

# Considerations of Fall Herbicide Applications in Corn and Soybean Production Systems

Dr. Kevin Bradley  
Associate Professor, State Weed Scientist  
University of Missouri

# Considerations of Fall Herbicide Applications

1. Spring weather uncertainty
2. Impact on soil conditions
3. Other pest interactions
4. Weed management

# Considerations of Fall Herbicide Applications

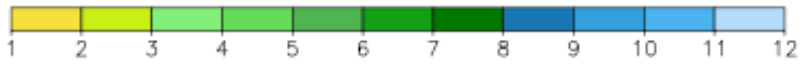
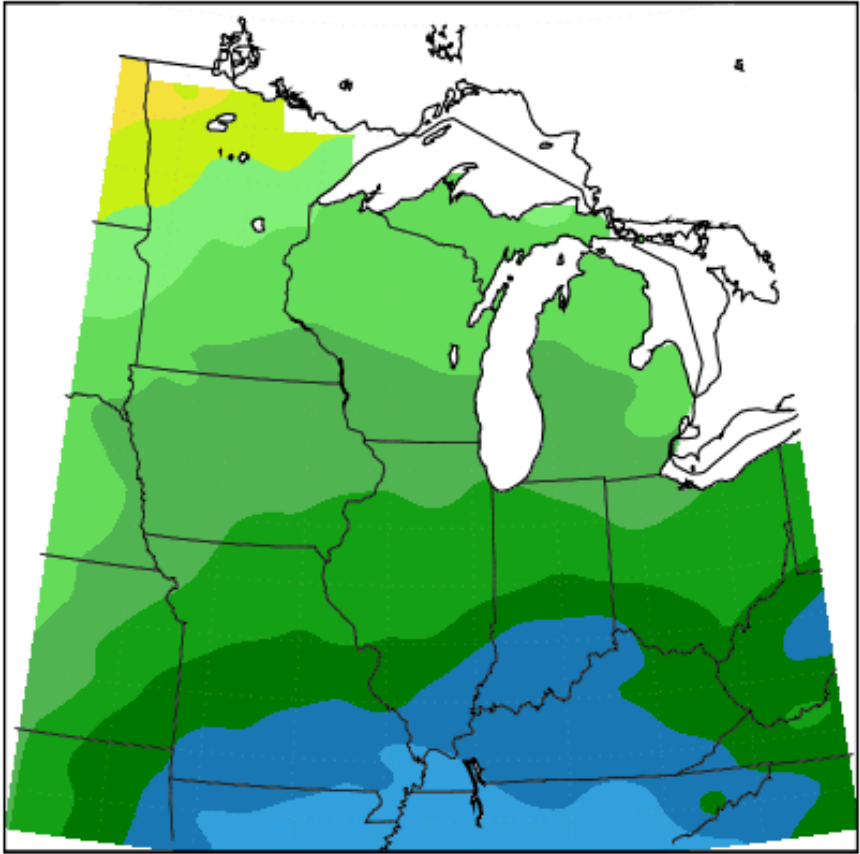
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2. **Impact on soil conditions**
3. **Other pest interactions**
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# The Great Unknown:

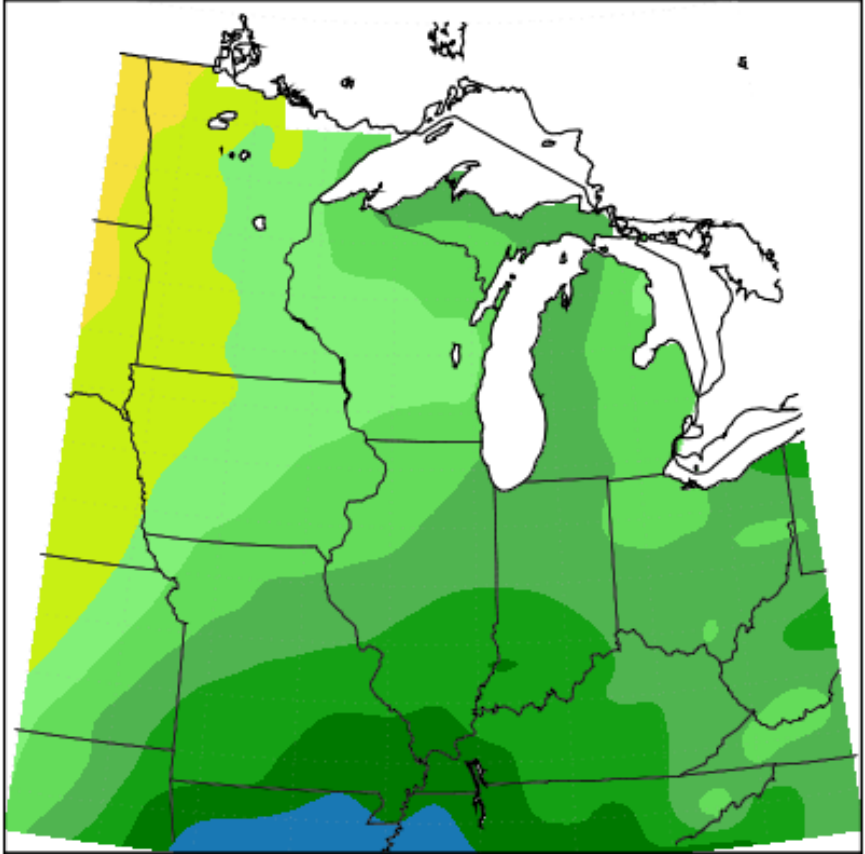
What kind of spring weather conditions will we have?



**30-year average monthly precipitation, Mar-Apr (1981-2010)**

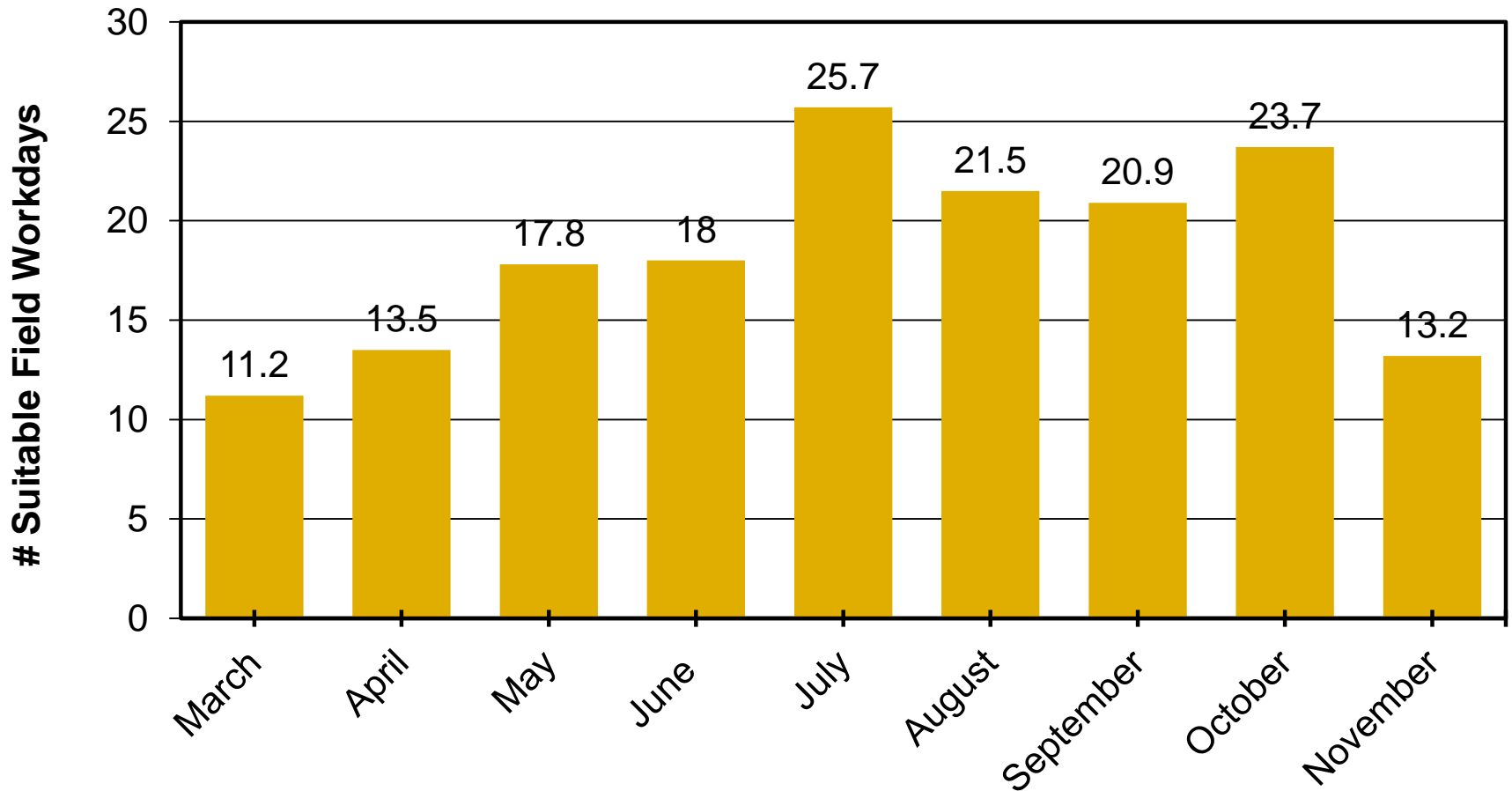


**30-year average monthly precipitation, Oct-Nov (1981-2010)**

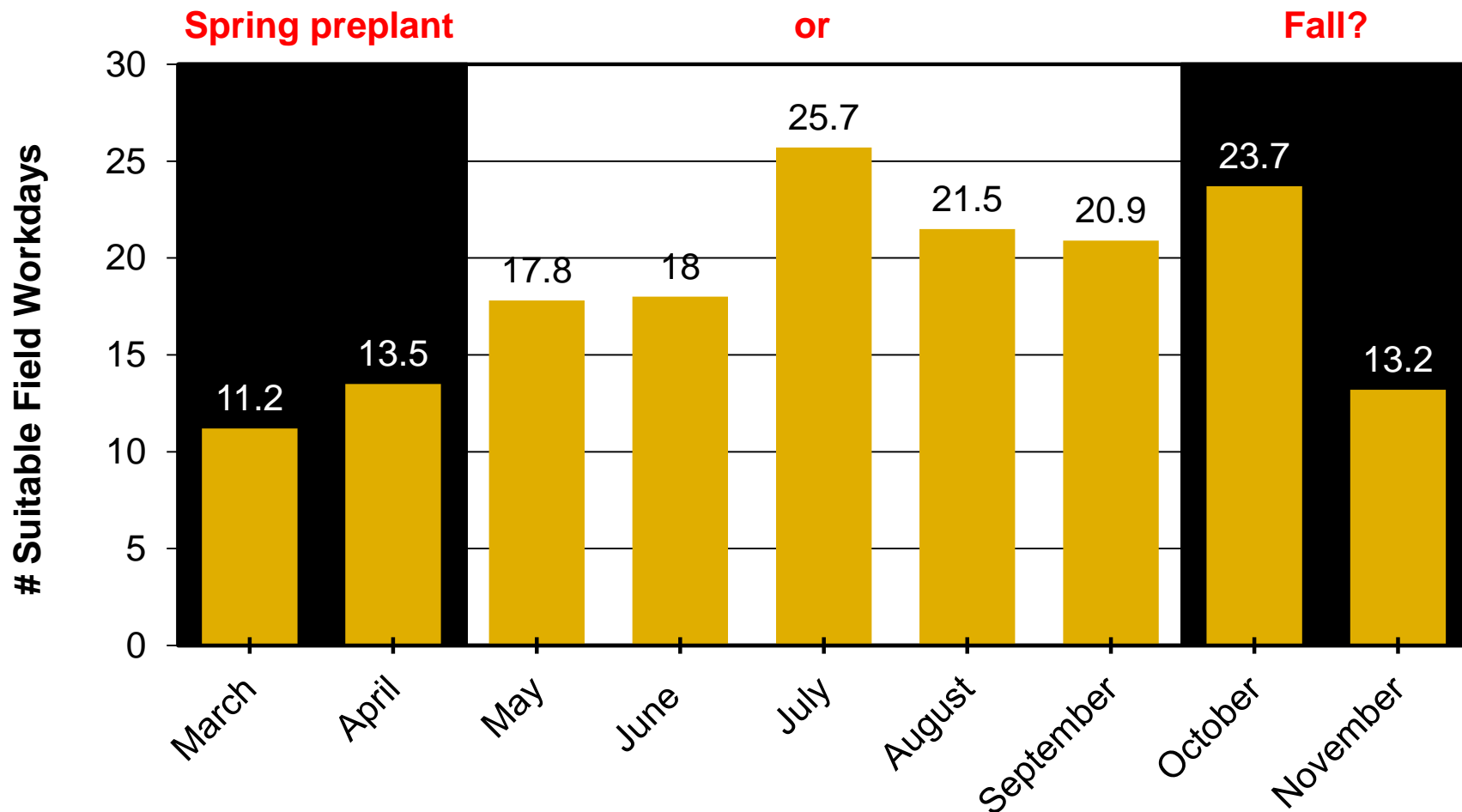


Source: Midwestern Regional Climate Center/Missouri Climate Center

# Suitable Field Workdays in Missouri (30 year average)



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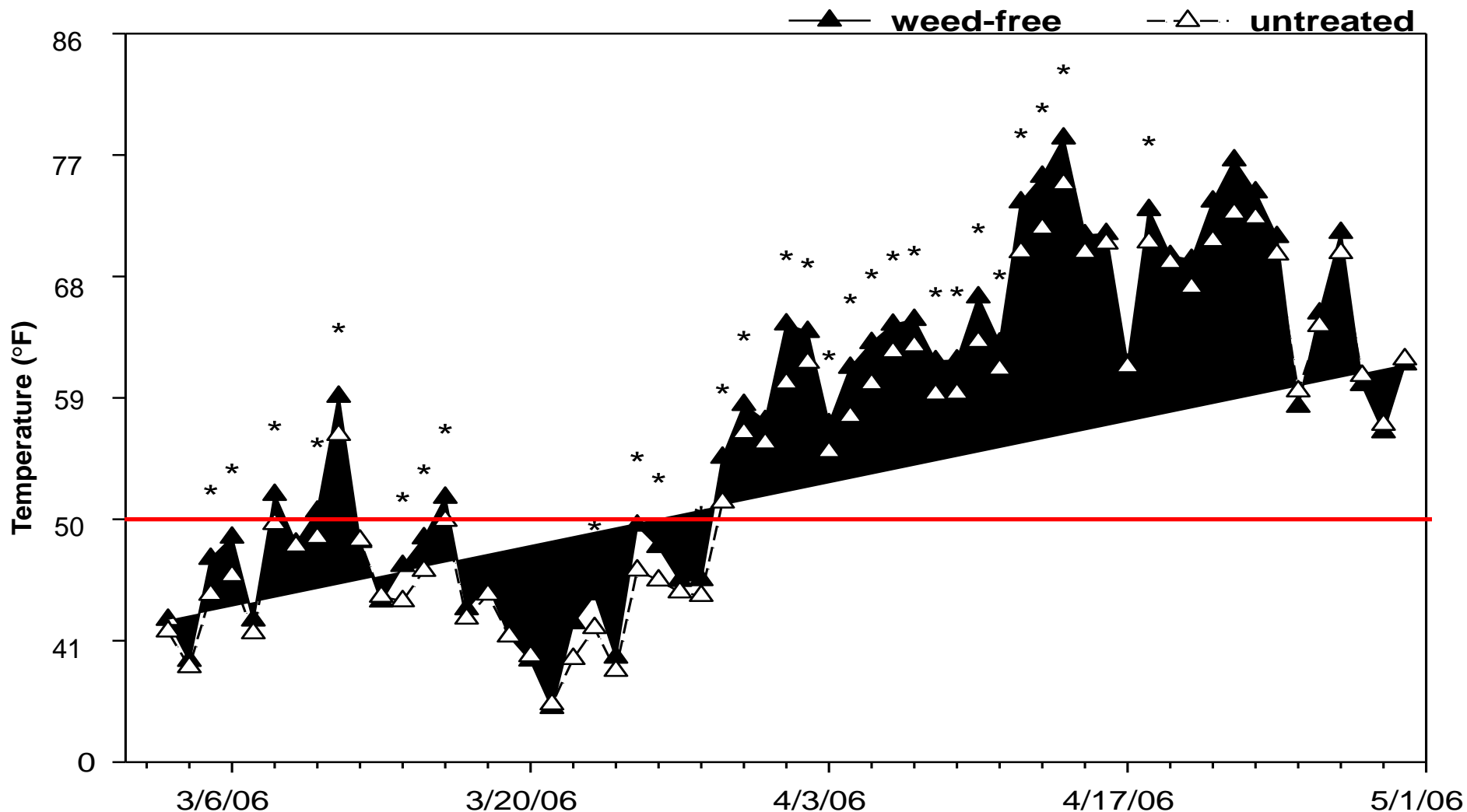


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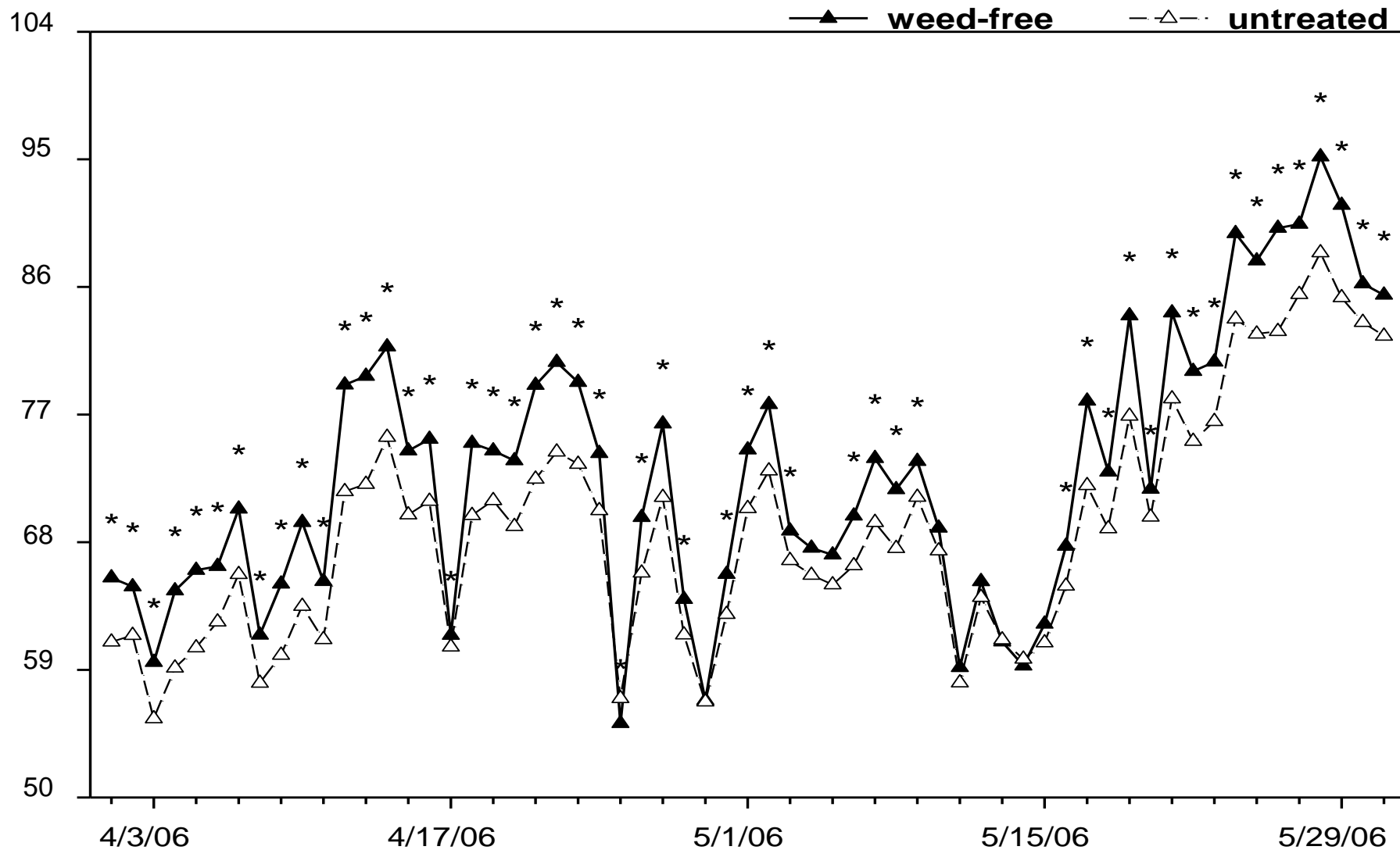


# Influence of Winter Annual Weed Removal with a Residual Fall Herbicide Application on Soil Temperature Prior to Corn Planting



\*Untreated plots contained a dense cover of winter annual weeds compared to weed-free plots treated with a residual herbicide in the fall. Asterisks indicate significant differences in soil temperature within a day.

# Influence of Winter Annual Weed Removal with a Residual Fall Herbicide Application on Soil Temperature Prior to Soybean Planting



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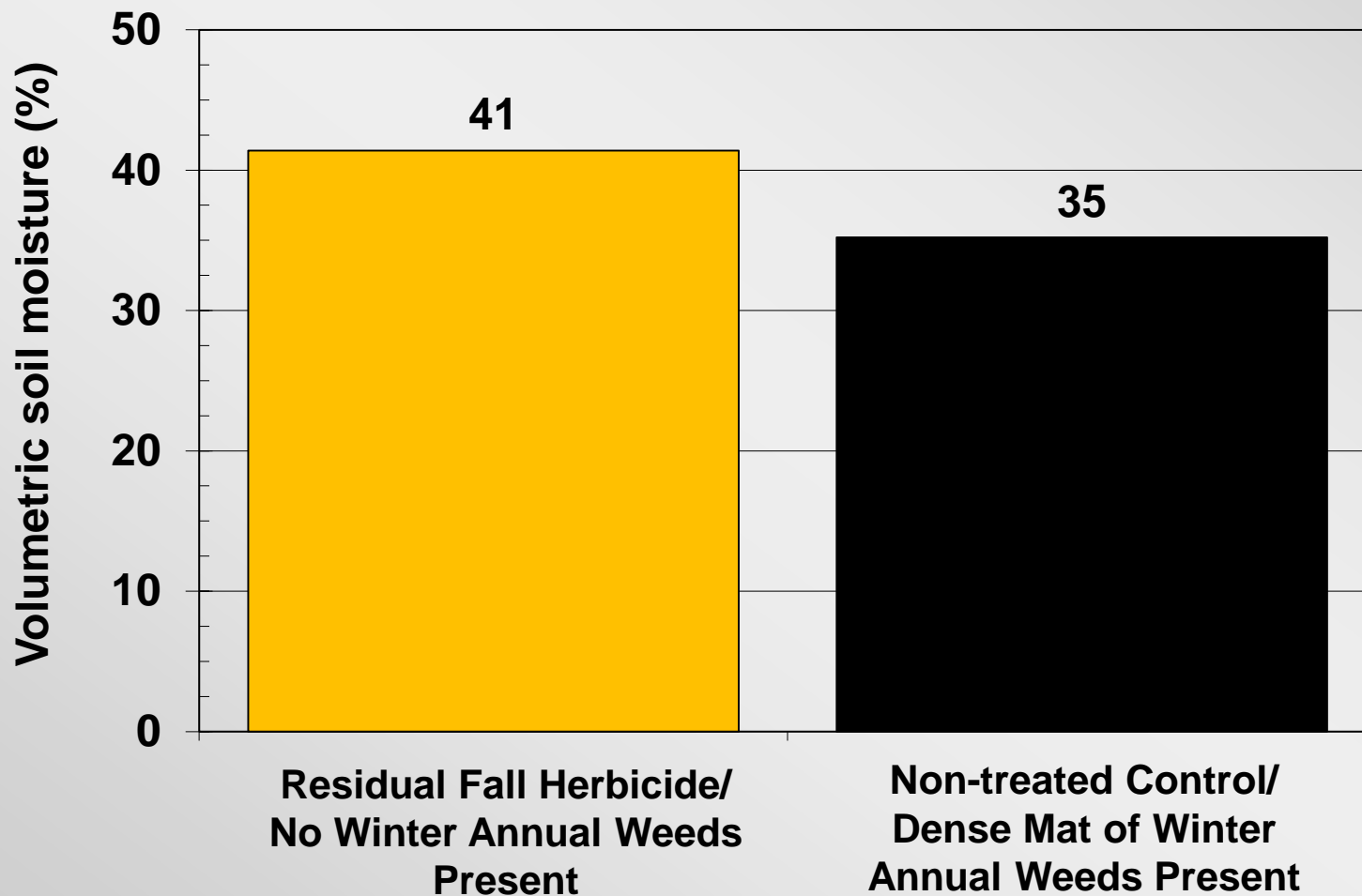


# Summary of Effects of Winter Annual Weeds on Soil Temperature

## (Missouri Research Results)

- The presence of winter annual weeds generally reduced soil temps in corn and soybean
- Winter annual weed removal achieved through residual fall herbicide applications increased soil temperatures by as much as 5° in corn experiments and as much as 8° in soybean experiments.

# Influence of Fall Herbicide Application and Winter Annual Weed Removal on Soil Moisture At Soybean Planting





# Summary of Effects of Winter Annual Weeds on Soil Moisture

## (Missouri Research Results)

- The presence of winter annual weeds caused significant reductions in soil moisture in all corn (-13 to -14%) and soybean (-6%) experiments.
- Early spring preplant applications of residual herbicides resulted in similar reductions in soil moisture content as fall applications.

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# Winter Annual Weed Hosts of SCN



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Six winter annual weed species have been documented as alternative hosts for SCN:

1. Purple deadnettle (strong host)
2. Henbit (strong host)
3. Field pennycress (moderate host)
4. Shepherd's-purse (weak host)
5. Small-flowered bittercress (weak host)
6. Common chickweed (weak host)



# Purple Deadnettle





# SCN Cyst on Purple Deadnettle Root



# Henbit





Purple Deadnettle

Henbit

# Field Pennycress









# Smallflowered Bittercress



# Shepherd's-Purse





# Chickweed





**Chickweed**

# Winter Annual Weed Hosts of SCN

- SCN juveniles cannot develop in roots at temperatures below 50°F. But if hosts are growing in SCN-infested fields and soil temps are greater than 50°F, SCN reproduction and increases in populations can occur.
- The SCN life cycle takes about 24 days to complete at ideal temperatures (76°F) but 4 or more weeks at colder temperatures.
- Depending on your location, there may be times when soil temperatures are warm enough for SCN reproduction to occur on winter annual weeds.

# Other Insect Interactions:



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Black cutworm moths are attracted to fields like this in the early spring.



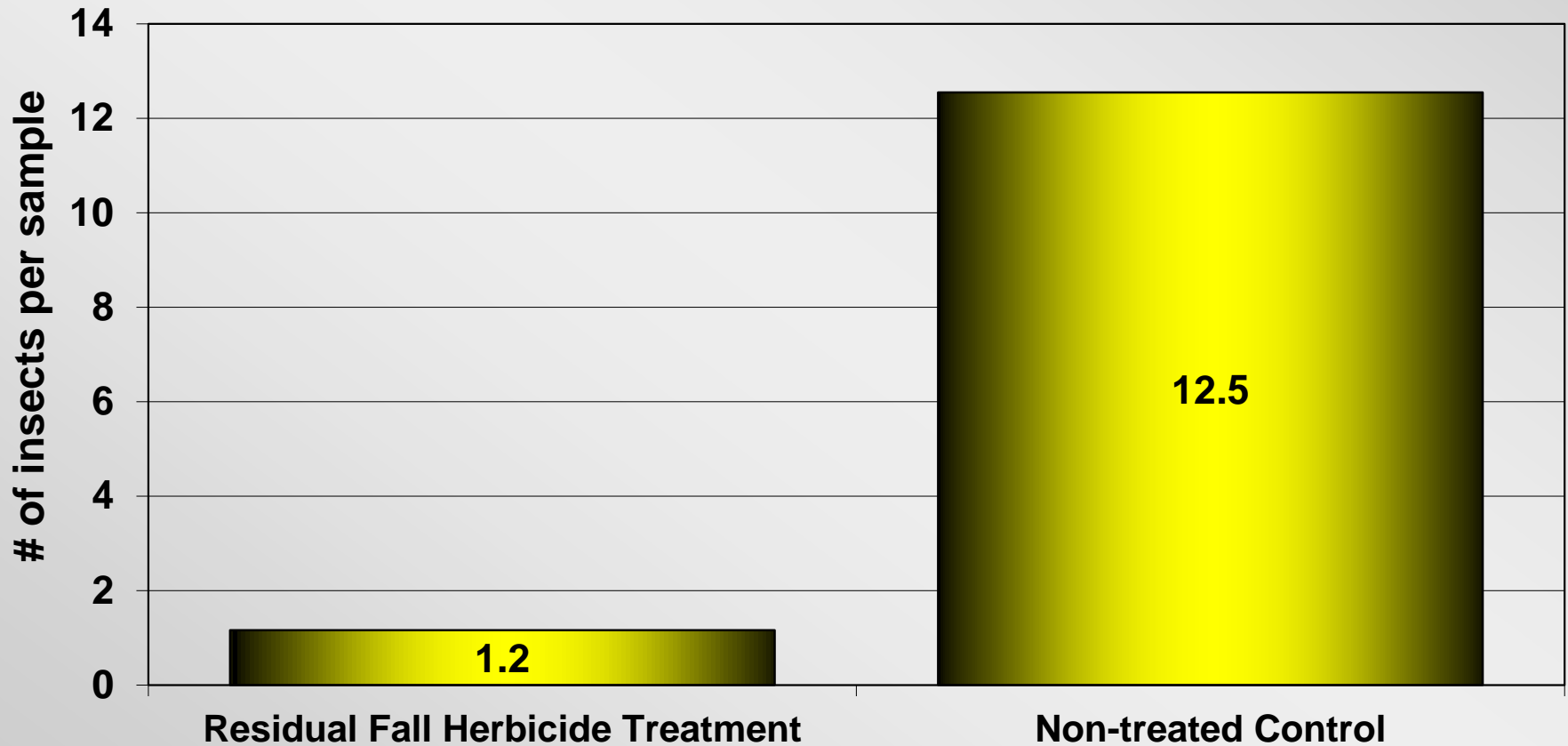


# Other Insect Interactions:

The winter annual weeds serve as oviposition sites for BCW moths. Larvae then hatch and feed on developing corn plants.



# Influence of Weed Removal through a Residual Fall Herbicide Application on Total Insects After Soybean Planting (Missouri Research Results)



# Winter Annual Weed- Insect Interactions

- The BCW interaction is one of the most researched insect-weed relationships and should be a major consideration if you have heavy winter annual weed populations
- Winter annual weeds can act as hosts for corn flea beetle and some other Lepidopteran insects
- Removal of winter annual weeds with fall herbicides significantly reduced total insect populations after planting in soybean (MO research results)



© Boone 2004



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# Weed Management Considerations of Fall Herbicide Applications:



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**#1 All fall herbicide applications ARE NOT created equal.**

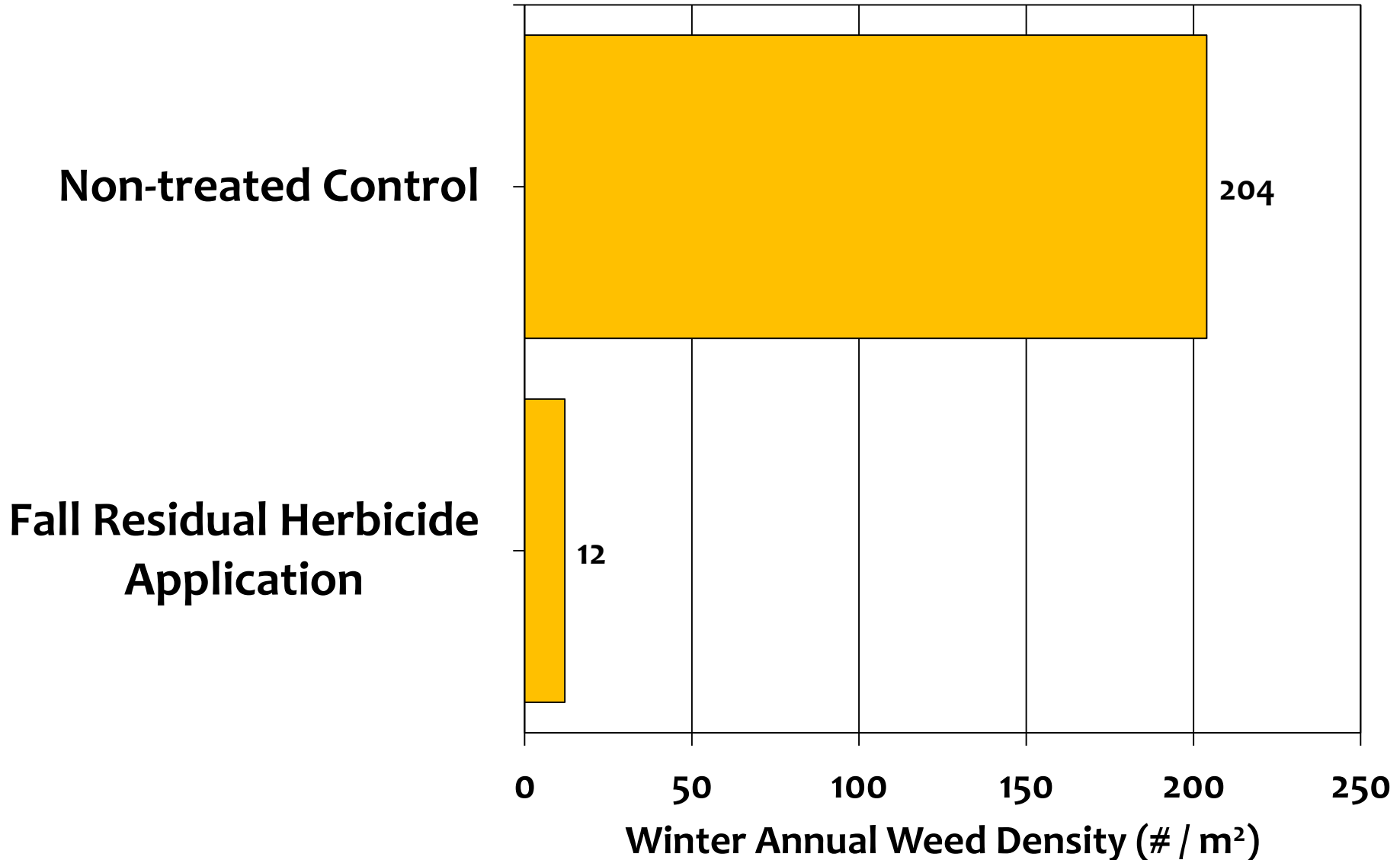
Non-residual programs like glyphosate+2,4-D only provide control of winter annual weeds present at the time of application, but offer no control of weeds that may emerge after the initial application. **RESIDUAL** herbicide programs are required to ensure control of **ALL** winter annual weeds that may emerge up to planting.

# Weed Management Considerations of Fall Herbicide Applications:

#2 Fall herbicide applications provide good control of **WINTER ANNUAL** weeds. Don't expect control of **SUMMER ANNUAL** weeds as well.

# Influence of a Residual Fall Herbicide Application on Winter Annual Weed Density at Soybean Planting

(early April; Columbia, MO 2013)





# Influence of a Fall Residual vs. Spring Preplant Herbicide Application on Cumulative Summer Annual Weed Emergence (through mid-June; Columbia, MO 2013)



# Weed Management Considerations of Fall Herbicide Applications:

#3 Whether or not residual fall herbicide applications “count” as an additional herbicide mode of action for **RESISTANT WEED** management depends on the species!

Horseweed/Marestail:	<b>DEFINITELY</b>
Giant Ragweed:	<b>LITTLE</b> to None
Waterhemp:	Even less to <b>NONE</b>



# Residual Fall Herbicide Applications for Horseweed

- Great fit....it works!
- In recent years (especially 2013) there have been widespread burndown failures with glyphosate, glyphosate + 2,4-D, glyphosate + Sharpen, etc.
- Chlorimuron-containing products are among the most effective residual fall herbicide treatments
- Must be controlled prior to planting; Liberty in LL soybean only effective POST option. No viable POST options in RR soybean.

# Questions?

