Improving perennial weed management in my burndown program

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Why do we use burndown herbicide treatments?

- CROP
  1. **Prevent competition during crop emergence/establishment**
  2. Delay weed development
     - later POST application timing

- WEED
  - Prevent weed population increases
    - Perennial weeds
    - Winter annual weeds

What is the difference between winter and summer annuals?

- Winter annuals
  - germinate in the fall to early winter
  - Flower in early to mid spring

I Expect large populations of winter annuals this spring!

- Warm fall with periodic precipitation = germination of winter annuals

Chickweeds

Several species

- Opposite leaves
- Prostrate growth
- White flowers

- Common
  - Hairs along stem
- Mouse-eared
  - Hairy leaves and stems

Shepherd's purse

- Plants have mostly rosette leaves
  - Lobed to highly divided
- Flowering stem with few leaves
  - White flowers with 4 white petals
  - Heart-shaped fruits

Field pennycress

- Leaves
  - margins wavy to serrated
  - clasp stem
  - Bitter/garlic smell when crushed
- Flowers/fruit
  - White with 4 petals
  - Seed pods size/shap of dime with a notch

Managing winter annuals
"the good news"

- Wide range of products are effective and economical
  - Glyphosate alone or in conjunction with 2,4-D highly effective
    - Many other products effective
- Applications in fall or spring are effective
  - Results from fall consistently the best
    - Germination ceases in September/October
  - If spring apply early

Can I improve perennial weed management with my burndown treatments?

- Possible but we have challenges in our northern climate
  - Timing specific
  - Species specific issues

“Top Ten” perennial weeds in corn/soybean

- Calculated by results from surveys of weed populations in corn/soybean fields in Wisconsin
  - Recker (2012-13)
  - Fickett (2008-9)

TOP 10 Perennial Weeds in WI	
Common dandelion	Canada thistle
Yellow nutsedge	White cockle/campion
Quackgrass	Field bindweed
White clover	Volunteer alfalfa
Plantain species	Horsetail (Equisetum)

Emergence timing of perennials is an important factor in suppression

Species	When do they emerge?
Common dandelion	April 1st
Yellow nutsedge	May 12th
Quackgrass	March 27th
White clover	Late March - early April
Plantain species	April 11th
Canada thistle	May 1st
White cockle/campion	April 2nd
Field bindweed	April 29th
Volunteer alfalfa	Late March - early April
Horsetail (Equisetum)	May 1st

These perennials can be controlled by burndown trts

Species	When do they emerge?	Timing recommended
Common dandelion	April 1st	Fall or late spring
Yellow nutsedge	May 12th	In crop or late summer
Quackgrass	March 27th	Fall or late spring
White clover	Late March - early April	Fall or late spring
Plantain species	April 11th	Fall or late spring
Canada thistle	May 1st	Fall
White cockle/campion	April 2nd	Fall or late spring
Field bindweed	April 29th	In crop or late summer
Volunteer alfalfa	Late March - early April	Fall or late spring
Horsetail (Equisetum)	May 1st	In crop or late summer

These perennials emerge late and likely won't be effectively controlled by burndown trts

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To maximize control of herbicides on perennials:

1. Maximize herbicide absorption (plant)

2. Maximize translocation (movement) of the herbicide into the root/ perennial organ

Maximizing absorption in burndown applications

- Foliar uptake
  - Treat when maximal foliage is present
  - Treat when conditions promote uptake
    - Not drought stressed
    - Leaves not dead
    - Temps above 50F
- Root uptake
  - Treat when roots actively absorbing nutrients/ water

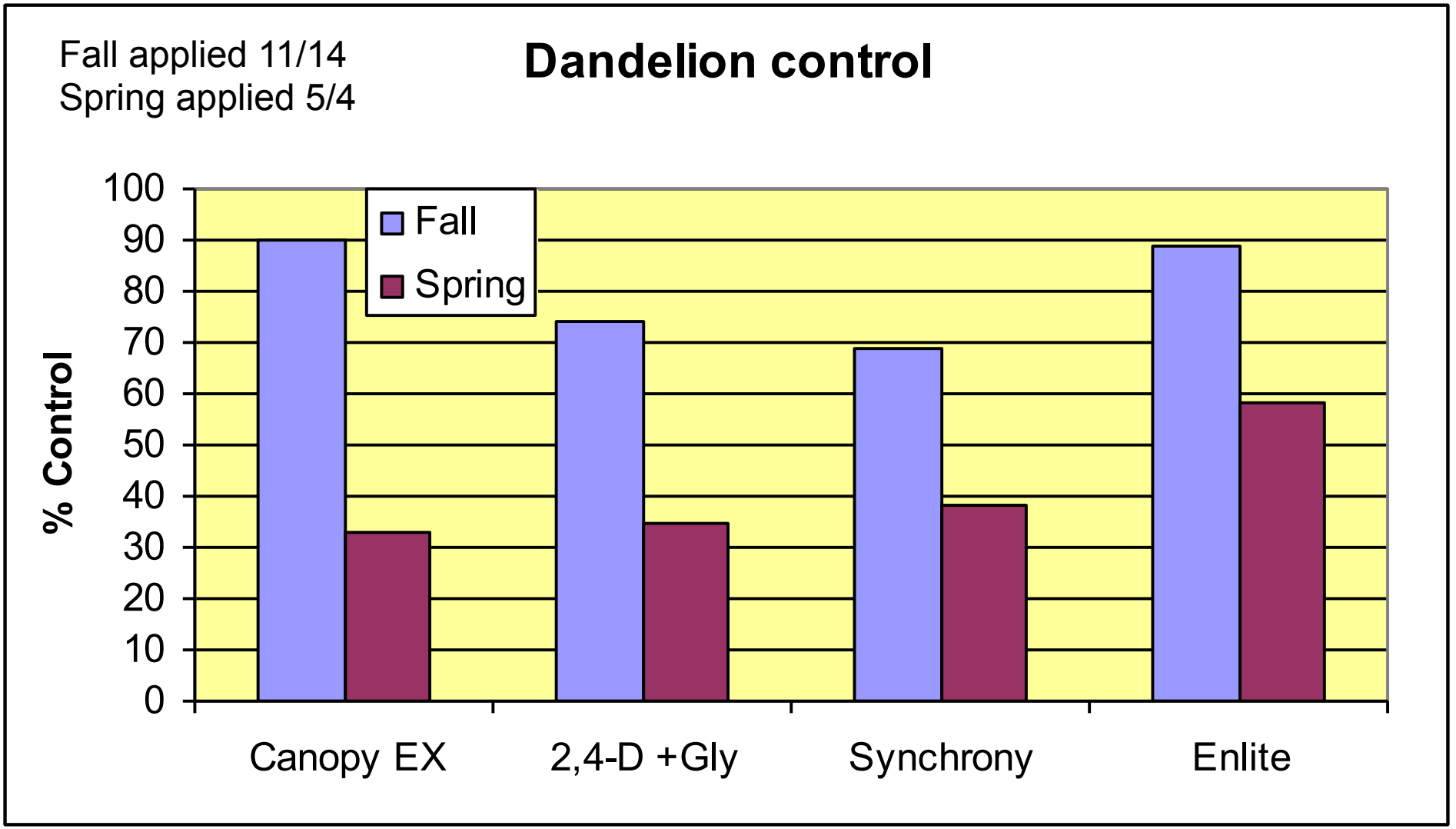
Maximizing translocation of foliar applied herbicide in burndown applications

- Phenology and species specific:

1. Flowerbud to early flowering
2. In fall to green tissue (resprouted)

- **WORST** timing is just after spring emergence

Spring or fall, which is the best time?

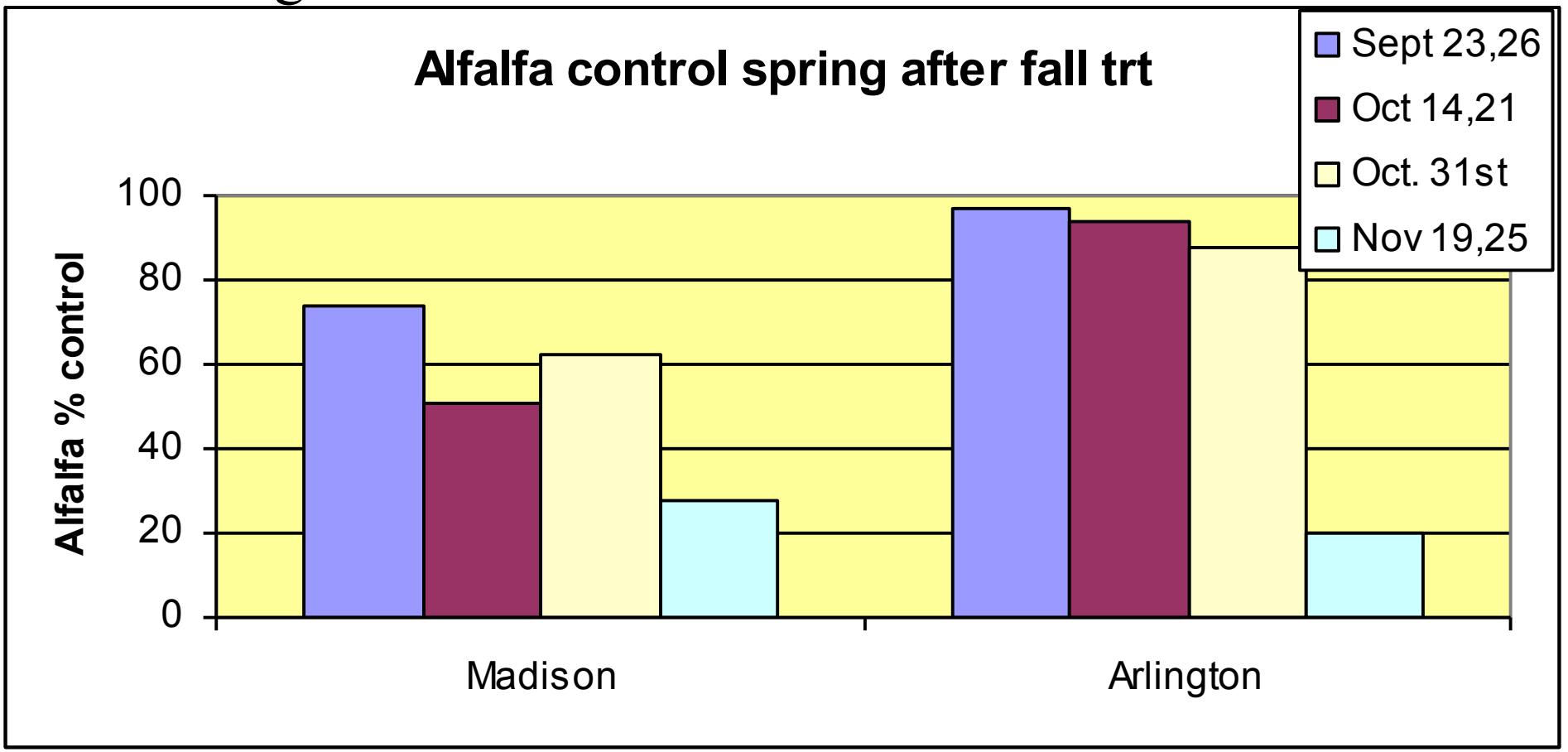


How late in the Fall?

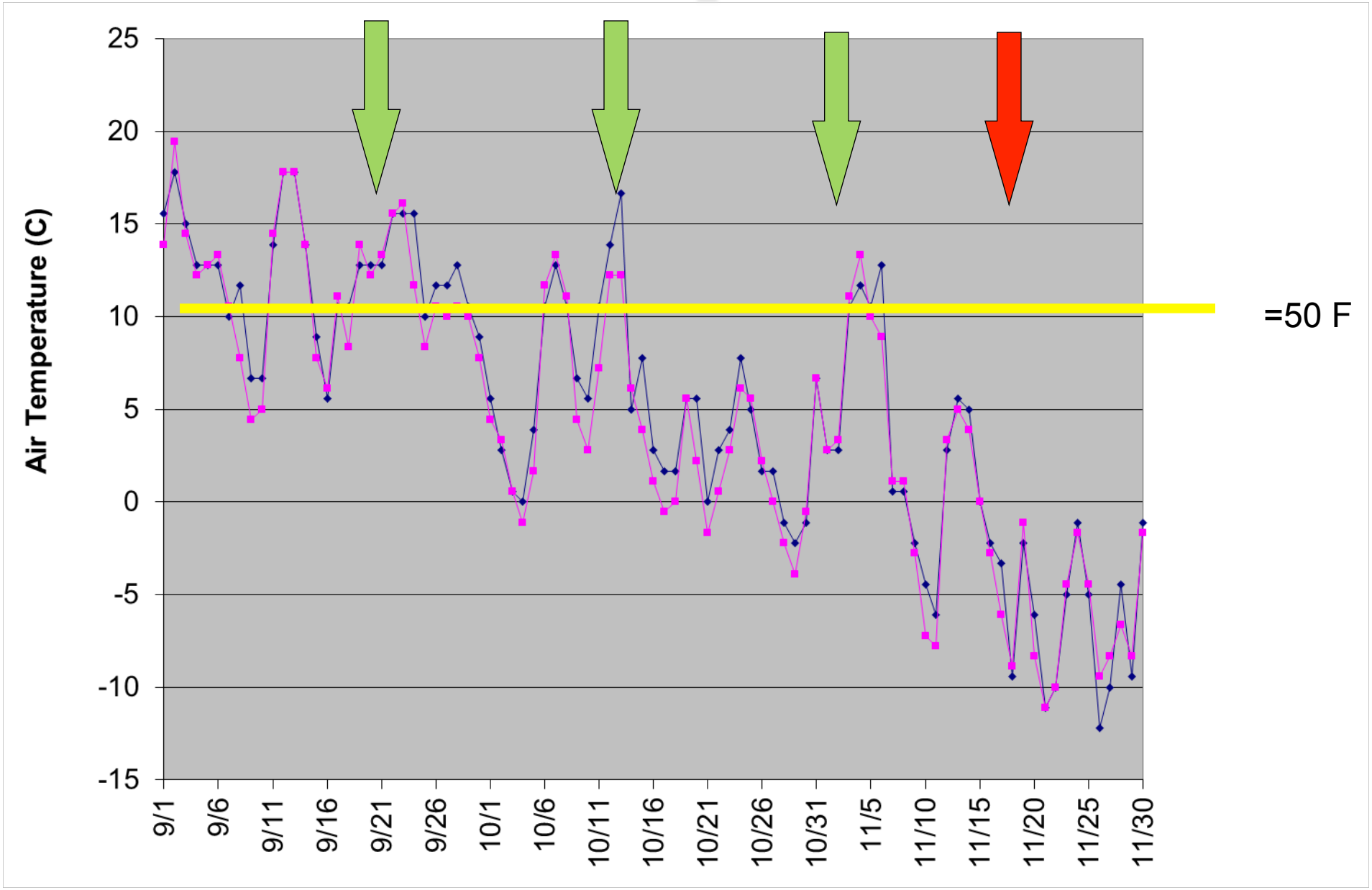
- Can vary based on:
  - Herbicides used
  - Air/soil temps
    - Before and after applications
  - Status of weed
    - Leaf area
    - Stress level
- We recommend making applications when temps can exceed 50F the day of application or 1-3 days after application

When in fall to treat?

- Alfalfa treated with 2,4-D (1 pint/A) at four timings in fall

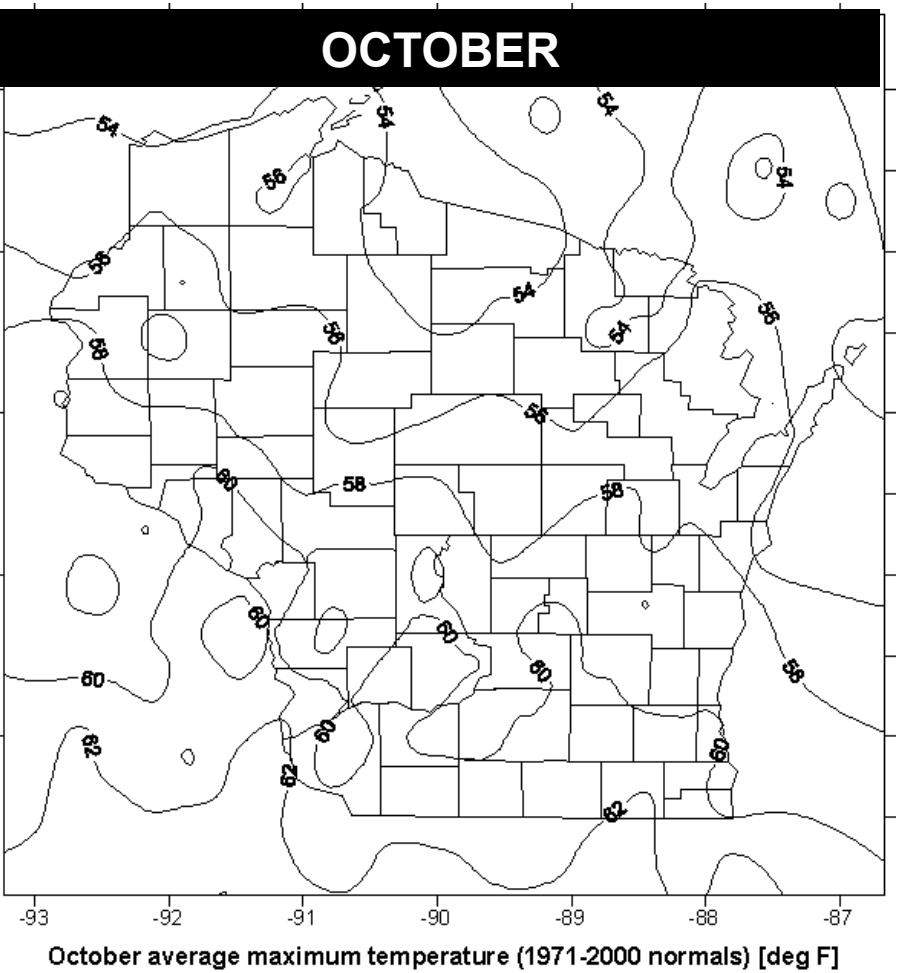


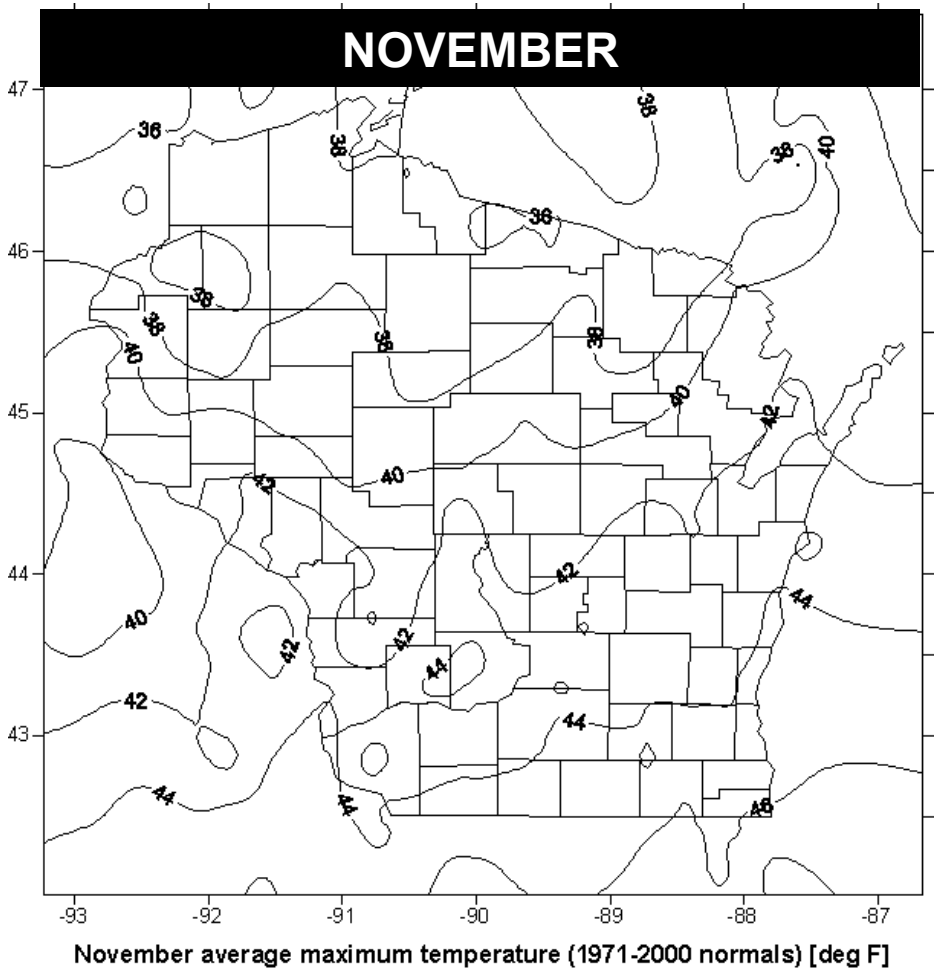
2008 Temperatures



How late are temps >50F in WI?

Avg Max temp. 1971-2000





Courtesy of Wisconsin State Climatology Office

What to do if temps < 50F?

- Increasing rates can offset low temps.
  - Similar alfalfa termination if doubled 2,4-D rate when < 50F
- Some products can be root absorbed if ground not frozen
  - Roots remain active despite low air temps
    - Examples: Autumn, Canopy, Express
- Wait until spring

Things to consider if using a spring burndown

- Have the perennial weeds emerged?
  - Need considerable foliage present when treating
    - leaves fully expanded and actively growing
    - The weedometer can identify emergence
      - (http://weedecology.wisc.edu/weedometer/)
        - » Enter location, Specie(s) of interest

Make a Speedometer | Change My Location | Chart Multiple Species

Quackgrass

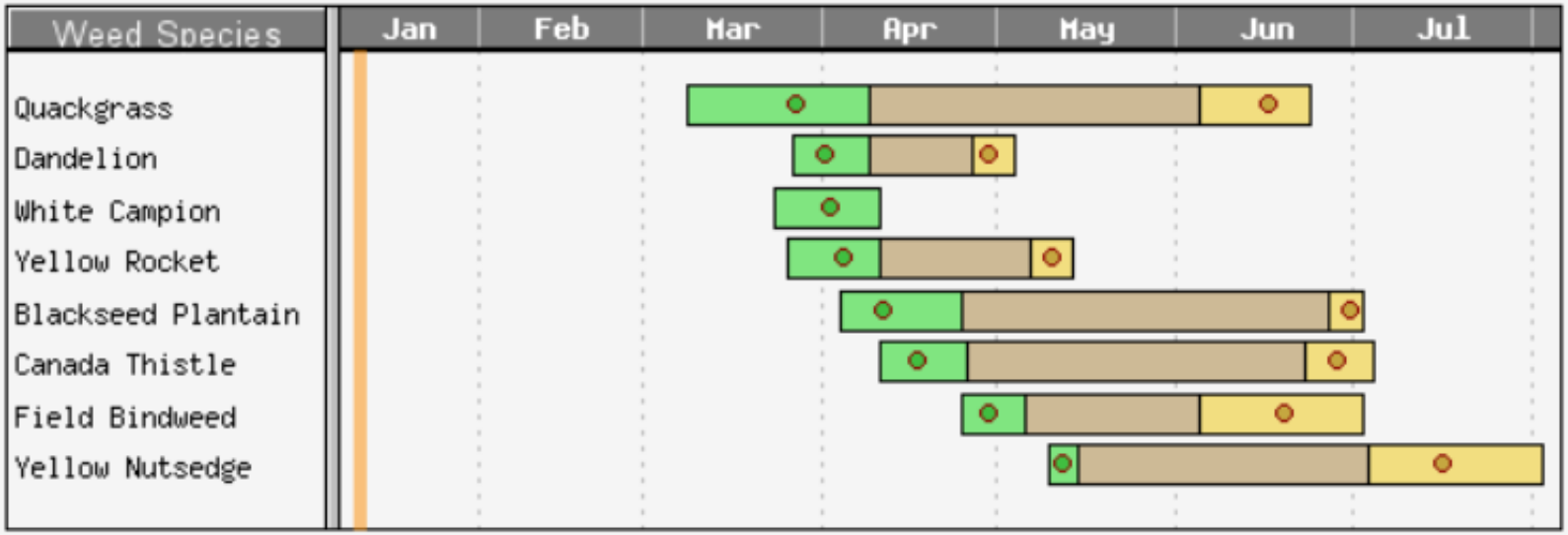
WI::Arlington

Current location set to:
Arlington, WI

Barnyardgrass
Blackseed Plantain
Buffalobur
Bull Thistle

Weed Life Cycle Event Timing, Multi-Species Gantt Chart

Extrapolated to Arlington, WI, using Hopkins' Law



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- What is the plant-back restriction of the product?
  - Few products have no restrictions

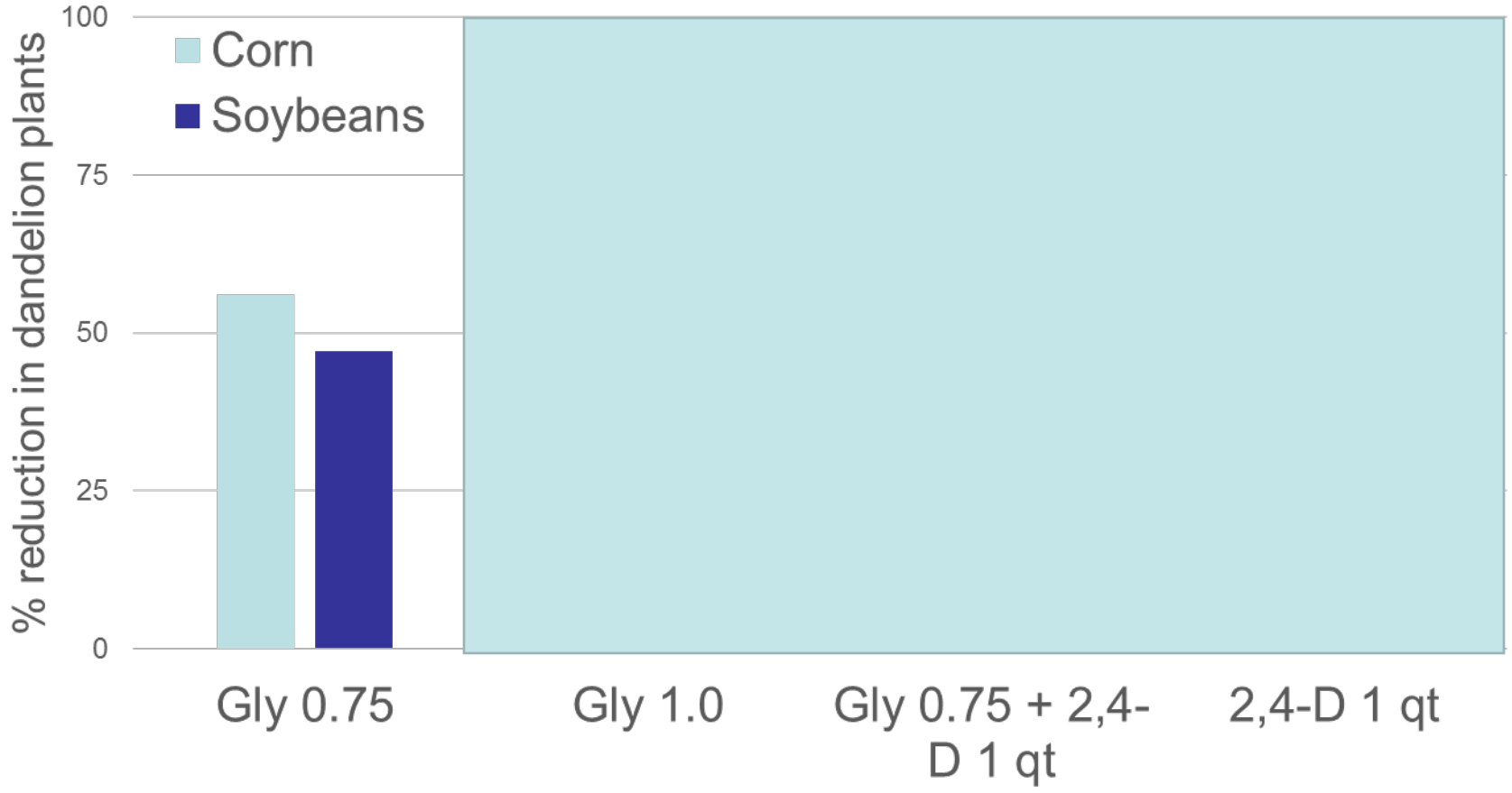
Long-term dandelion control from spring burndown

- Burndown demo (Dan Heider IPM)
  - Applied Gly, 2,4-D, and combinations as burndown trts (5/20) into
    - Continuous corn and soybean plots
    - Planted 2 weeks after trt

- Measurements
  - 30 DAT all herbicides = 100 % dandelion control
  - 65 DAT (7/25) counted regrowing dandelions

Effect of spring burndown on dandelions in July

65 DAT



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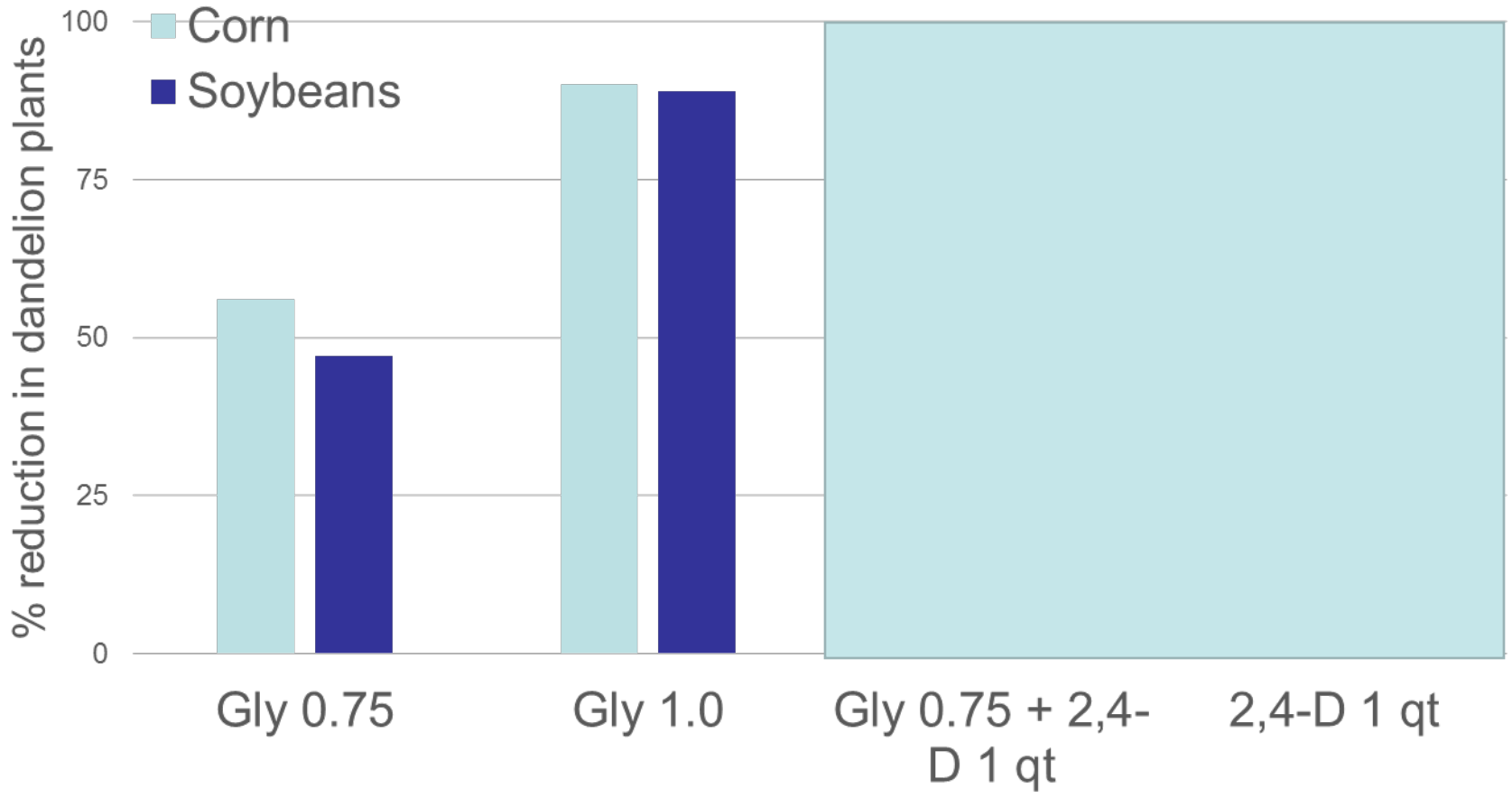

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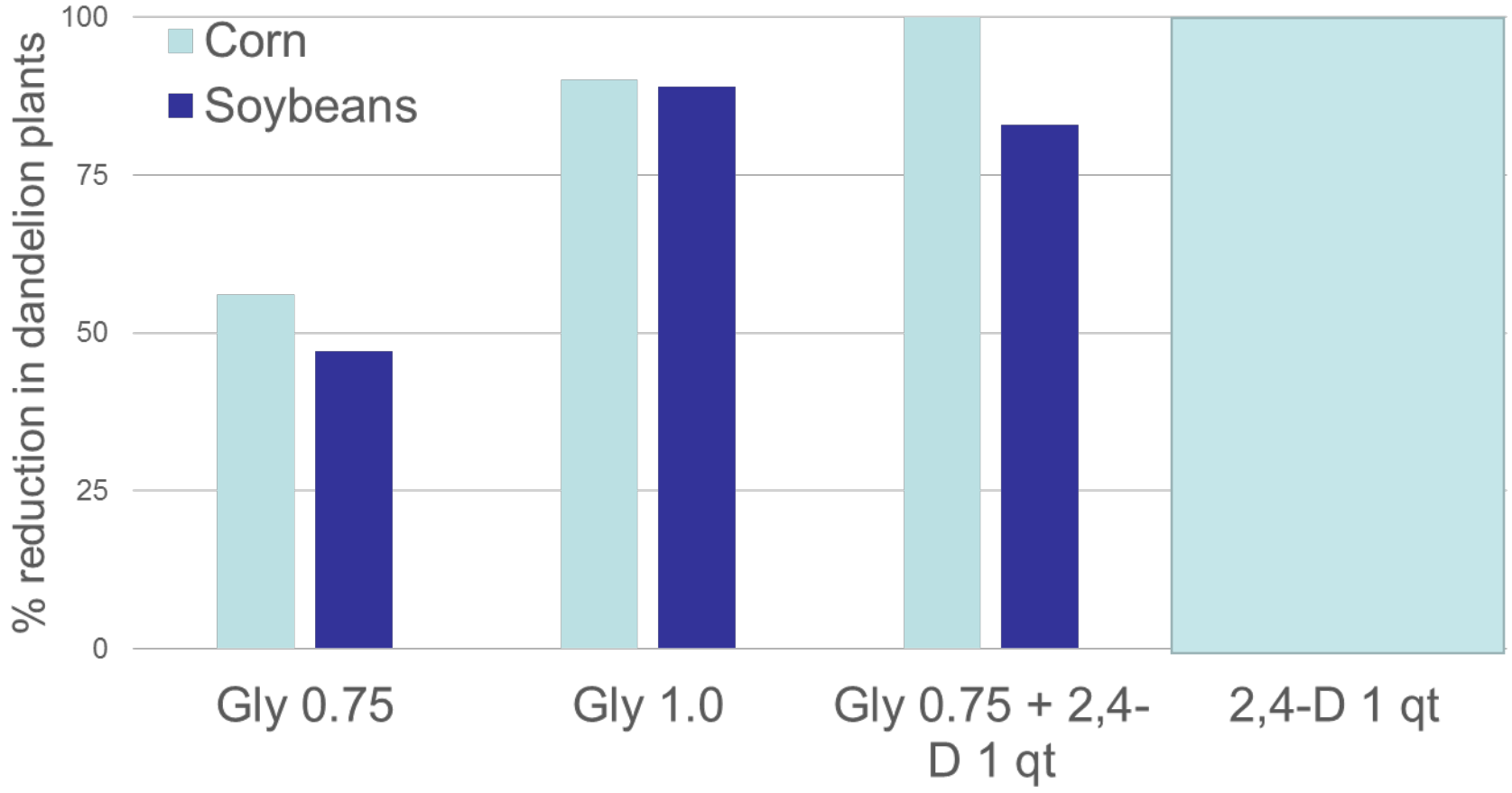

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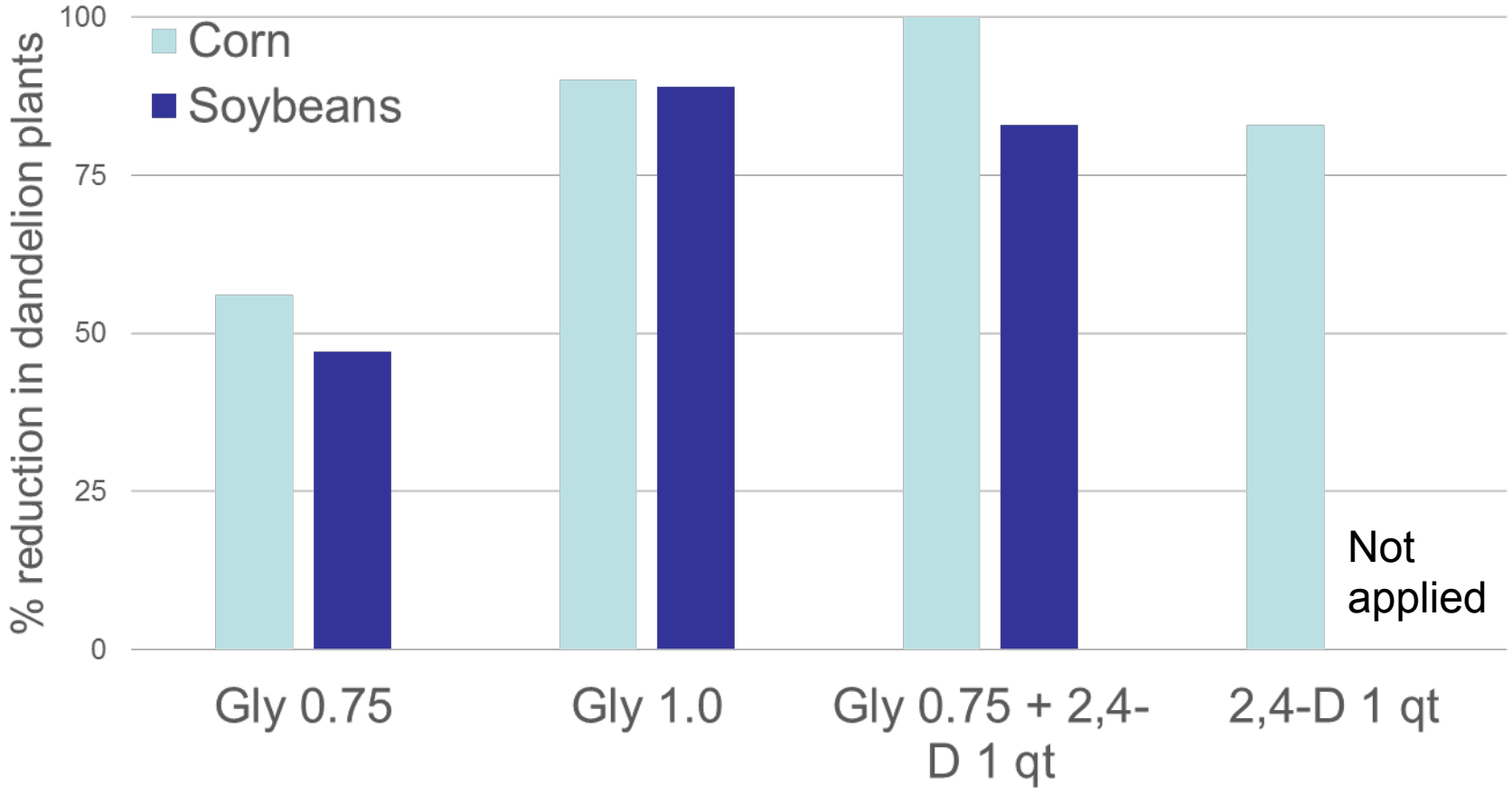

Are other herbicides available besides glyphosate & 2,4-D?

- **Yes** but effectiveness is specific to the weed species and time of application
  - Some applied late into fall are effective
    - Example: Autumn
  - Typically still tank mixing other products
    - Example: Basis recommends 2,4-D
  - Generally similar in cost to gly + 2,4-D
- Need to follow
  - Plant-back restrictions
  - Geographic use restrictions
  - Rate restrictions

Tricks to increasing burndown activity with perennials

1. Scout the field
   - Know weed species
     - Time applications based on growth
2. Utilize fall applications when possible
   - Apply when temps >50F or increase rates
   - Use products absorbed by roots
3. If spring delay appl. as long as possible
   - Increase the rate of glyphosate
   - Consider adding growth regulator (e.g. 2,4-D)
4. If late emerging manage in crop


Questions?

Effects of spring glyphosate on established dandelions (3 WAT)

An example in Alfalfa

thinning stand of RR alfalfa

- Fall (11/4/14) vs spring (4/25/15)
- Herbicides: glyphosate
  - 1 lbs ae/A (29 fl oz/A roundup pmax)
  - 1.5 lbs ae/A (44 fl oz/A roundup pmax)
- Initial cover
  - Fall = alfalfa 50-60% , 30% dandelions
  - Spring = alfalfa 45-50% , 25% dandelions

How well did treatments control **established** dandelions?