

Considerations of Fall Herbicide Applications in Corn and Soybean Production Systems

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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

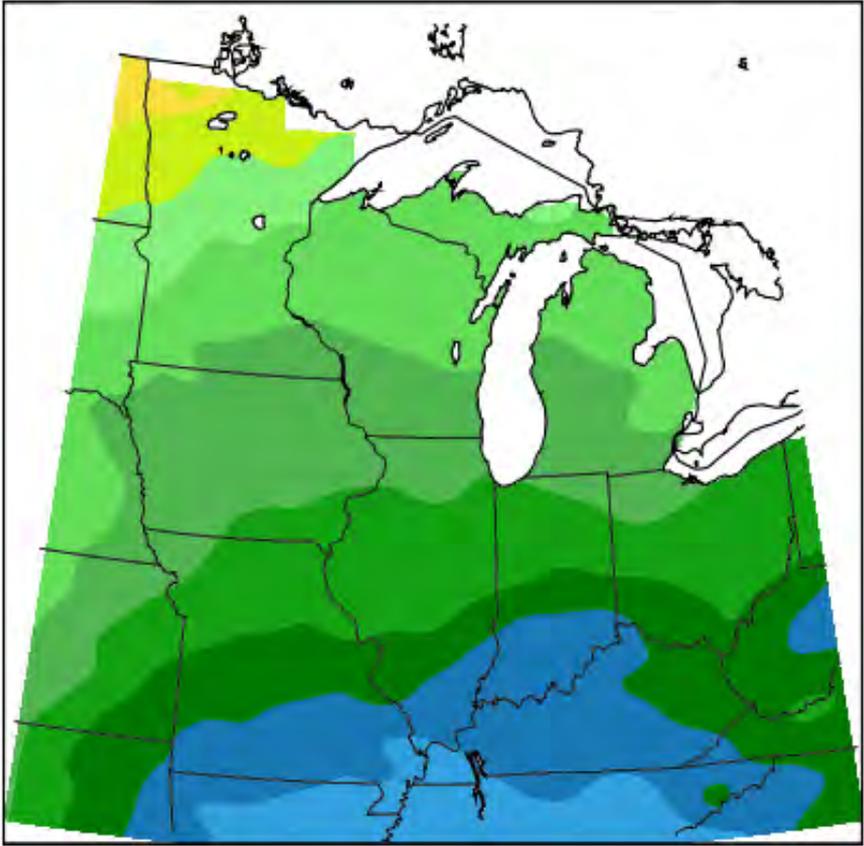
1. **Spring weather uncertainty**
2. **Impact on soil conditions**
3. **Other pest interactions**
4. **Weed management**

The Great Unknown:

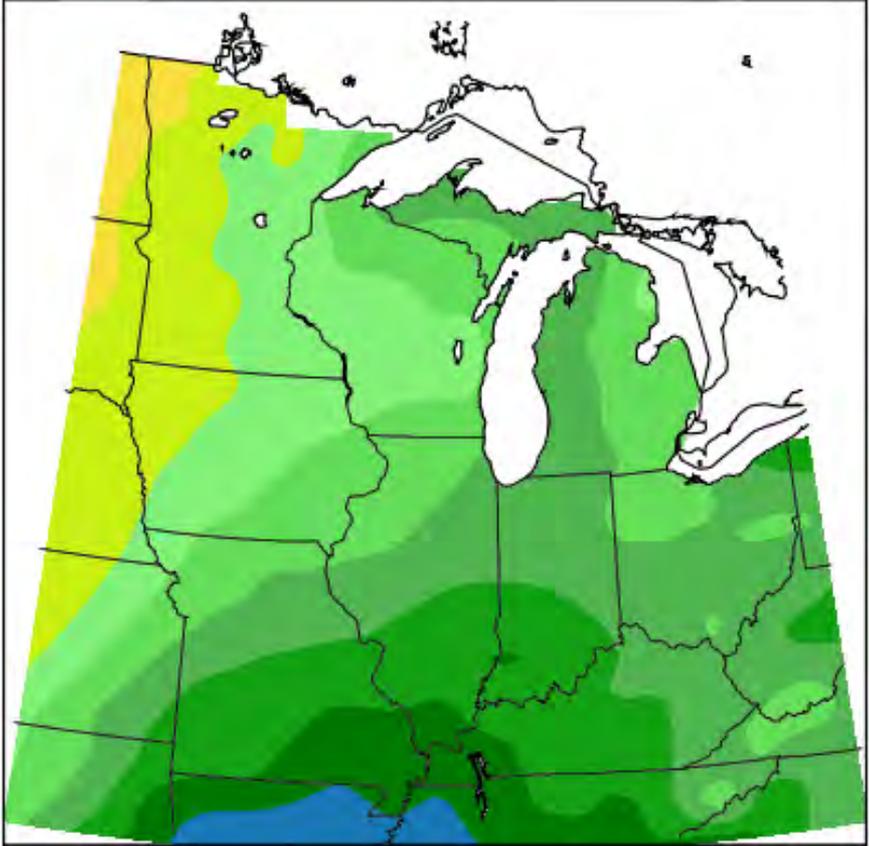
What kind of spring weather conditions will we have?



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

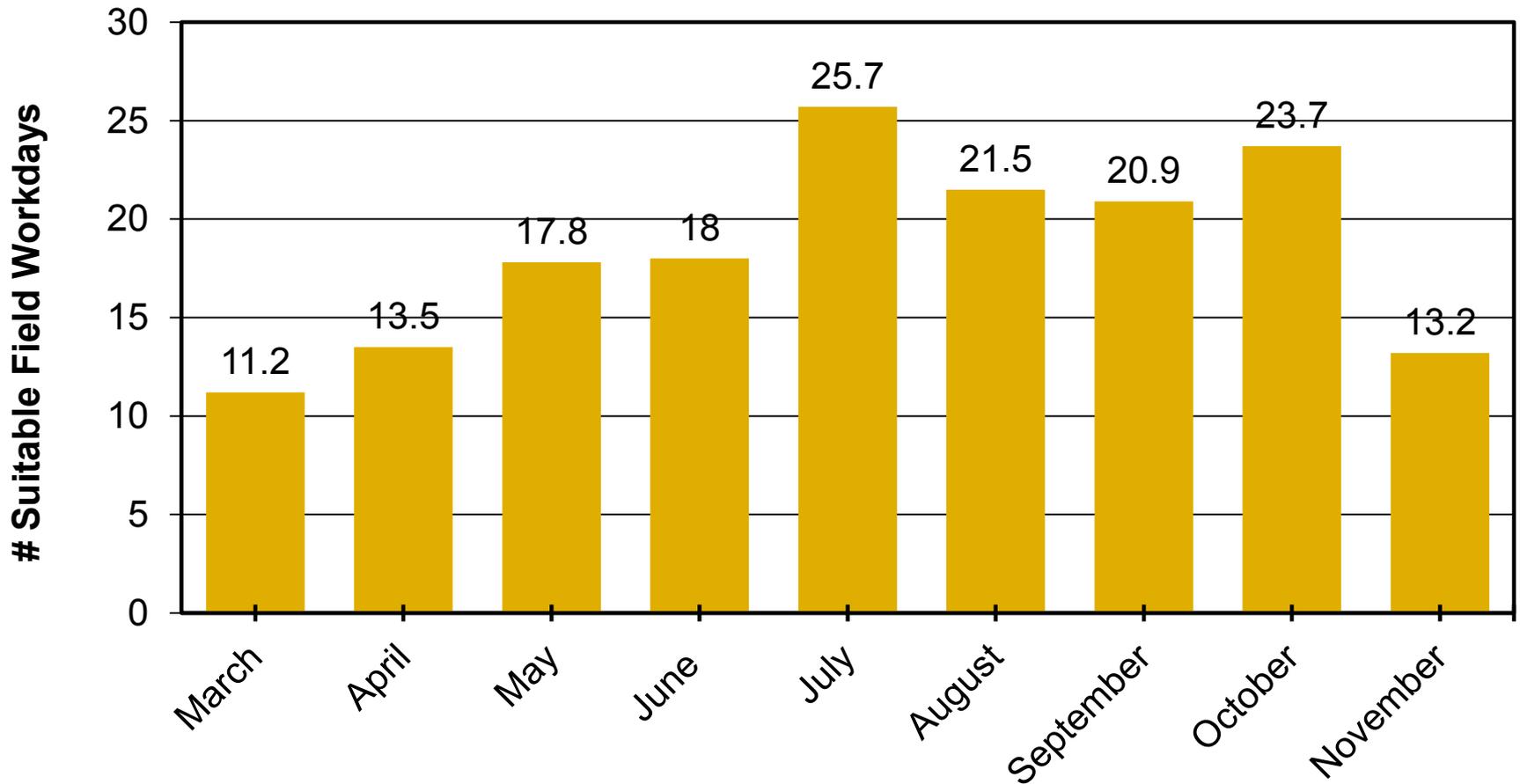


30-year average monthly precipitation, Oct-Nov (1981-2010)

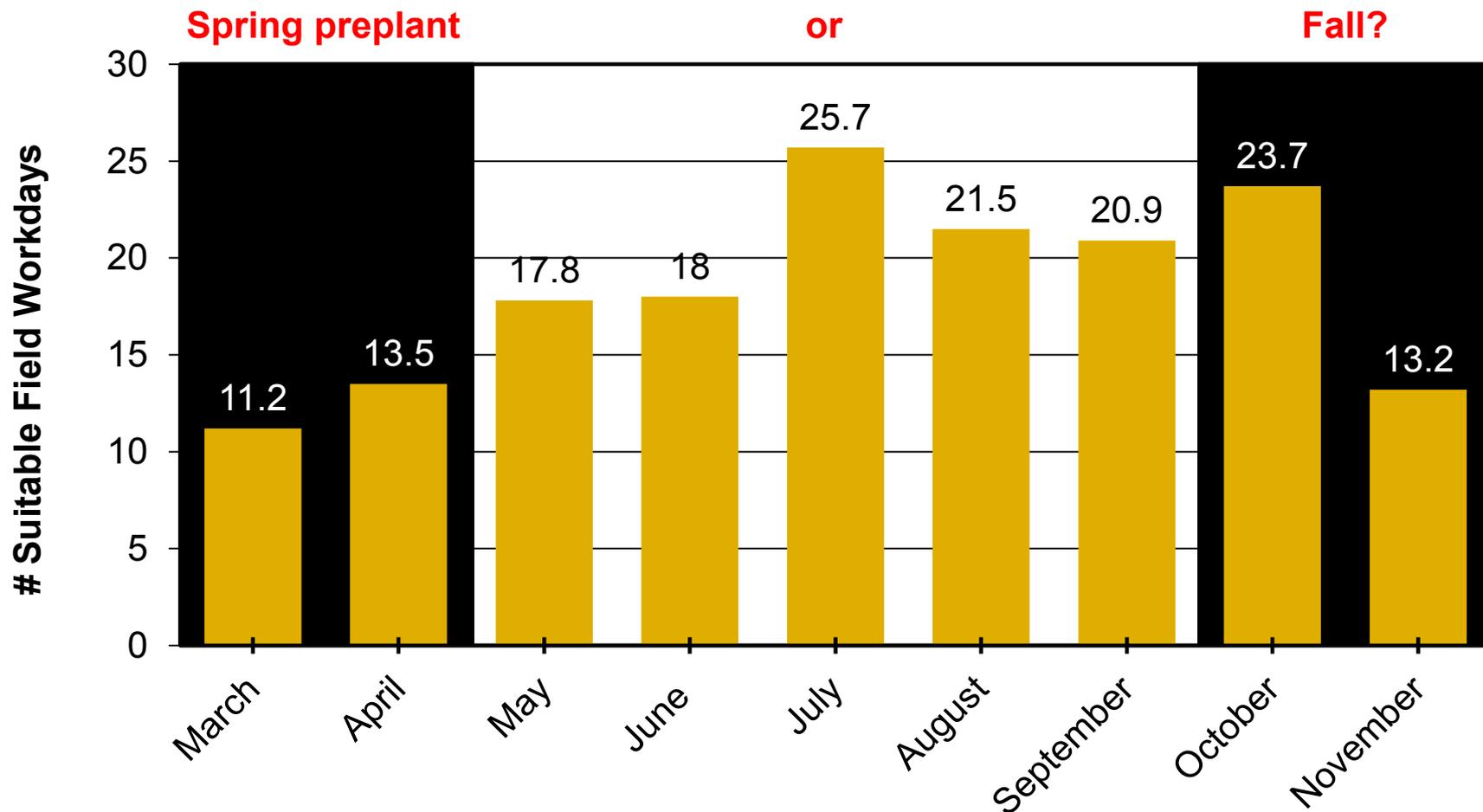


Source: Midwestern Regional Climate Center/Missouri Climate Center

Suitable Field Workdays in Missouri (30 year average)



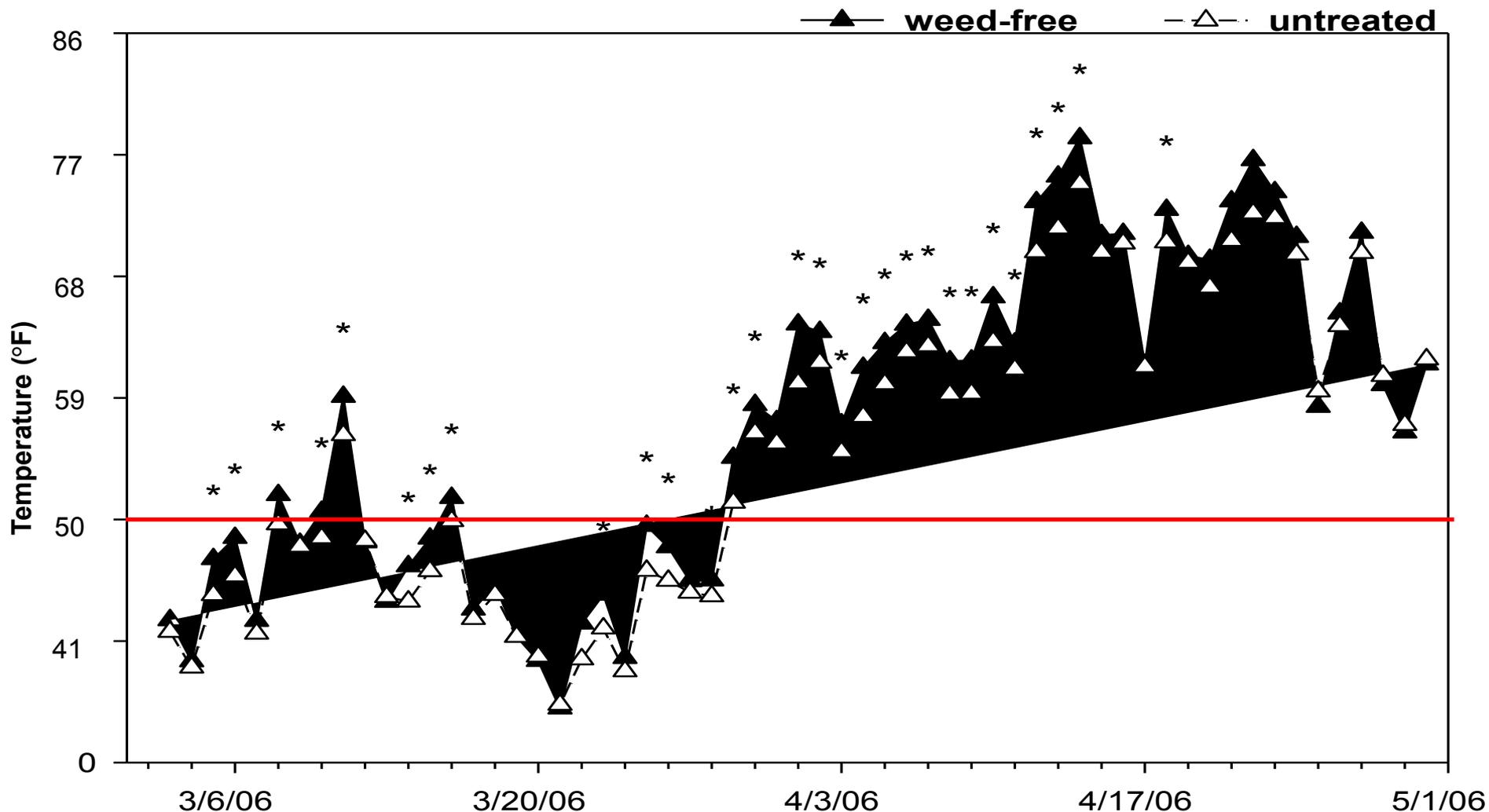
Suitable Field Workdays in Missouri (30 year average)



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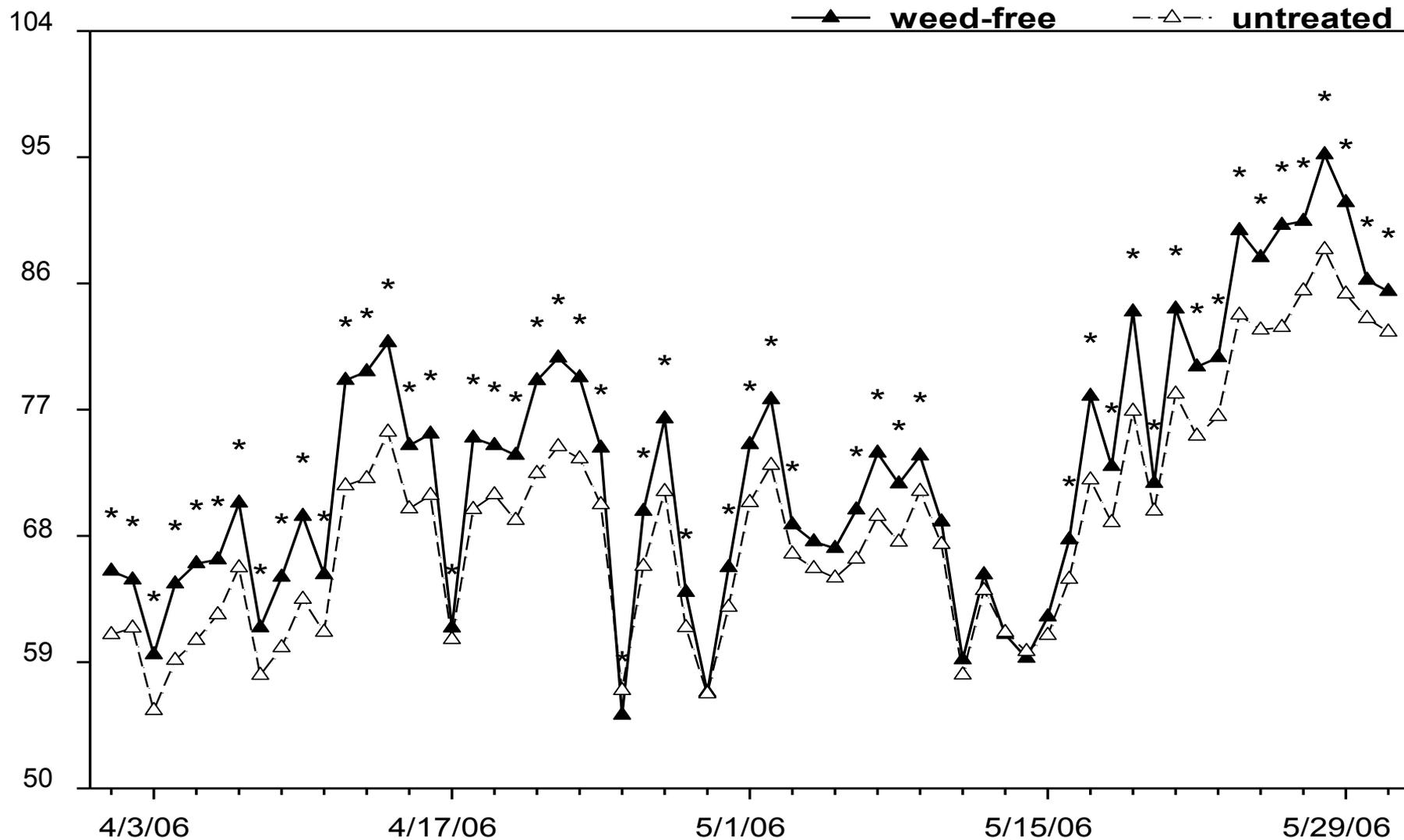
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Influence of Winter Annual Weed Removal with a Residual Fall Herbicide Application on Soil Temperature Prior to Corn Planting



*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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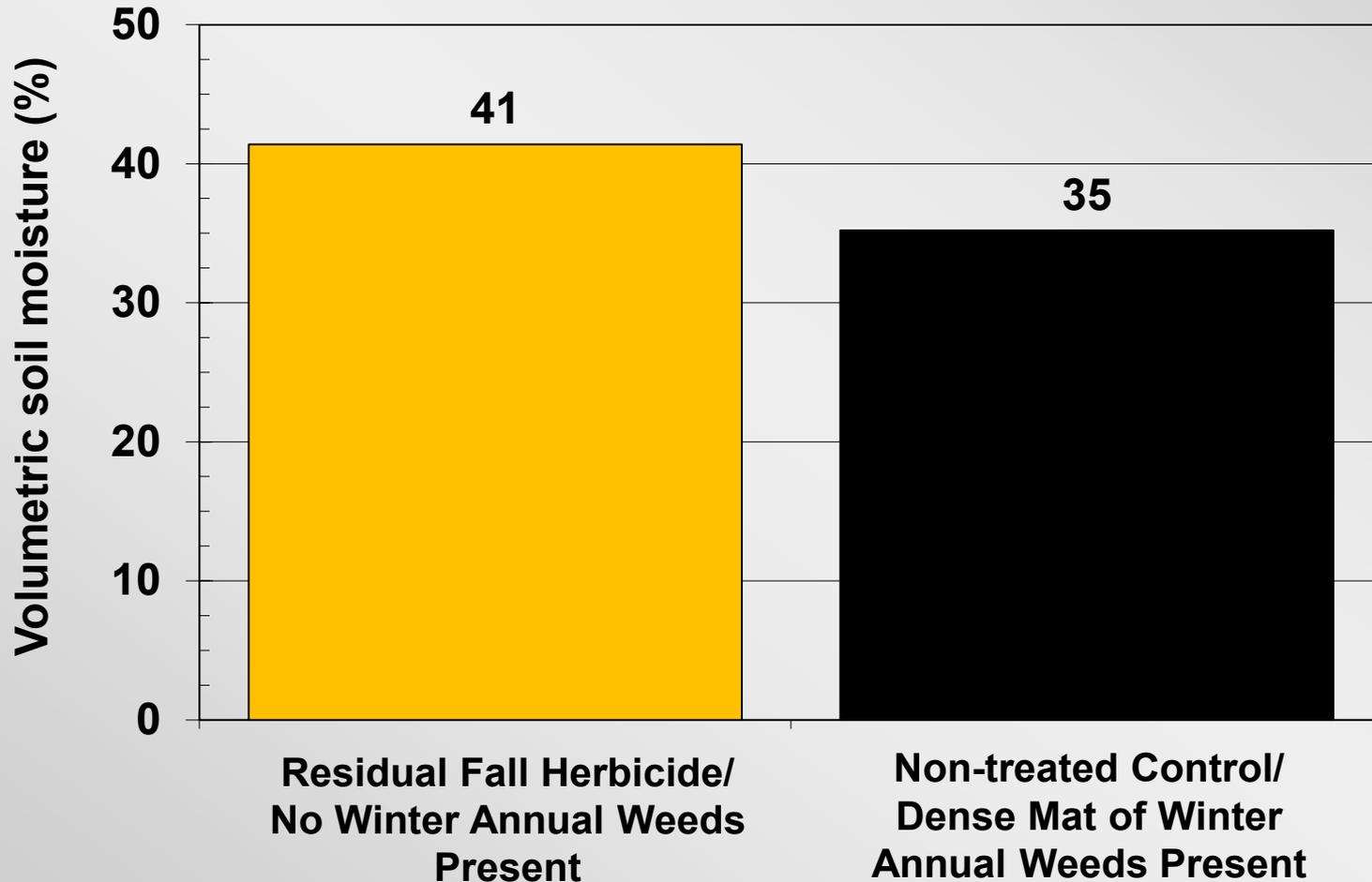


Summary of Effects of Winter Annual Weeds on Soil Temperature

(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



Winter Annual Weed Hosts of SCN

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.



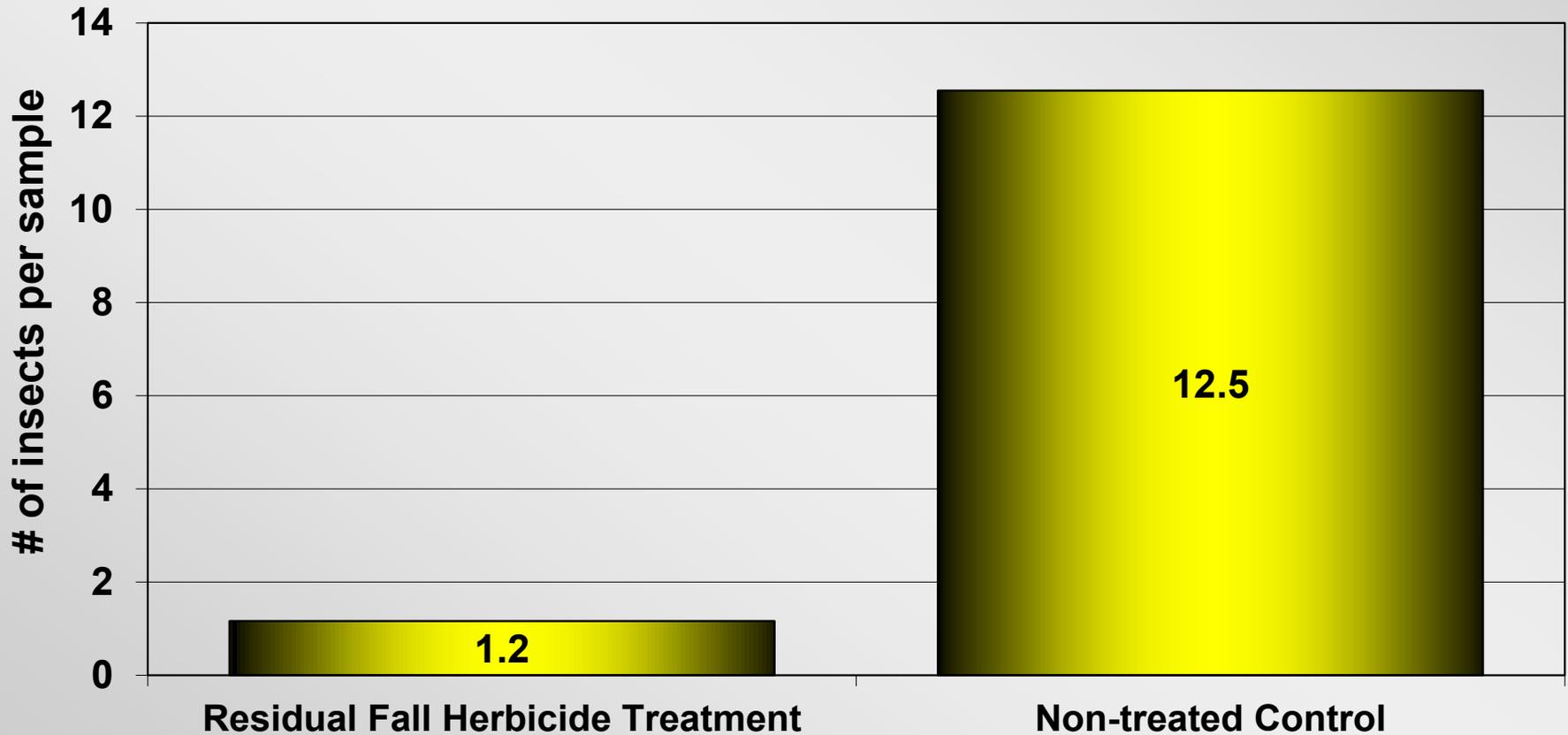
Other Insect Interactions:

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)



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Weed Management Considerations of Fall Herbicide Applications:



Weed Management Considerations of Fall Herbicide Applications:

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

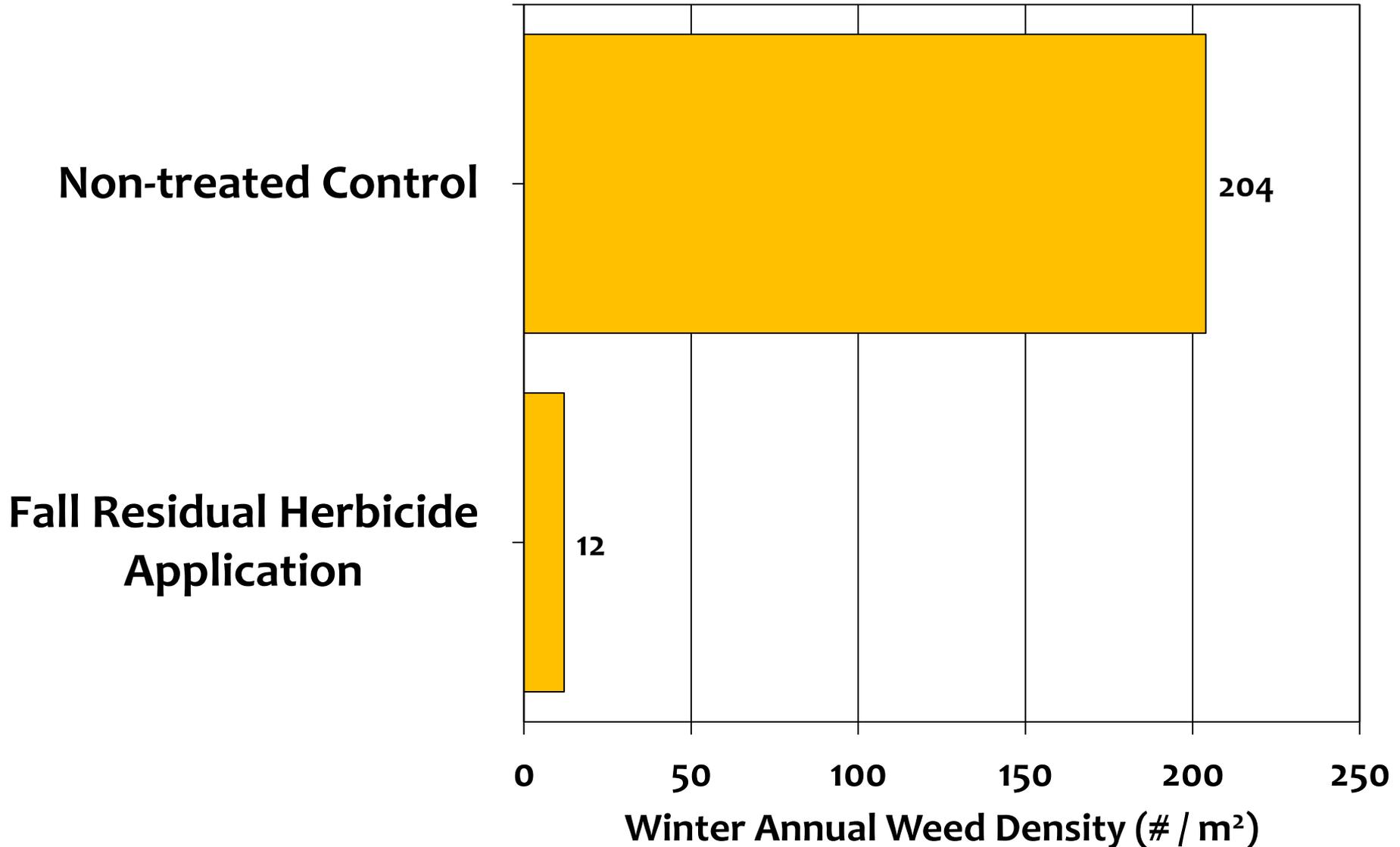
Non-residual programs like glyphosate+2,4-D only provide control of winter annual weeds present at the time of application, but offer no control of weeds that may emerge after the initial application. **RESIDUAL** herbicide programs are required to ensure control of **ALL** winter annual weeds that may 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:	DEFINITELY
Giant Ragweed:	LITTLE to None
Waterhemp:	Even less to NONE



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?

