

Summer 8-18-2020

## **2020 Pesticide Safety August 18: Zeus, Callisto and Clethodim**

Katherine Ghantous

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# Zeus, Callisto, and Clethodim

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Katie Ghantous - UMass Cranberry Station  
August 18<sup>th</sup>, 2020



- 24c (Special Local Needs Label) new for 2020
  - First field use in cranberry
- For control of moss and other susceptible weeds

# Zeus XC Use Patterns

Zeus XC is active in the soil

- Needs to be watered in (if no rain or frost protection) after application

Apply prior to cranberry breaking dormancy (sp

- Use spring dormant through cabbagehead, **BUT** recommended to apply before the cabbagehead stage

# Zeus XC - sulfentrazone

- Group 14 herbicide (new group for cranberry)
- PPO inhibitor
  - Blocks an enzyme plants need to make chlorophyll
  - Toxic molecules build up inside plant cells that destroy cell membranes

# Most common and “weedy” mosses in MA cranberry



**Haircap**  
(*Polytrichum commune*)



**Sphagnum**  
(Multiple *Sphagnum* spp.)

# Sphagnum



- “Peat mosses”, 300+ species
- Lack root-like rhizoid structures
- Specialized cells covered with pores to absorb water and hold it like a sponge
- In cranberry, found in wet areas
  - bed and ditch edges
  - areas w/drainage problems and high soil moisture

# Haircap Moss

(*Polytrichum commune*)



- Stems are attached to the soil by rhizoids (structures that resemble roots)
- Found in diverse habitats
- Can be interconnected underground creating large clonal patches
- Can reproduce vegetatively from buds on the rhizomes, or by spores that result from sexual reproduction
- In cranberry, can be widespread



# Zeus XC Efficacy on Moss

- Some effects apparent within a month of treatment, but full effects can take months to develop
- Worked faster on sphagnum than haircap moss
- Treated haircap moss did not make reproductive structures

Haircap moss – initially, moss looks smokey/dusty



# Untreated Moss on State Bog

## Treated 4/15/20

**1 Month after Zeus**

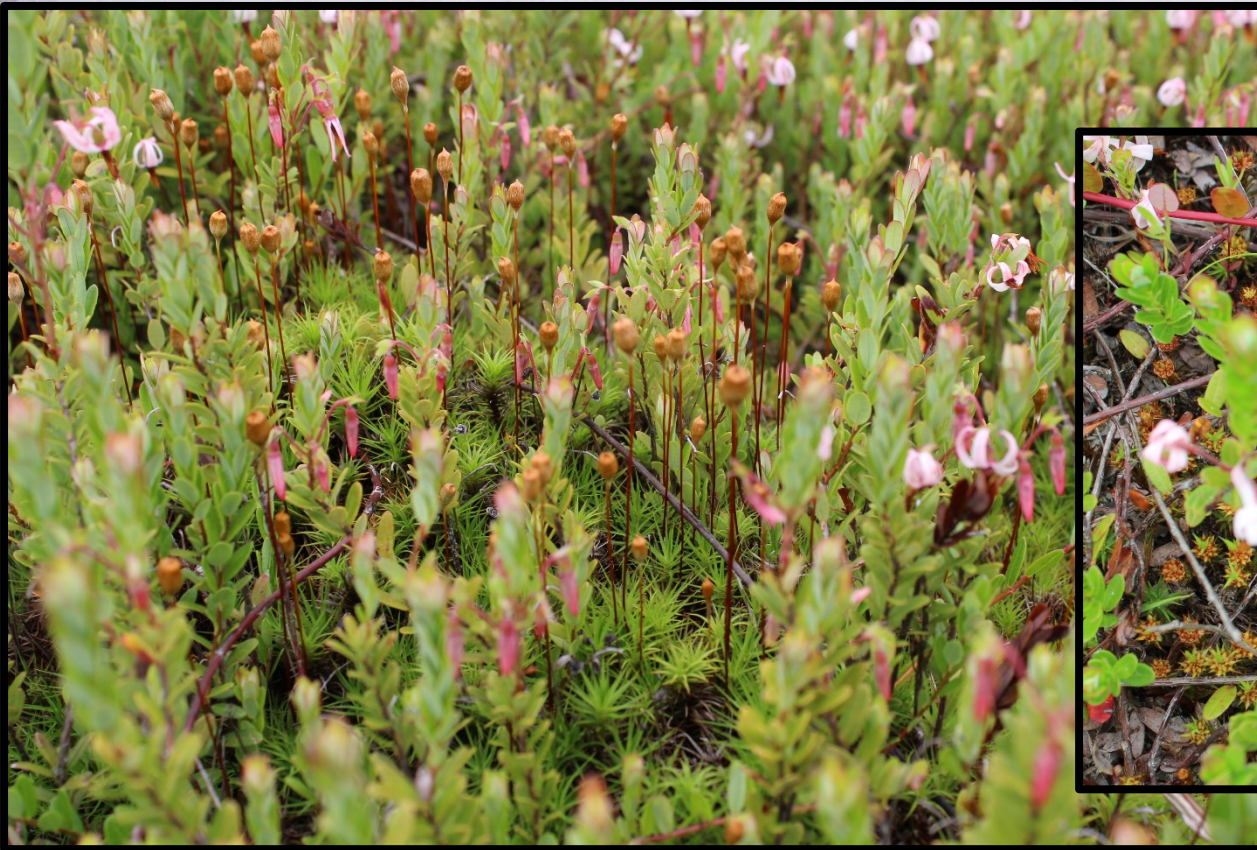


**2.5 Months after Zeus**



# Untreated Moss on State Bog (6/25/20)

## Haircap moss lush and making spores



# Lasting control on haircap 5 months after treatment

**Untreated**



**12 oz Zeus**



# Sulfentrazone works on other weeds

- Annual grasses (stops seeds from germinating)
  - Lots listed on product label like crabgrass
- Some perennial grasses (stops seeds from germinating)
  - In our greenhouse trials like little bluestem (one of the “poverty grasses”) and deer-tongue grass in our greenhouse trials (but not broomsedge)
- Dodder (GH trials)
- Sedges (listed on label)

# Zeus on new planting?

Needs research to determine if it is safe.



# Concentrated Callisto for Spot-Treatments

- 1 – 1.5 oz per gallon water + COC or NIS
- Tough weeds (like poison ivy and dodder) that are not controlled by broadcast apps of 8 oz/A
- Spray “to wet”

\*24c for this use is for Callisto brand only



# Timing for Poison Ivy

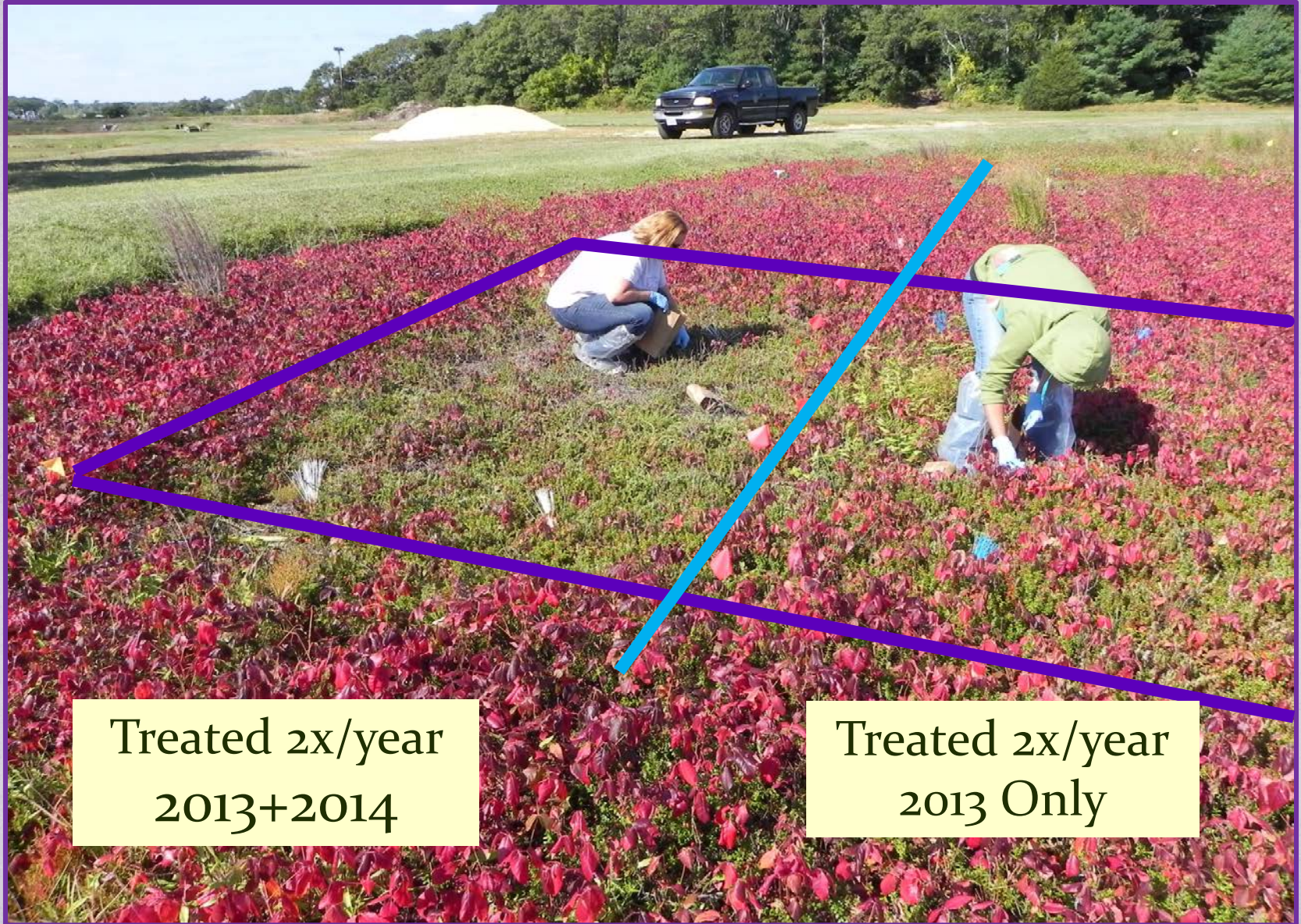


PI has large underground rhizomes, lot of stored energy to overcome injury

Best results with two applications per year

- Mid-June + early July (min 14 days btw trts)
- PI fully leafed out for 1<sup>st</sup> treatment
- PI regrown leaves for 2<sup>nd</sup> treatment





Treated 2x/year  
2013+2014

Treated 2x/year  
2013 Only

# Dodder Spot Treatments

Callisto by chemigation for dodder (4 oz or 8 oz/A rate)

- Some report no control of dodder with chemigated Callisto
- Dodder shows signs of whitening but then recovers

Concentrated Callisto on dodder patches

(1.5 oz + 1.5 oz COC / gallon)

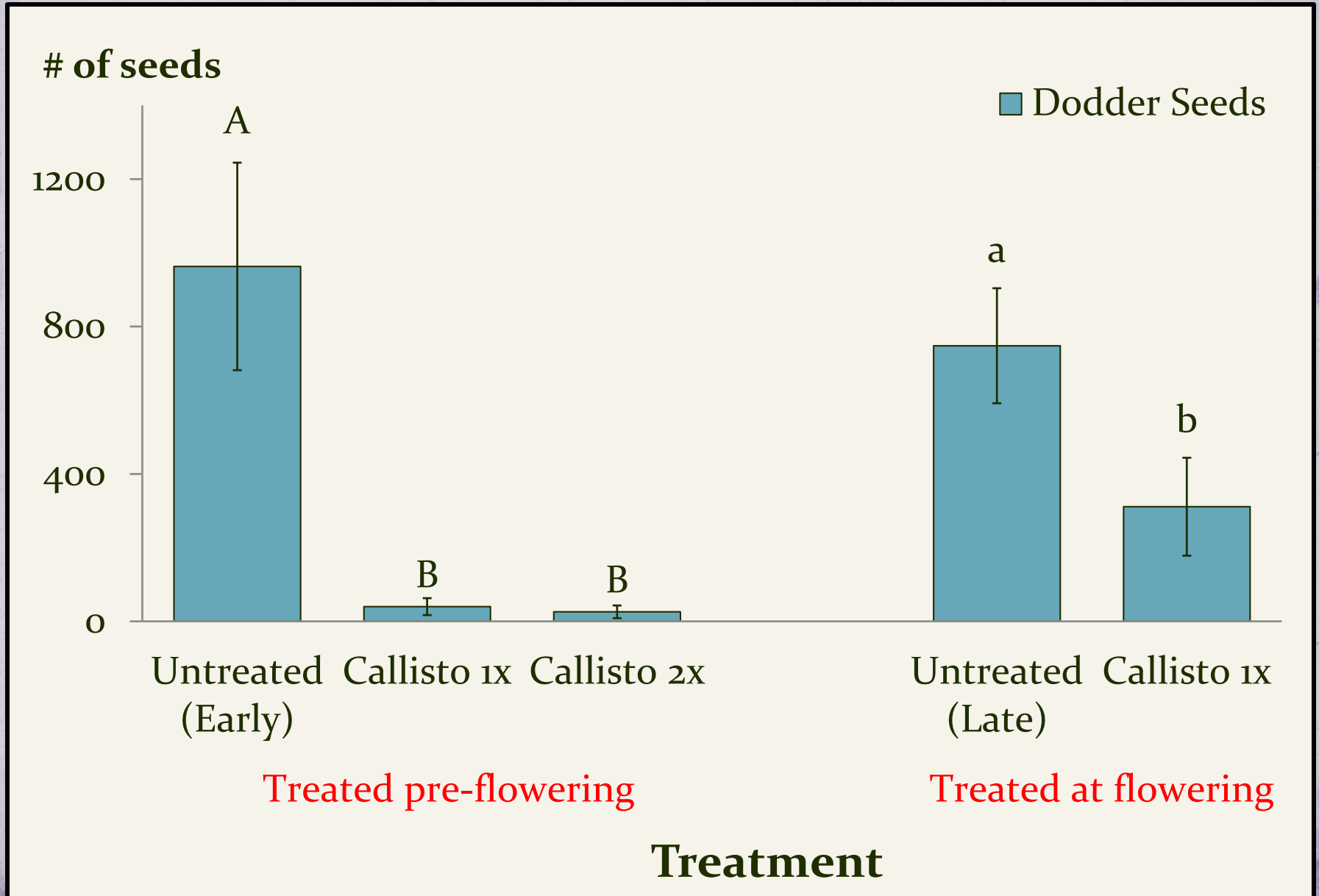
## Treatments

1. Prior to dodder flowering (7/7/14)
2. While dodder was flowering (7/29/14)
3. 2x - (7/7/14 and 3 weeks later on 7/29/14)
4. Untreated

6 Weeks after Pre-flowering Treatment



# More effective to treat dodder before it flowers!



## **DO NOT EXCEED 8 oz per acre per application** **(Callisto)**

- regardless of how you apply (spot or chem)
- e.g. if you use 1 oz/gallon for spot treatment, you can only use 8 gallons of solution per acre

## **DO NOT EXCEED 2 applications per year**

- Spot + Spot
- Chem + Spot
- Spot + Chem
- Chem + Chem

# Mesotrione

Enters plants by both foliage and roots

- Best mode of absorption may vary by weed species

Chemigation - 8oz/acre delivered in 400+ gallons

- Dilute, available to plant roots as well as foliage
- Studies show best for some weeds (i.e. nutsedge)

Spot treating - with concentrated rates

- Better foliar absorption
- Can work on tough weeds like PI that don't get any control by chemigation



# Mesotrione

More growers trying Callisto for preemergence spring application

- Reports of 4 – 8 oz/A working well as a PRE

The problem...

- We don't have many POST options.
- Use Callisto PRE, then you only have ONE app. left to use POST
- We do have other PRE options (like Devrinol) but they are expensive!

# Grass control

- Grass herbicides sethoxydim and clethodim work on grasses only
  - Is it really a grass, or sedge/rush?

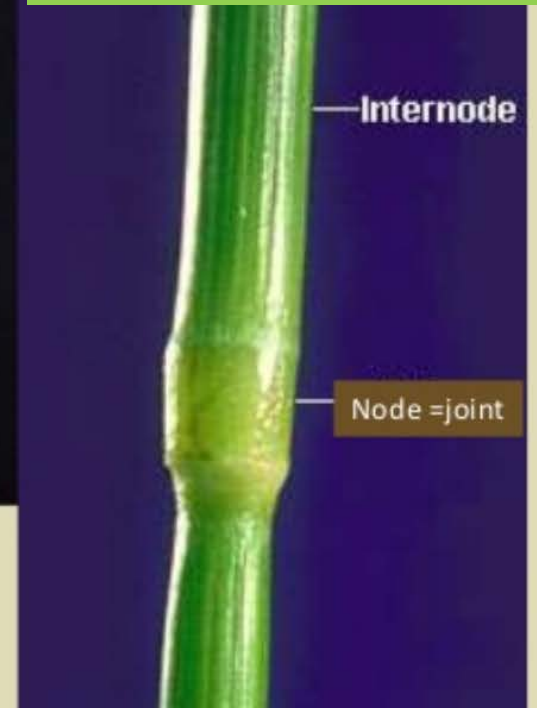
Sedges have edges



Rushes are round



Grasses have nodes/joints from their tips to the ground



# Can apply sethoxydim or clethodim multiple times per season

- Early season grasses, and later for species like PG and deer-tongue grass (apps min 14 days apart)
- Best on actively growing grass before flowers
- **Do not recommend** clethodim applications during roughneck!
- Use correct adjuvant with grass herbicides. Needed for efficacy
- **ONLY** Intensity and Intensity One can be chemigated



# Chemigating for Grass control

**Intensity** (26.4% a.i.) – 6 to 8 fl. oz/A

**VS**

**Intensity One** (12.6% a.i.) – 9 to 16 fl. oz/A

- Amount ACTIVE ingredient applied per acre is the same!
- Intensity One has less active ingredient per gallon, but has been formulated for better uptake by grasses.

**Both NEED and adjuvant to be effective!**

# Chemigating for Grass control

## Intensity or Intensity One

- Absorbed through the grass leaves
  - Very limited soil activity, not taken up by roots.
  - Use a short injection time to leave maximum product on the leaves.
- Use an adjuvant!
  - Nonionic surfactant recc. for Intensity One
  - Crop Oil Concentrate recc. with Intensity (but can use NIS)



**Questions?**