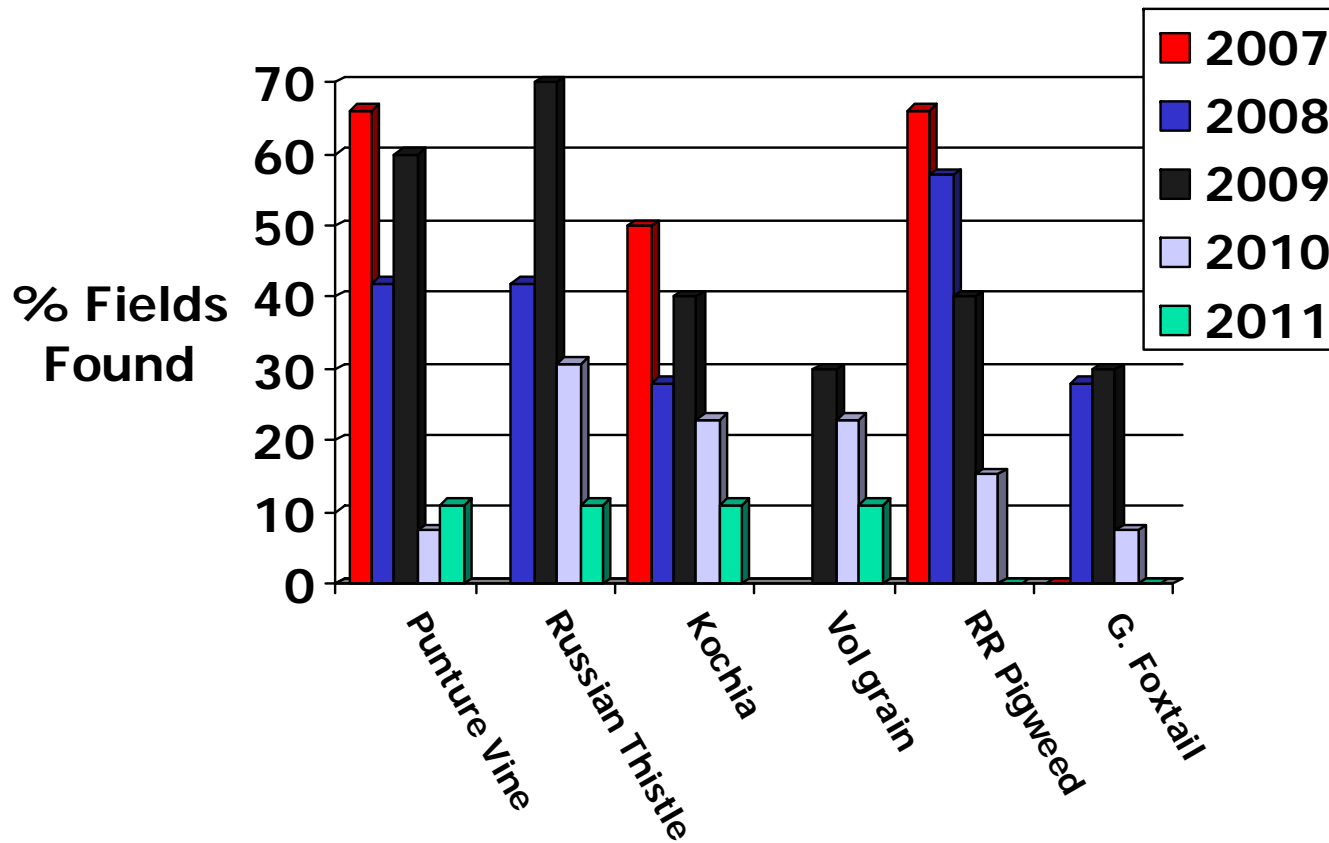


# Incidence of Weeds in Kansas

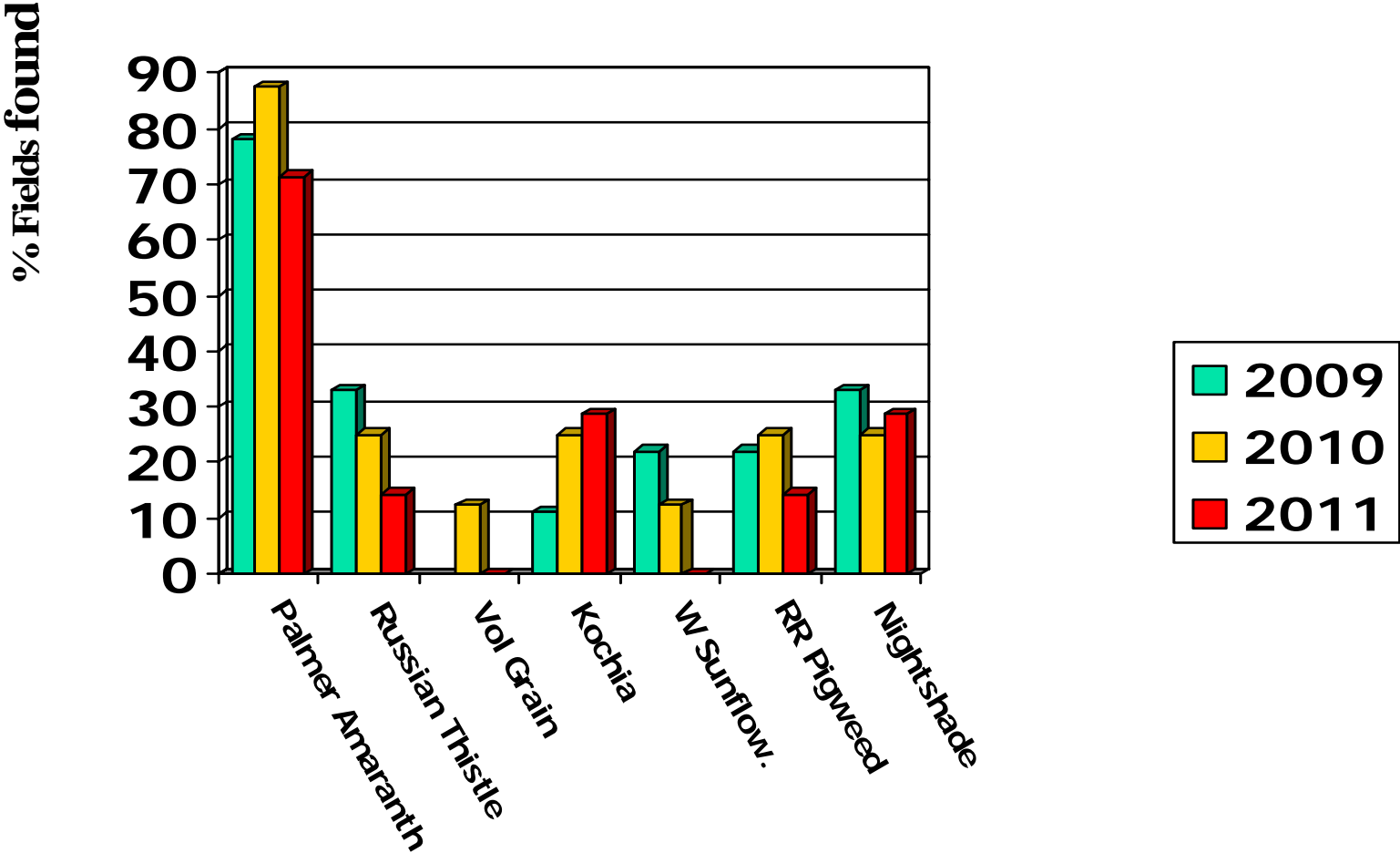




# Incidence of Weeds in Colorado 2007-2011



# Incidence of Weeds in Texas



# Conclusions and Summary of 2011 National Sunflower Survey

- Main yield limiting factors in the national survey were in order of importance: plant spacing within the row, diseases, lodging, weeds, drought, and bird damage.



# Conclusions and Summary of 2011 National Sunflower Survey

- Main yield limiting factors in ND were plant spacing (within the row), diseases, lodging and birds.
- Main yields limiting factors in SD were plant spacing, diseases and lodging.
- Main Yield limiting factors in Minnesota were diseases and a few fields with plant spacing within the row issues.



# Conclusions and Summary of 2011 National Sunflower Survey

- ND had the most sunflower planted in narrow row spacings.
- SD had 100% No-till seeding.
- ND had equal acres in No-till, Minimum-till and Conventional-till.





# Conclusions and Summary of 2011 National Sunflower Survey

- Rust incidence was high in Nebraska, Manitoba and Vermont.
- ND rust incidence was lower compared to the past 4 years.
- Rust incidence was also lower in Kansas, Minnesota and South Dakota compared with 2010.



# Conclusions and Summary of 2011 National Sunflower Survey

- Sclerotinia Head rot incidence was highest in Vermont and Manitoba.
- No Head rot was found in South Dakota, Nebraska, Texas, Colorado and Kansas.



# Conclusions and Summary of 2011 National Sunflower Survey

- Phomopsis incidence was high in North Dakota, Minnesota Nebraska, South Dakota and, Manitoba.
- Of the Phomopsis infected fields in Minnesota 45% of the plants had the disease.
- Phoma incidence ranged from 11% in Colorado to over 95 in % North Dakota and Colorado.



# Conclusions and Summary of 2011 National Sunflower Survey

- Verticillium incidence was reported in all surveyed fields in Manitoba and Nebraska.

*However the disease is not easy to diagnose and a better diagnostic approach may be needed than the current field observations*



# Conclusions and Summary of 2011 National Sunflower Survey

- Banded moth incidence was highest in Vermont followed by North Dakota, Kansas, Manitoba and South Dakota.
- Seed weevil incidence was highest in Nebraska followed by Kansas, Colorado, North and South Dakota.
- Sunflower moth incidence was most severe in Manitoba.





# Conclusions and Summary of 2011 National Sunflower Survey

- Long horned beetle with the highest percent severity was found in Kansas, followed by Texas and South Dakota.
- Bird Damage was reported in 100% of the Vermont fields surveyed, followed by 67% in Manitoba, 46% in North Dakota and 39% in South Dakota.



# Conclusions and Summary of 2011 National Sunflower Survey

- Broadleaf weeds continue to be more of a problem than most grassy weed species.
- Palmer Amaranth is a major problem weed in Kansas and was recorded as being present in 100% of the surveyed fields.
- Palmer Amaranth was found in 71% of the Texas fields.



A wide-angle photograph of a sunflower field. The sunflowers are in full bloom, with bright yellow petals and dark brown centers. The field stretches to the horizon under a clear, light blue sky. A small bird is visible in flight on the left side of the sky.

*2011 Sunflower Survey  
Sponsored by the National  
Sunflower Association*