

# Raising Non-Rotation Soybean

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*UW MADISON AGRONOMY*

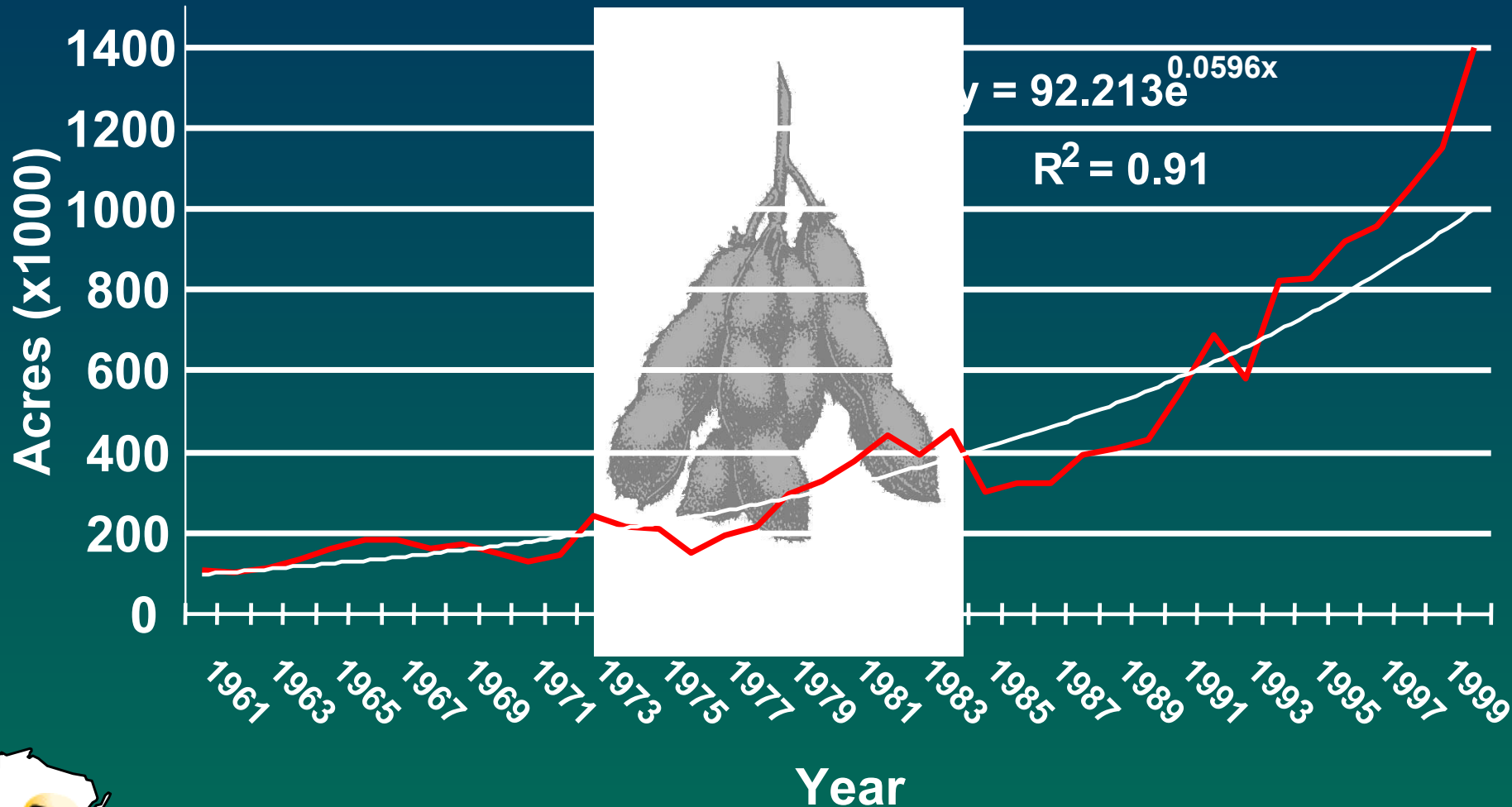
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# Background

- **At least 95% of the soybean crop is grown in rotation**
- **Higher demand in 2001**
  - **An expected increase in acreage**
  - **Lower input costs compared to corn**



# Wisconsin Soybean Acreage 1961 to 2000



# Crop Rotation

*“A cropping sequence on a particular field that includes more than one crop over a particular period of years”*



# Crop Rotation

- **Benefits have been known for several years**
  - **Reduced pest and pathogen populations**
  - **Nutrient benefits**
  - **Improved soil structure**
  - **Increase density and activity of beneficial microorganisms**
  - **Allelopathy effects**



# Crop Rotation

...the “rotation effect” is still not fully understood



# Diaporthe - Phomopsis Complex

**Brown Stem Rot**



**Sudden Death Syndrome**



**Unknown**

**Virus**

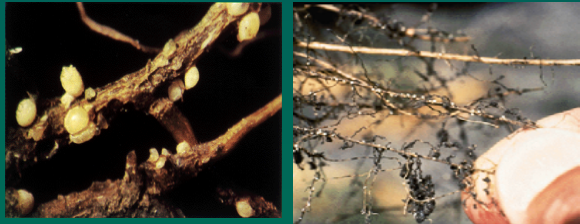


**Green Stem**



**White Mold**

**Soybean Cyst Nematode**



**Soil pH**



**Nutrients**



**Phytophthora**

**Organic matter**



# Objective

*To determine the rotation effect on corn and soybean and its interaction with tillage system and row spacing*





# Material and Methods

- **From 1998 to 2000 at UW - Arlington ARS**
- **AG 2301 (moderate resistant BSR variety)**
- **A RCB in a split-split arrangement with 4 replications**
  - **Two tillage systems (no-till vs. conventional tillage)**



# Material and Methods

- **Rotation sequences (since 1986)**
  - 1<sup>st</sup> year soybean
  - 2<sup>nd</sup> year soybean
  - 3<sup>rd</sup> year soybean
  - 4<sup>th</sup> year soybean
  - 5<sup>th</sup> year soybean
  - Corn/soybean rotation
  - Continuous soybean

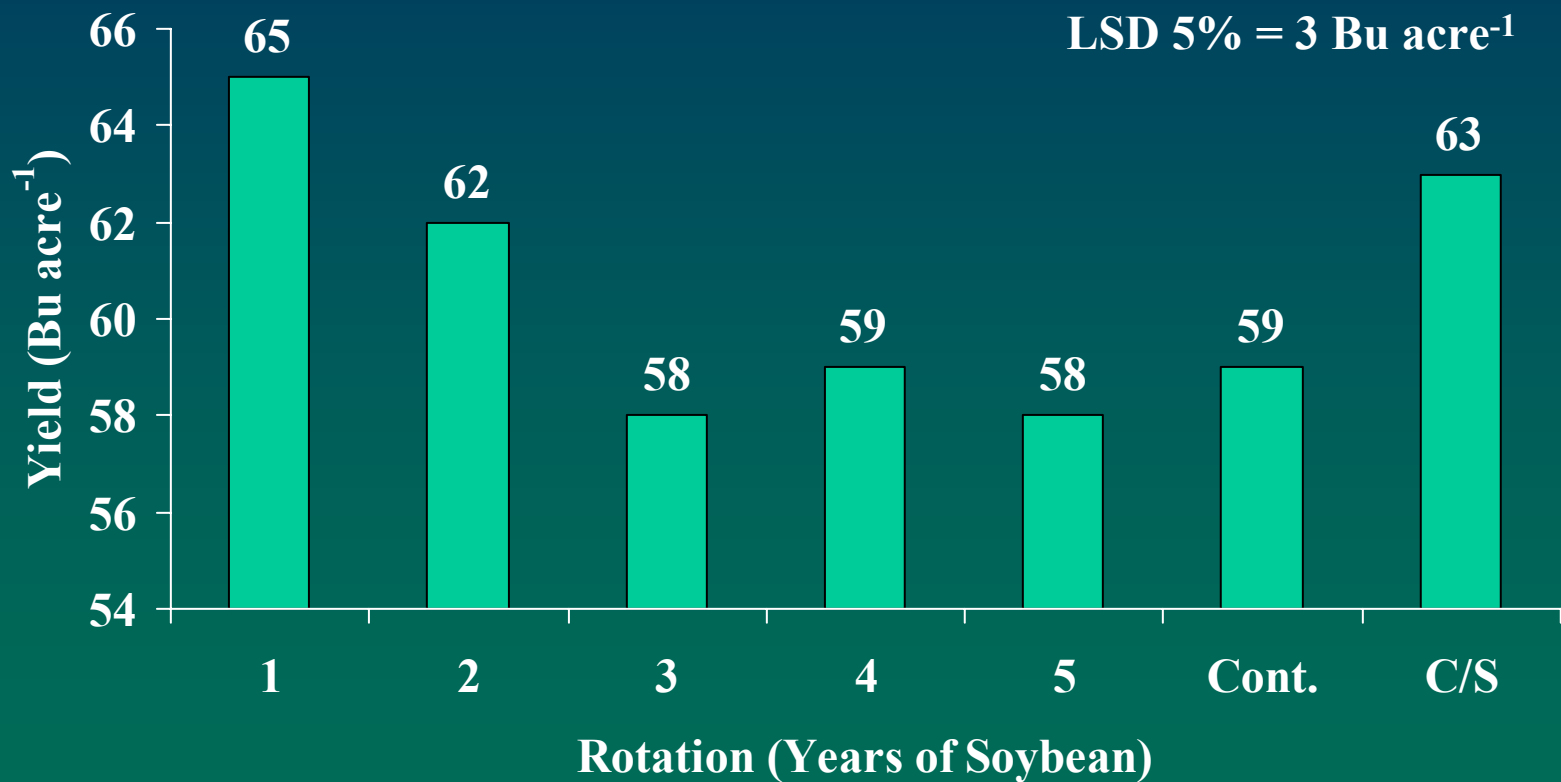


# Material and Methods

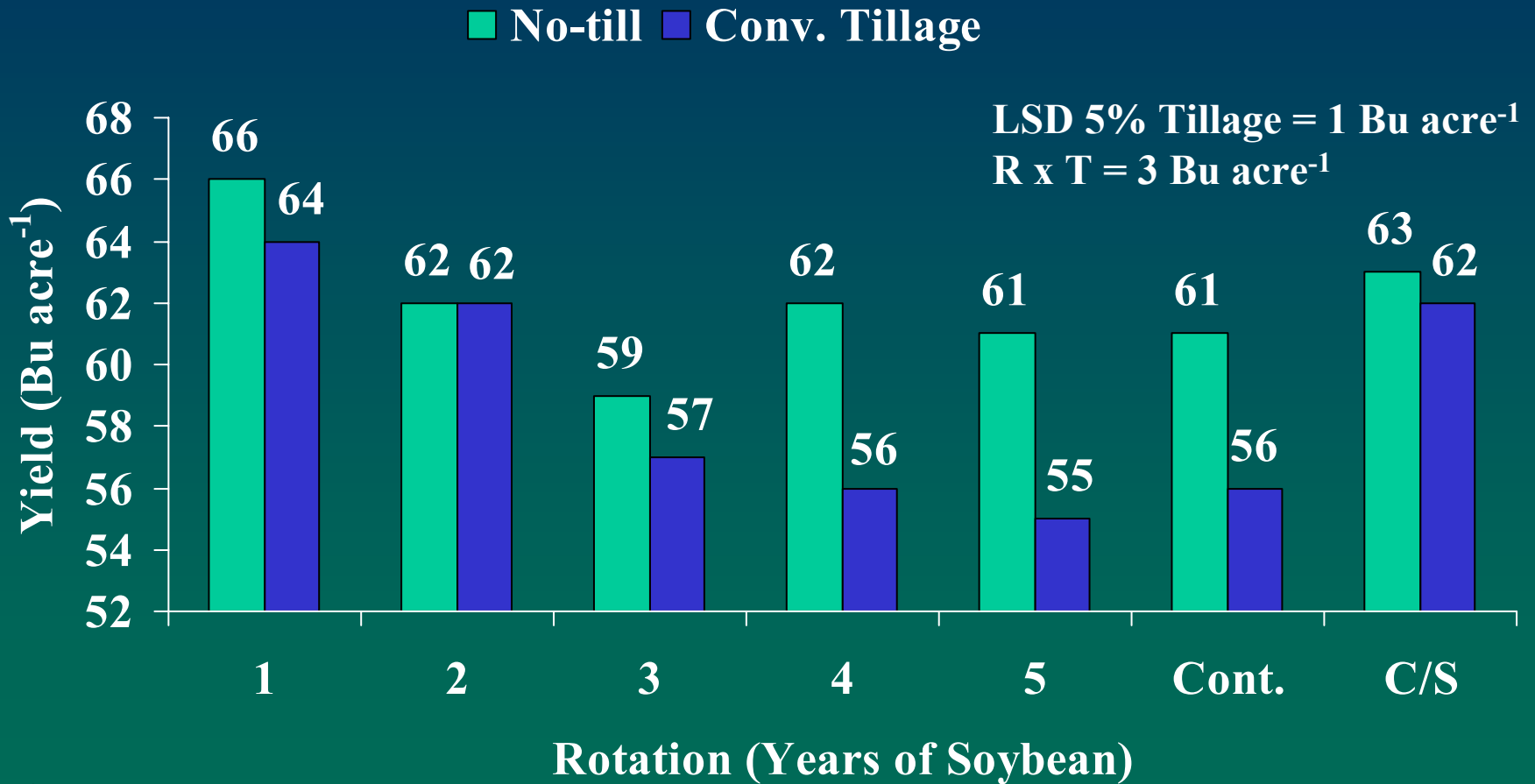
- Three row spacings (7.5”, 15”, and 30”). Soybean was planted at 225K, 175K, and 125 K acre<sup>-1</sup>



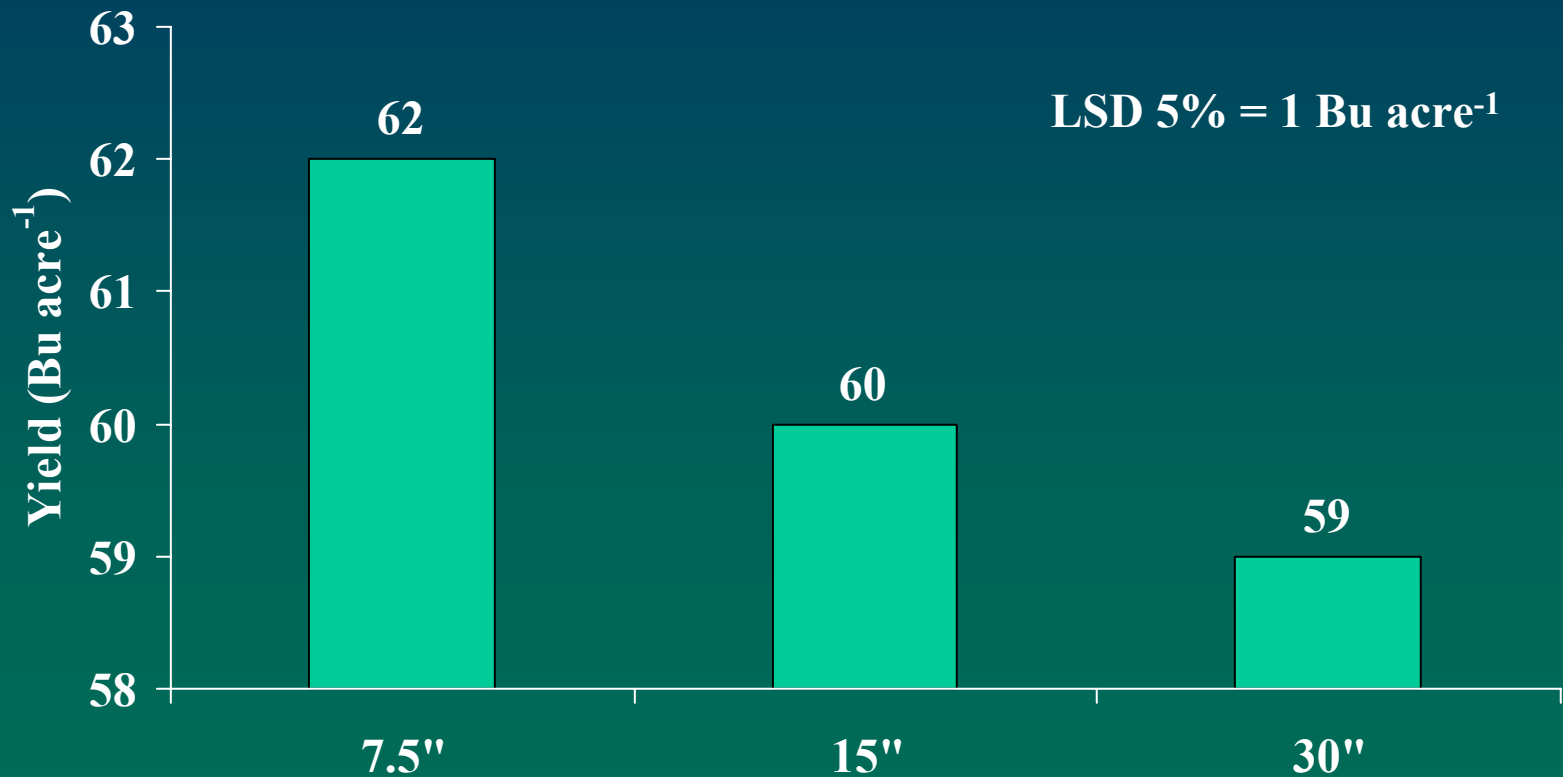
# Effect of Rotation Sequence on Soybean Yield, 1998-2000



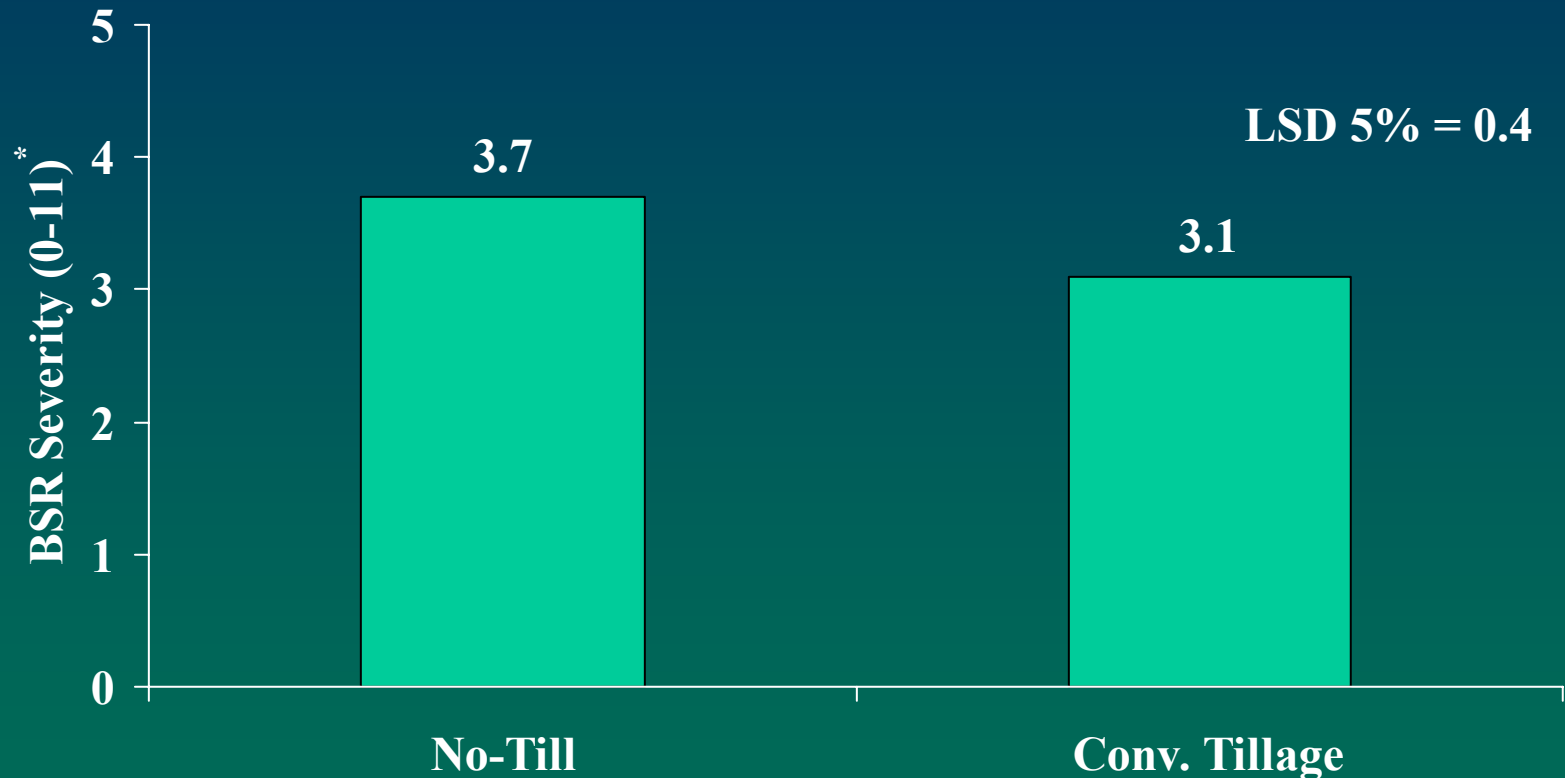
# Interaction of Rotation Sequence and Tillage on Soybean Yield, 1998-2000



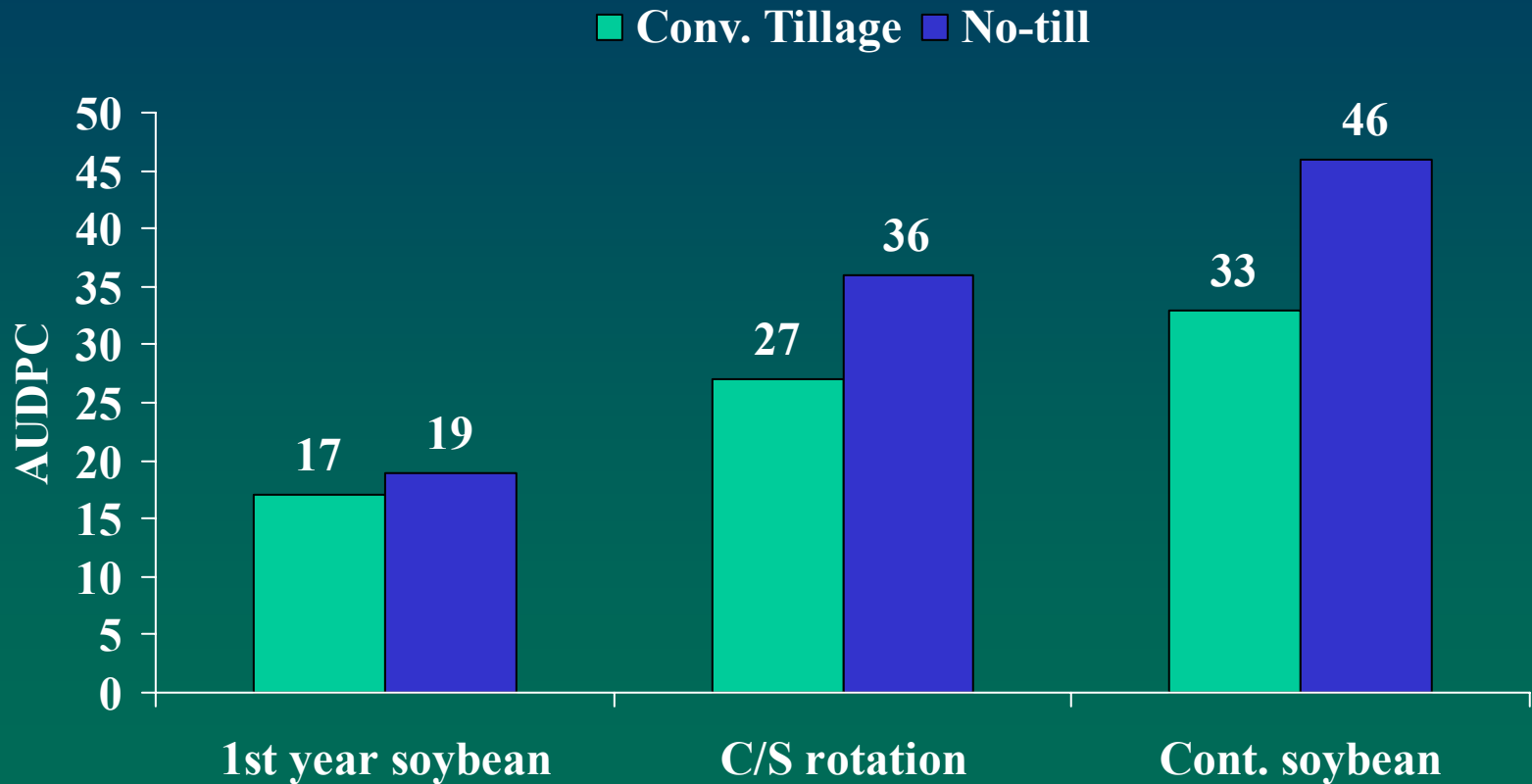
# Row Spacing Effect on Soybean Yield, 1998-2000



# Effect of Tillage on BSR Severity, 2000



# Effect of Rotation Sequence on BSR Disease Incidence





# Summary

- 1<sup>st</sup> year soybean and soybean rotated annually with corn yielded greater than continuous soybean
- There was an interaction of soybean yield with rotation sequence and tillage system
- Averaged over all plots soybean yields were greater with no-till than with conventional tillage



# Summary

- **Row spacing had an effect on yield. Soybean yield increased as row spacing decreased from 30” to 7.5”**
- **Tillage had an effect on BSR severity. The highest BSR severity was found in the no-till system**
- **Other factors are causing the rotation effect as well**



# Conclusion

- **If raising non-rotation soybean:**
  - **Use moderate to resistant varieties**
    - **No-tillage**
    - **7.5” row spacing**

