

# Is Ground Rolling For You?



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# Why Do We Roll Our Fields?



# Previous Research by NDSU

Greg Endres and Bob Henson

- 2003 and 2004
- Looked at timing:
  - Pre-plant
  - 50% emergence
  - Cotyledon
  - V1
  - V3-4, am vs. pm (only in 2004)
  - No rolling
- Data collected for stand, injury, lodging, and yield




# Which Treatment had the Best Yield?

1. Control - no rolling
2. Pre-plant rolling
3. 50% Emergence
4. Cotyledon
5. V1 - 1<sup>st</sup> trifoliolate
6. V3 - 3<sup>rd</sup> trifoliolate




# NDSU Findings - Yield (bu/ac)



Trt	2003	2004
Control	29.2	23.4
Pre plant	30.9	19.2
50% Emergence	28.7	21.4
Cotyledon	29.1	16.1
V1	30.8	23.4
V3 am	---	18.7
V3 pm	---	24.7
LSD (0.05)	NS	NS

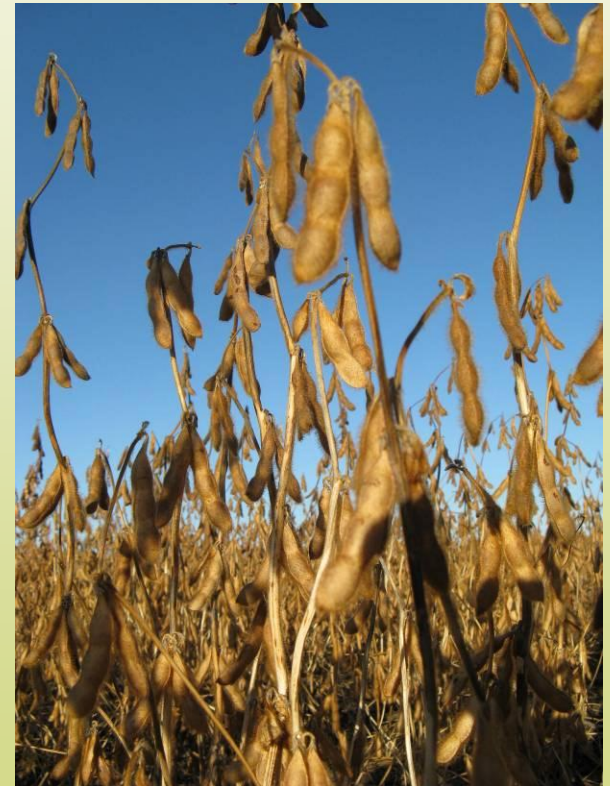
# NDSU Findings - Plant Injury (%)



Trt	2003	2004
Control	0	0
Pre plant	1	8
50% Emergence	0	6
Cotyledon	6	6
V1	14	13
V3 am	---	34
V3 pm	---	15
LSD (0.05)	5	10

# NDSU Summary

- Stand injury increased as rolling was delayed
- No statistical differences with final stand count, lodging, and yield
- Rolling (V3-4) in the morning created more plant injury than in the afternoon



# 2008 Research Information



## ■ Locations:

- Albertville
- Canby
- Morris
- Wood Lake

## ■ Treatments:

- Pre plant
- Post plant
- Cotyledon emergence
- 1<sup>st</sup> trifoliolate
- 3<sup>rd</sup> trifoliolate
- No rolling

## ■ Measurements:

- Population
- Infiltration capacity/erosion
- Est. residue coverage
- Harvestability
- Yield

## ■ Co-horts

- Doug Holen, Phil Glogoza, Seth Naeve
- Producers, crop consultants, UMN, ARS, Soybean Growers



# Wood Lake Site

- Flex Coil Packer
- Drilled soybeans
- Historically - post plant rolling
- Plot size 60' by 500'
- Fairly smooth landscape and 65% residue



# Canby Site

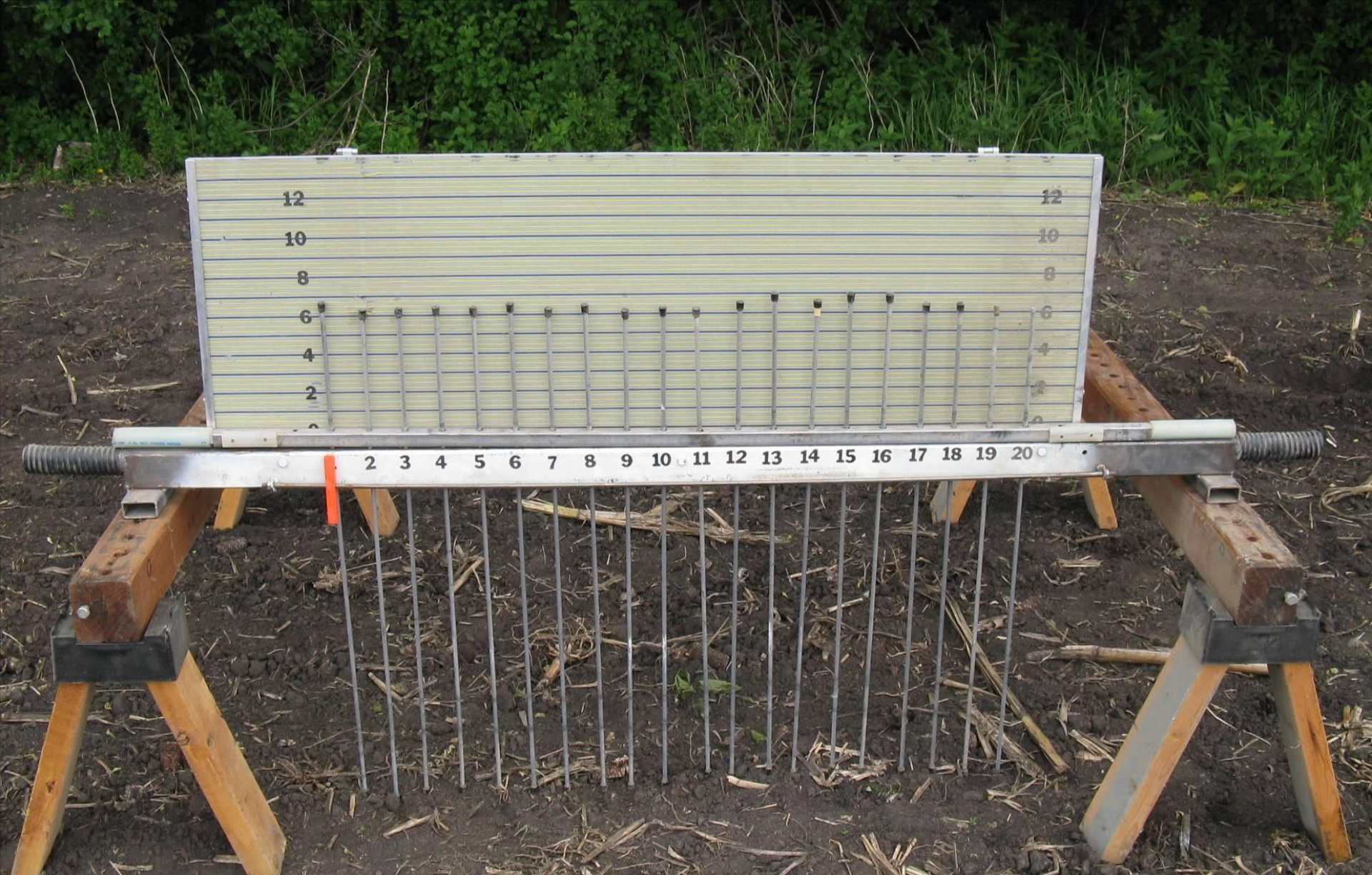
- Modified anhydrous tanks
- 15" soybeans
- Historically pre plant rolling
- Plot size - 14' x 600'
- Very hilly landscape and <20% residue



# Albertville Site

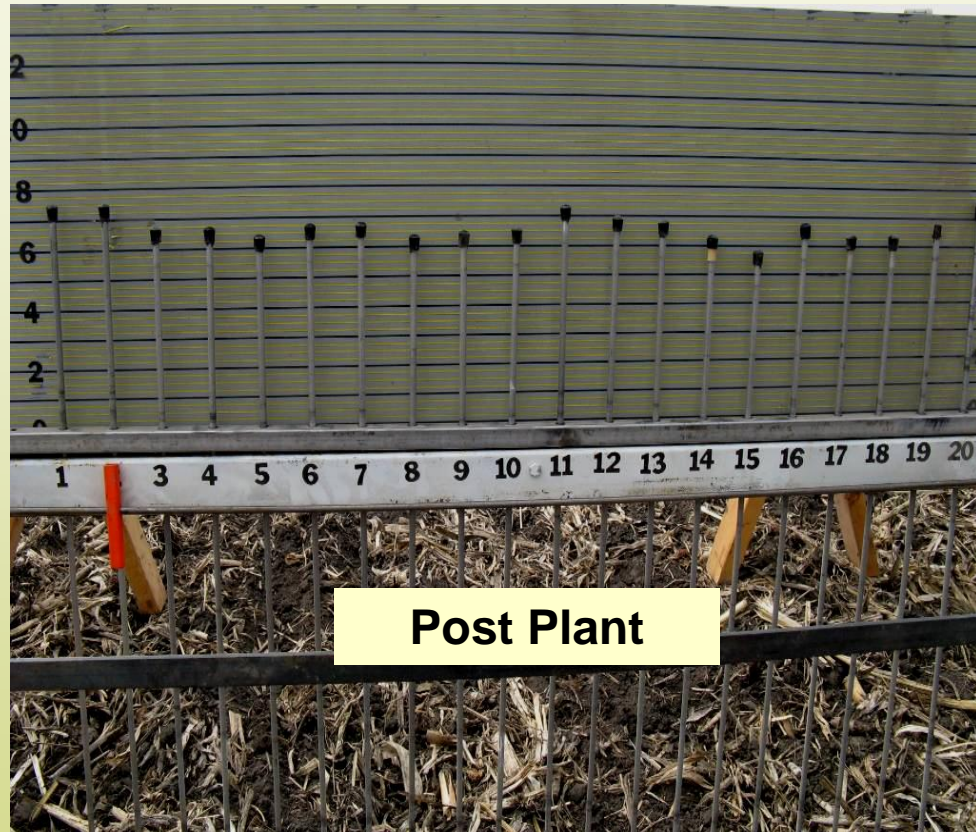
- 45' roller
- 30" soybeans
- First year trying ground rolling
- Field divided in sections and hand harvested for replication
- Fairly flat field and <15% residue





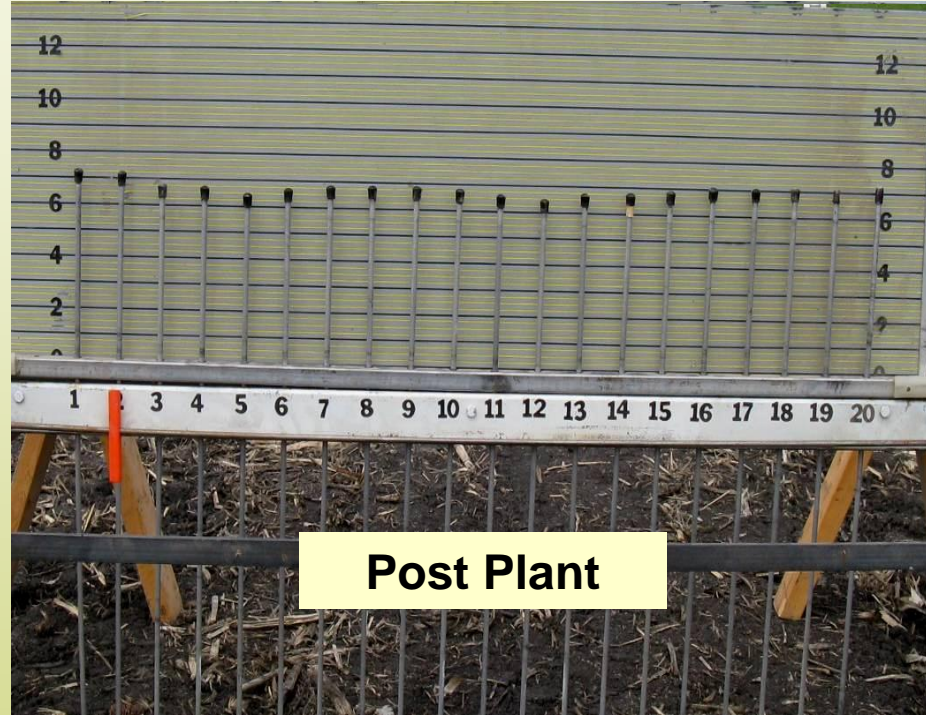
ARS Pin Meter

# Wood Lake - Pin Meter Data



Post Plant

# Canby - Pin Meter Data



# Rolling with Heavy Residue

- Residue protects the emerging plant and cushions the plant at later stages.



# Rolling at First Trifoliolate - V1



**Checking plants 10 days after rolling**

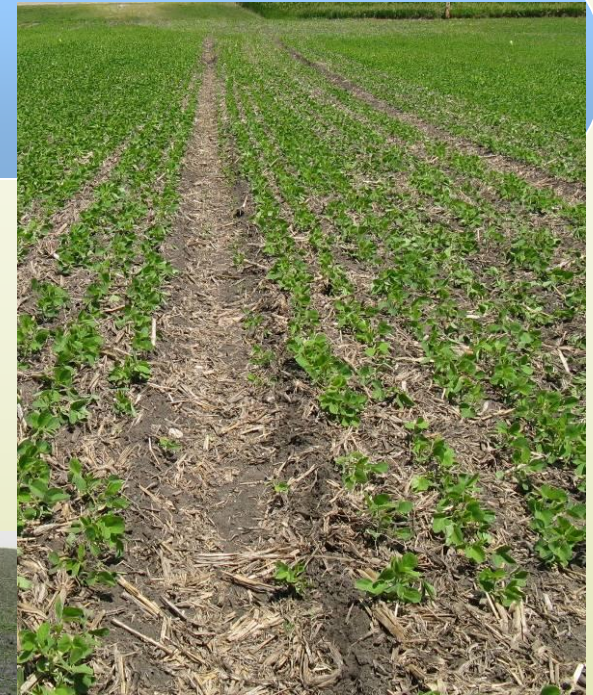


**Rolling day damage**



# Rolling at V1 and V3

- Wheel traffic was more damaging to soybeans than rolling



# Rolling at 3<sup>rd</sup> Trifoliate - V3

- Growers were not comfortable with rolling this late. Two agreed to roll one plot but not at all three.

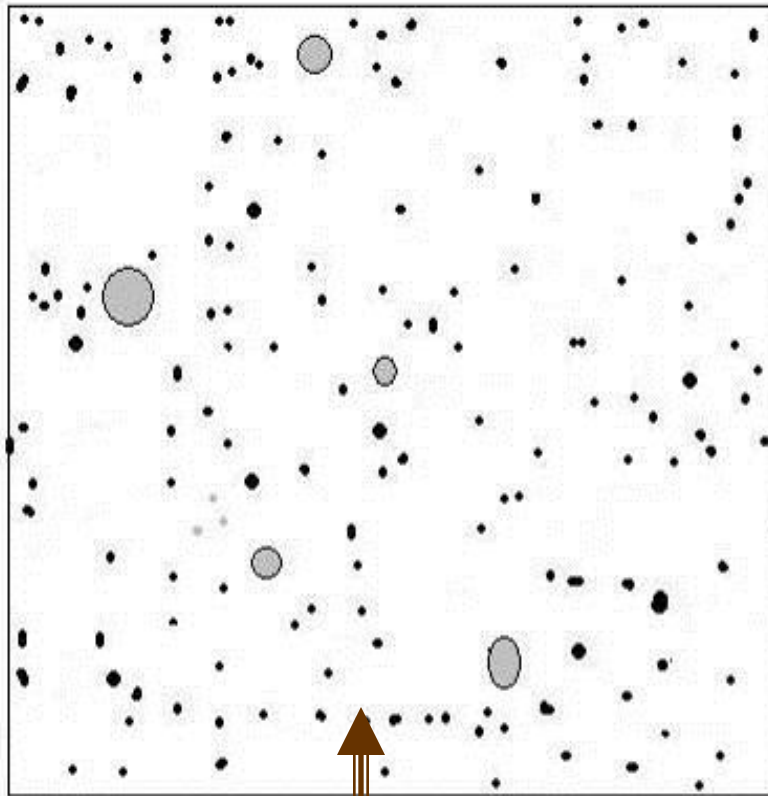


# Other Potential Problems

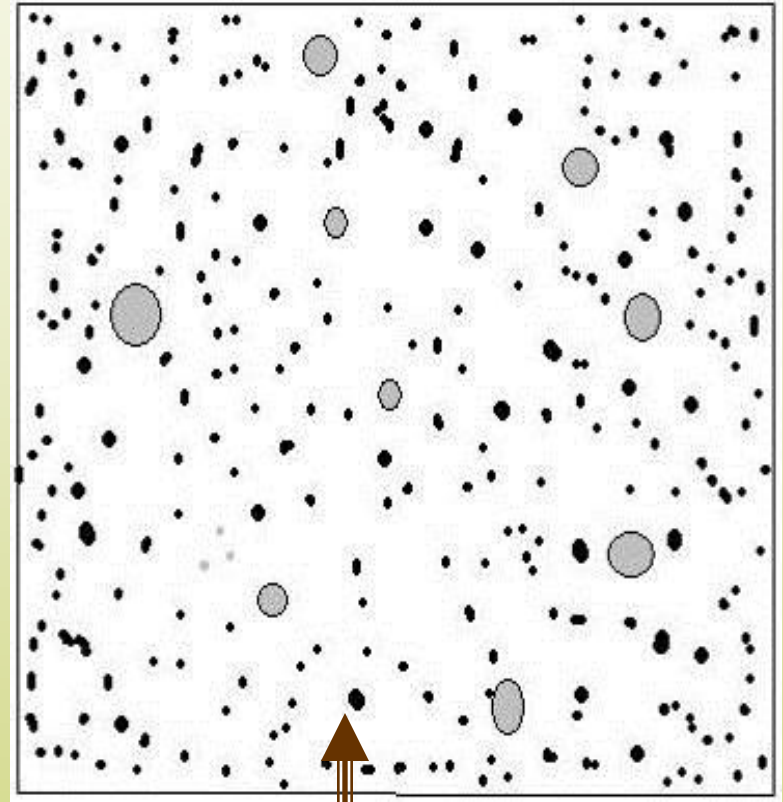


- Breakdown of surface aggregates
- Sealing the soil
- Decreased infiltration
- Increased erosion
  - Wind and water

# Soil Infiltration Potential



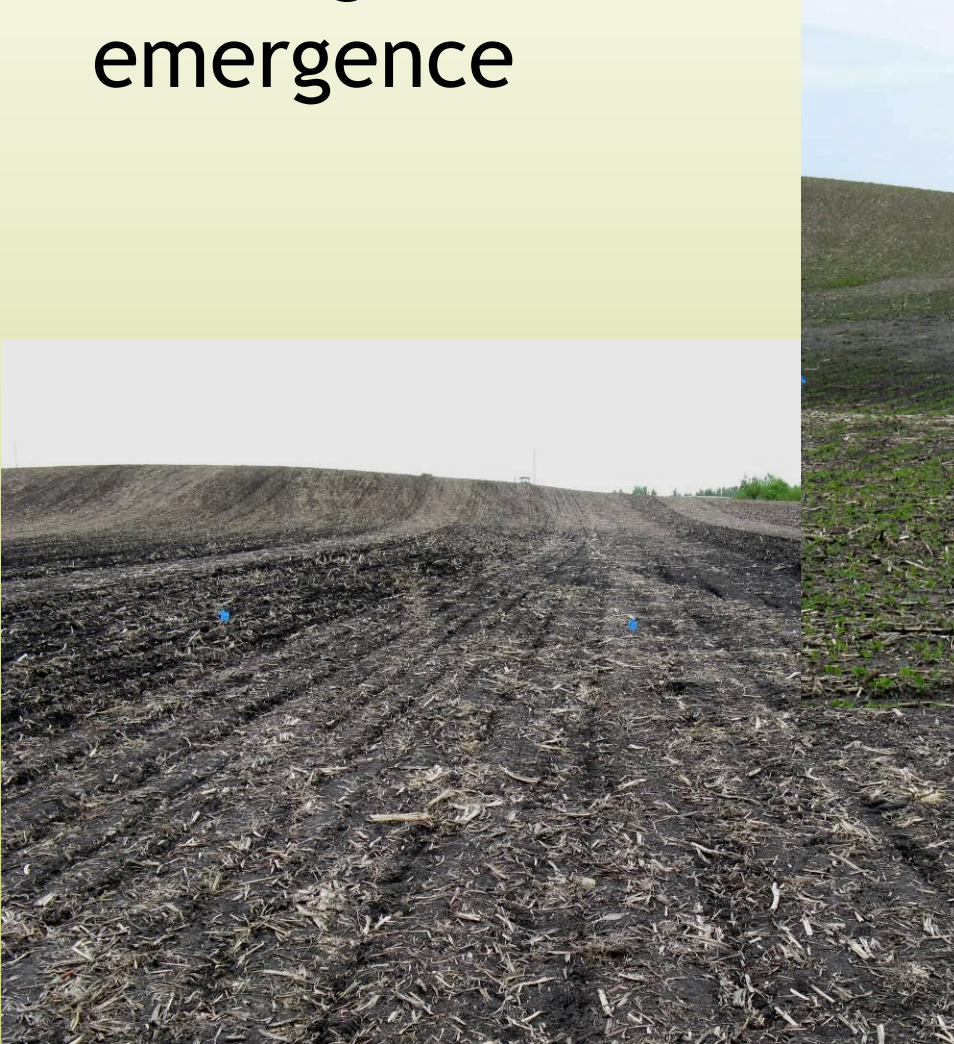
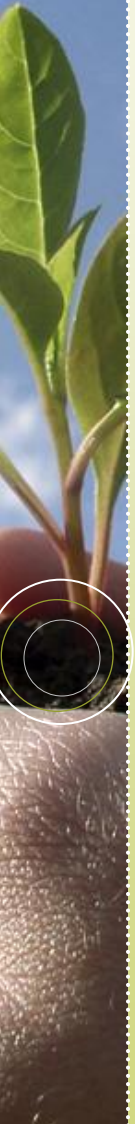
Rolled



Not Rolled

# Drown-out at Canby

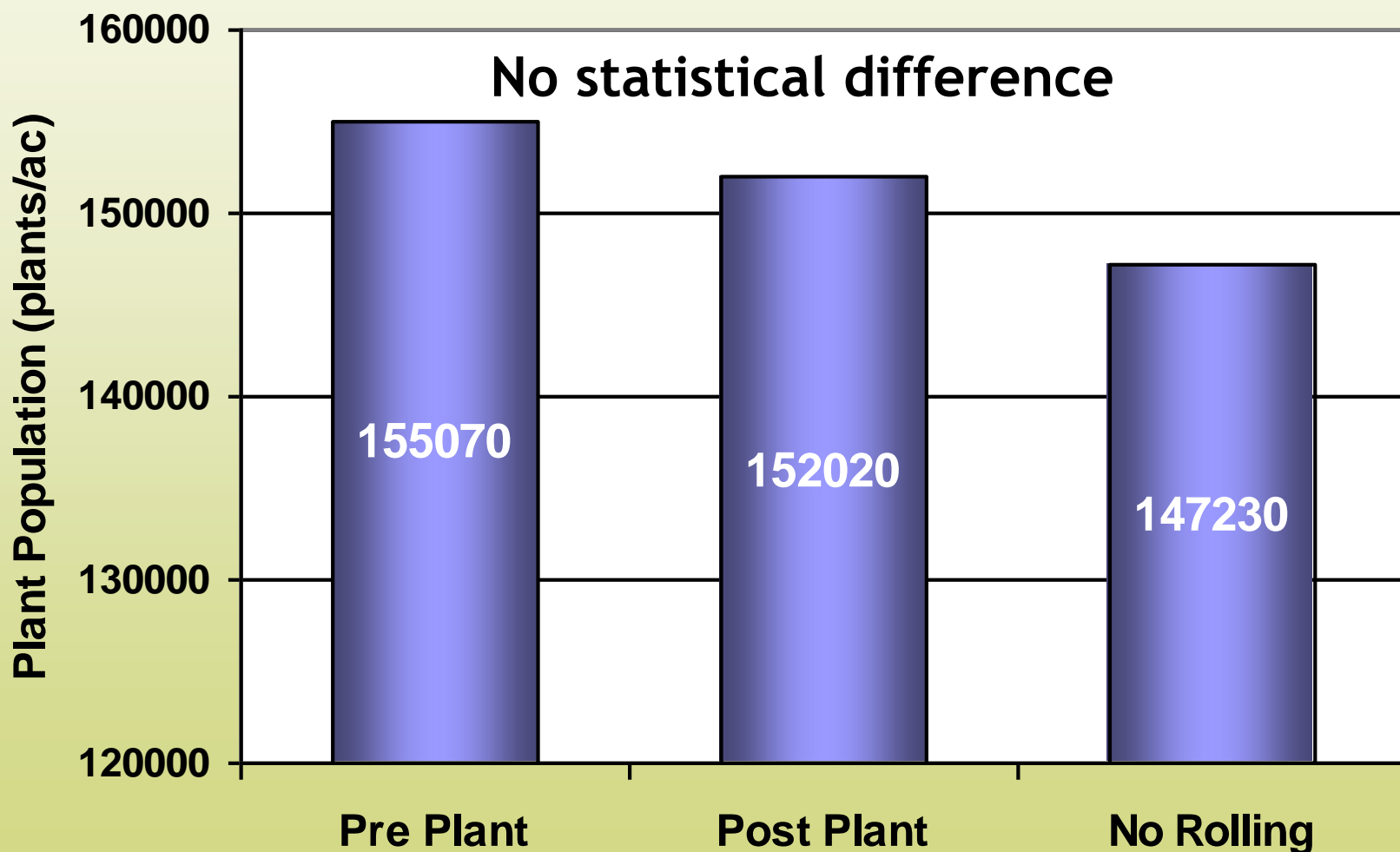
Pounding rain around  
emergence



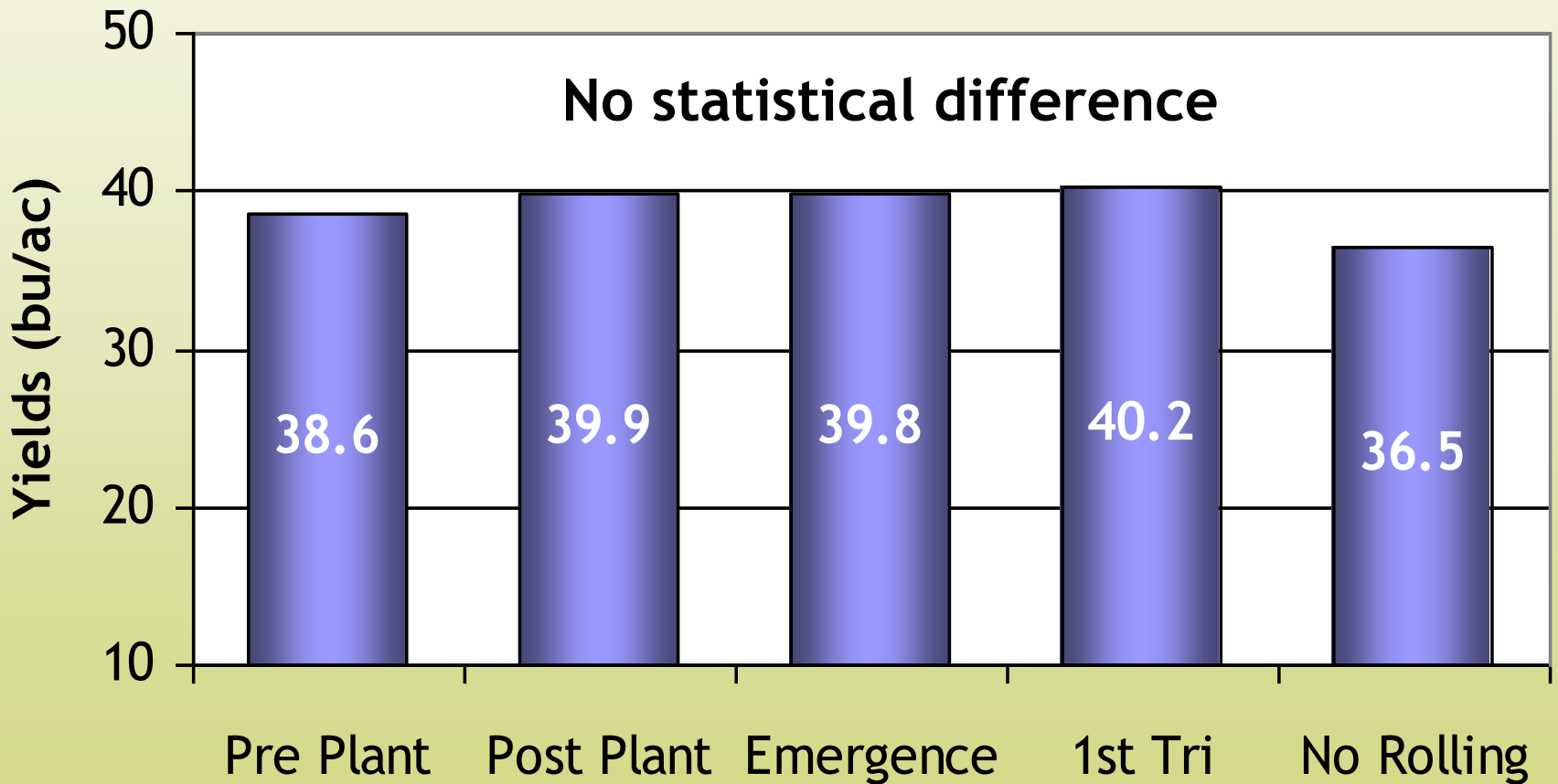
# Drown-out at Canby



# Wood Lake Plant Populations



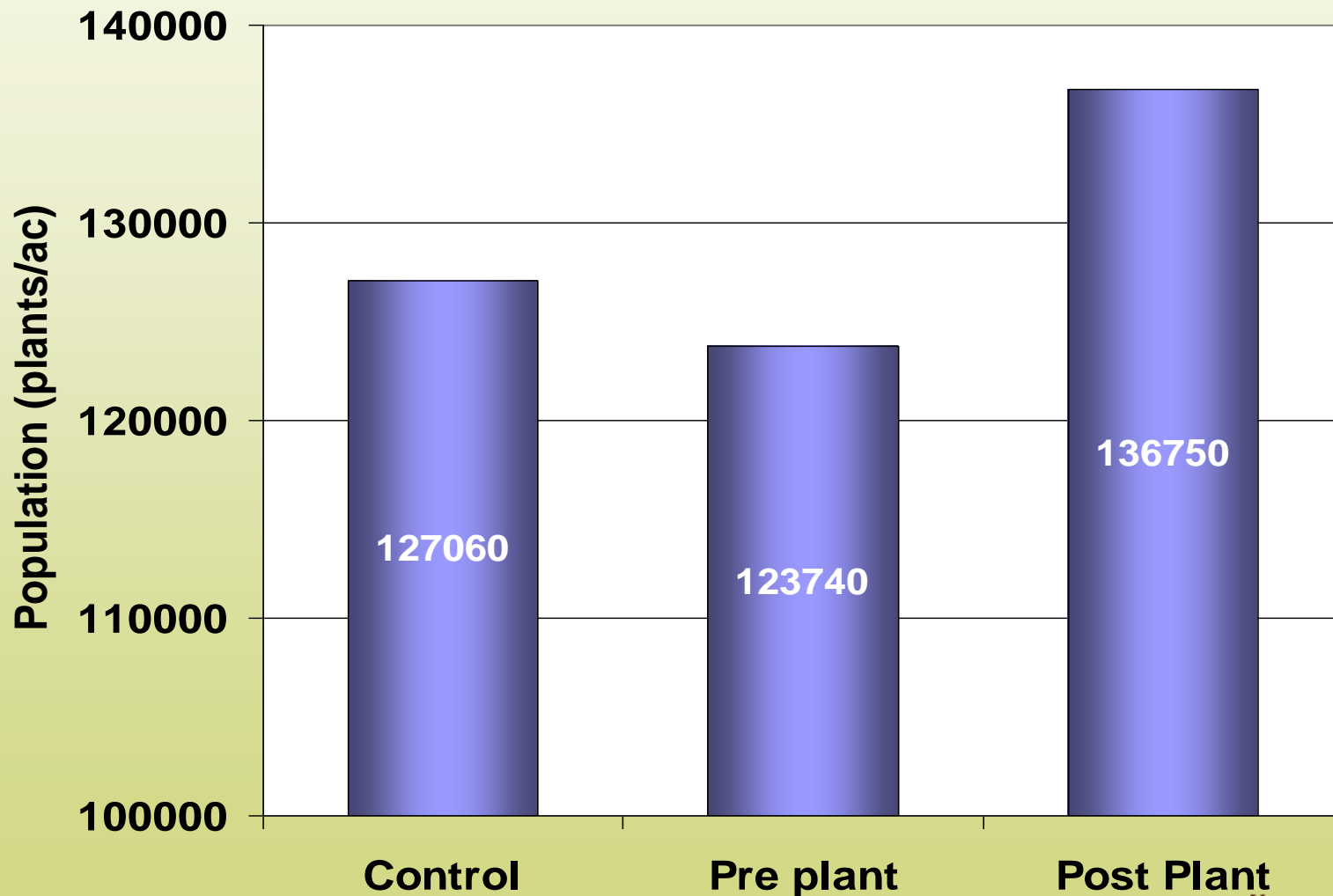
# Wood Lake Rolling Yields



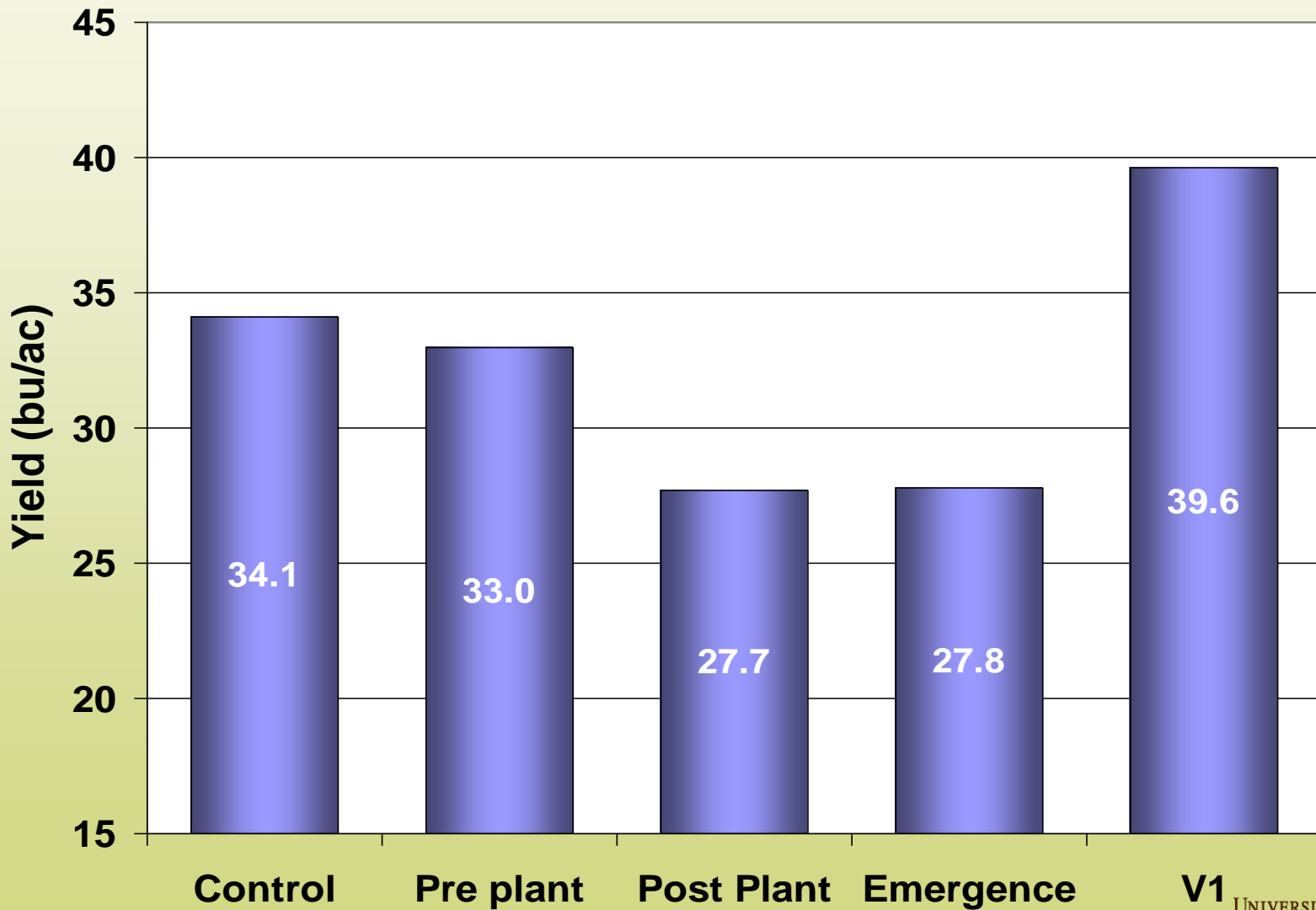
Yield for 3<sup>rd</sup> trifoliolate (one rep only) = 39.9 bu/ac



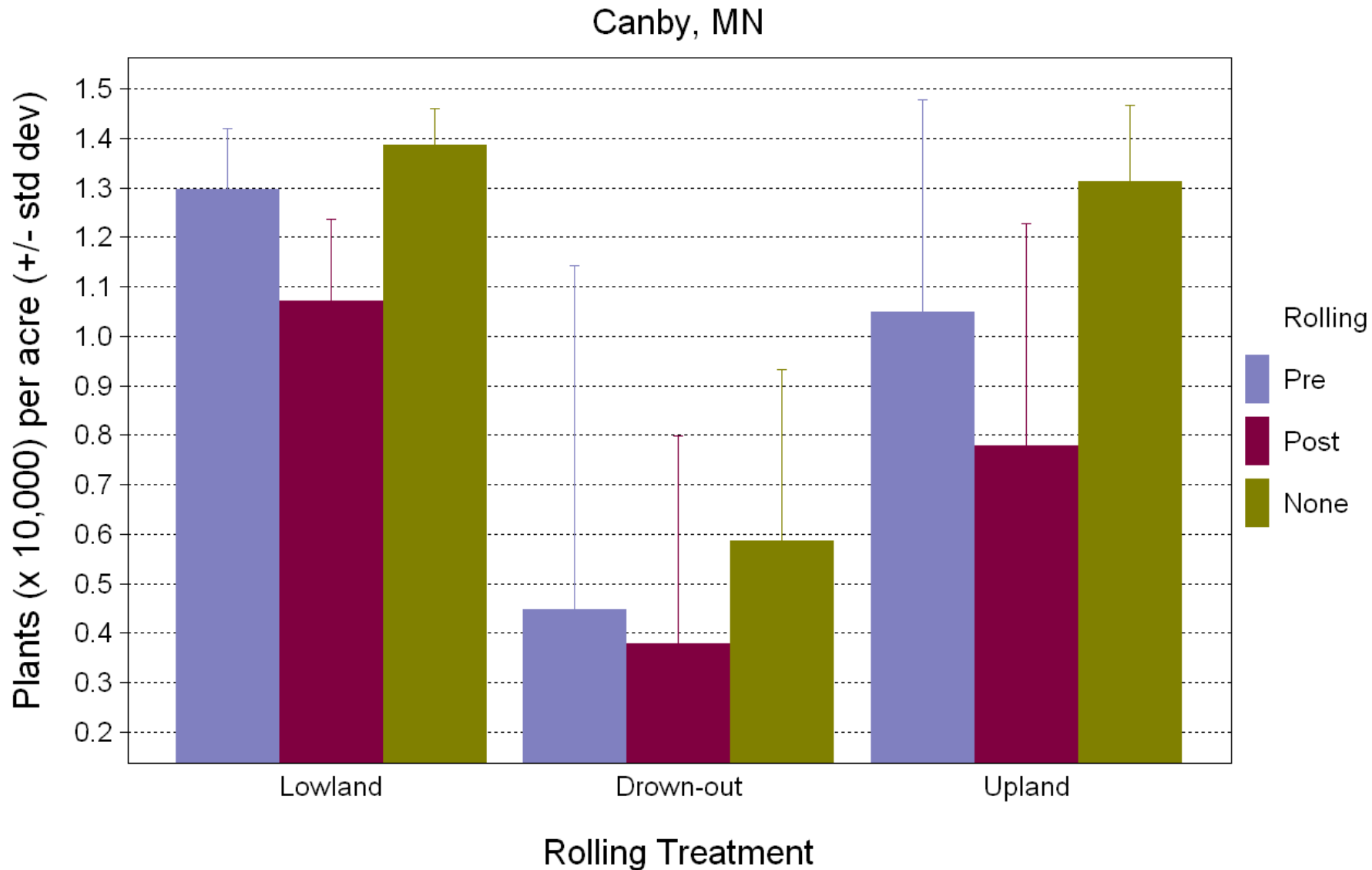
# Albertville Plant Populations



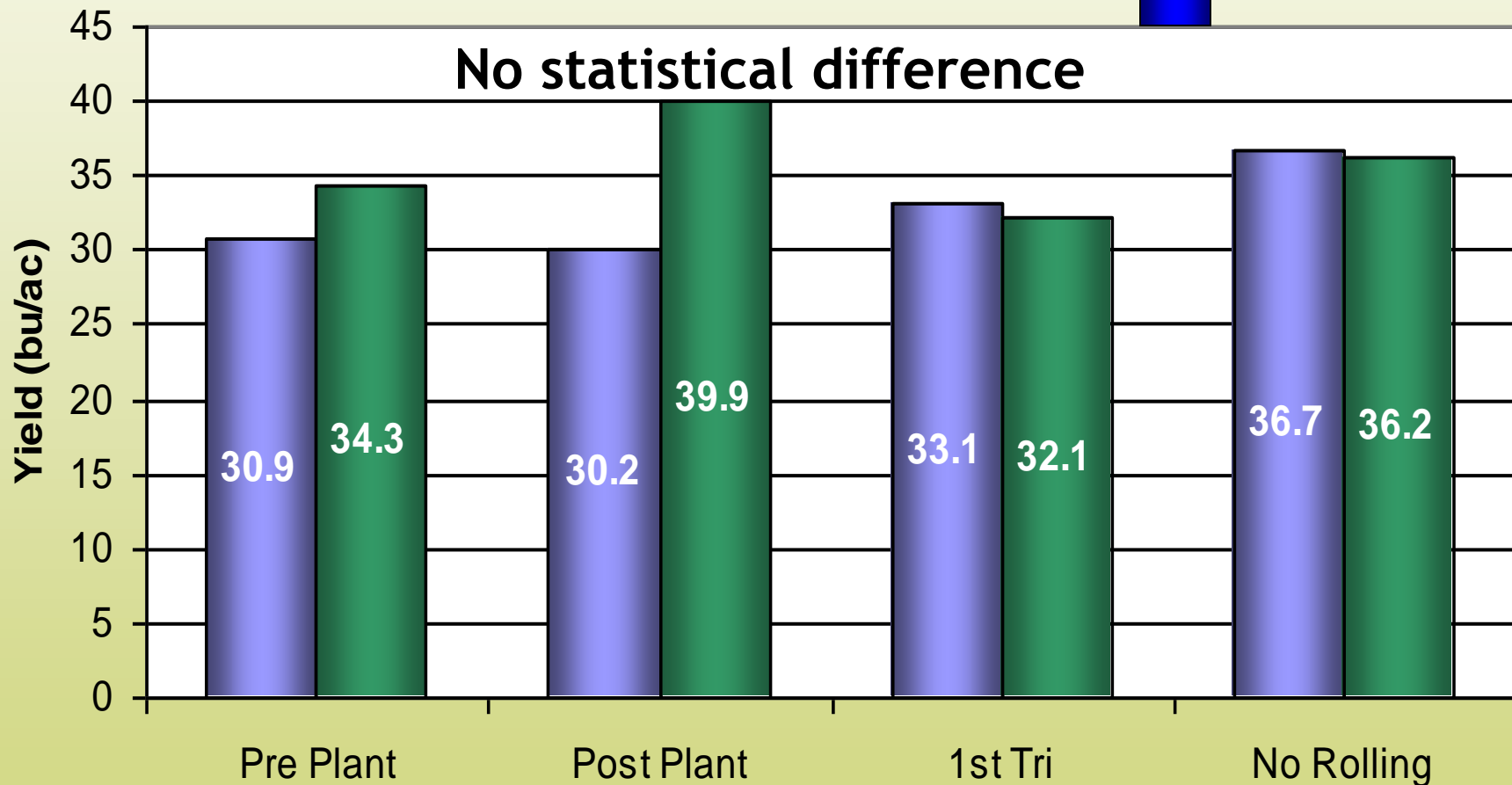
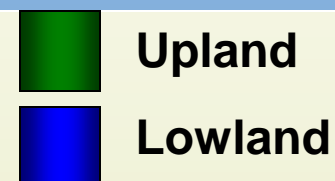
# Albertville Rolling Yields



# Canby Plant Population - June 18<sup>th</sup>



# Canby Rolling Yields



Lowland yield for 3<sup>rd</sup> trifoliolate (one rep only-no drownout) = 42.3 bu/ac

# Iron Chlorosis and Rolling

- Rollers are not heavy enough to aid in reducing iron chlorosis.
- If the roller worked, growers would have found that out a long time ago.



Branching after rolling killed the main stem

# What We Have Learned So Far:

- Residue protects the plant from rolling
- Later rolling induced more plant damage
- Rolling did not significantly change yields and stand counts
- Higher potential for sealing the soil
- Harvest was less stressful with rolled plots



# Plans for Next Year

- Keep same protocol as '08
- 5 sites in NW and WC MN
- Add intern to gather more data
  - residue levels throughout season
  - plant injury scores
  - disease ratings
- Add water infiltration



# Questions?

