Weed management update for specialty crops

Jed Colquhoun, Dan Heider and Richard Rittmeyer
University of Wisconsin-Madison
Department of Horticulture

Weed management update for specialty crops

- Potential changes to diquat registration: implications for potato desiccation
- Life without linuron on coarse-textured soils
- Glyphosate resistant weeds: it's not just an agronomic problem in Wisconsin anymore

Potential changes to diquat registration

- Diquat has been a mainstay for potato vine desiccation for many years
- Every 15 years, EPA conducts product re-registrations
  - Human and environmental risk evaluated
- Draft risk assessment for diquat was published on September 25, 2015

Potential changes to diquat registration

- Potential label changes include:
  - Reduced application rate
  - Reduced number of applications and changes in interval between applications
  - Restricting applications to fall and winter months
    - Protection of avian reproduction
- Researcher and association comments were entered during public comment period

Life without linuron…

Lorox® DF

Agricultural Herbicide

APPLICATION DIRECTIONS

LOROX DF must be used in accordance with directions on this label. Injury to or loss of desirable trees or other plants may result from failure to observe the following application directions.

- **Do not apply by air.**
- **Do not apply to sand or loamy sand.**
- **Do not use on soils with less than 1% organic matter.**

FOR USE ON CARROTS IN CHEMIGATION SYSTEMS IN CALIFORNIA

Follow the use direction in the section above and the chemigation instructions in the Chemigation section of this label.

For solid set and hand move irrigation systems, apply LOROX DF at the beginning of the set and then apply 1/3 to 1" of water for activation (sandy soils apply at least 1/3", sandy loams apply at least 1/2", silt soils apply at least 3/4", clay soils apply at least 1"). For center pivot and lateral move irrigation s systems, apply LOROX DF in 1/3 to 1" of water for activation as a continuous injection (sandy soils apply at least 1/3", sandy loams apply at least 1/2", silt soils apply at least 3/4", clay soils apply at least 1").

Carrot herbicide programs without linuron

Non-treated

Hand-weeded

Herbicide programs without linuron

Prowl H_20, Vegetable Pro, Vegetable Pro*

Dual Magnum, Vegetable Pro, Vegetable Pro*

* Vegetable Pro applied with 0.5% NIS. Ethotron not registered for use in Wisconsin carrots. Read and follow the label prior to use of any herbicide.

Herbicide programs without linuron

Prowl H_20, Ethotron, Vegetable Pro*

Prowl H_2O, Dual Magnum, Vegetable Pro*

* Vegetable Pro applied with 0.5% NIS. Ethotron not registered for use in Wisconsin carrots. Read and follow the label prior to use of any herbicide.

Herbicide programs without linuron

- Yield reduced compared to the hand-weeded check:
  - Dual Magnum or Ethotron applied PRE, followed by Vegetable Pro at 3- and 5-leaf carrots.
  - Presumably due to poor common lambsquarters control with PRE herbicides

Evaluation of PRE herbicides on nurse crops

- Dual Magnum (0.67 and 1.0 pt/a)
- Vegetable Pro (1.0, 1.5, 2.0, 3.0 and 4.0 pt/a)
- Prowl H_2O (1.0, 1.5 and 2.0 pt/a)

- Drilled oats, barley and winter wheat

- Evaluated nurse crop stand, injury and weed control

Nurse crops

Non-treated

Dual Magnum, 0.67 pt/a

Nurse crops

Dual Magnum, 1.0 pt/a

Vegetable Pro, 1.0 pt/a

Nurse crops

Vegetable Pro, 3.0 pt/a

Vegetable Pro, 4.0 pt/a

Nurse crops

Prowl H_2O, 1.0 pt/a

Prowl H_2O, 2.0 pt/a

Vegetable Pro/Caparol: field observations

- Compared to linuron:
  - More carrot injury potential
  - Takes longer for weeds to be controlled

- PRE:
  - 2.0 pt/a controlled ~85% of early redroot pigweed and common lambsquarters, but only ~50% or common ragweed
  - 3.0 pt/a controlled ~75% of common ragweed

Vegetable Pro/Caparol: field observations

- POST: carrots with a leaf or less most susceptible
  - Use the correct surfactants and rates with POST applications
  - Be a bit patient on weed control
- Oat nurse crops:
  - PRE rates at 3.0 or 4.0 pt/a significantly reduce growth
  - Post applications at 2.0 pt/a may injure oats, but they recovered in 2015

Field observations

Carrot cultivar competitiveness

Spring M.

SFF

Carrot cultivar competitiveness

Spring M.

SFF

Glyphosate resistance update

- Common waterhemp:
  - Eau Claire County: 10x resistance
  - Pierce County: 13x resistance
- Palmer amaranth:
  - Dane County
- Previously identified:
  - Giant ragweed
  - Horseweed

Figure 1. Comparison of ten susceptible plants versus ten Dane County Palmer amaranth plants. Pictures taken at 21 days after application.

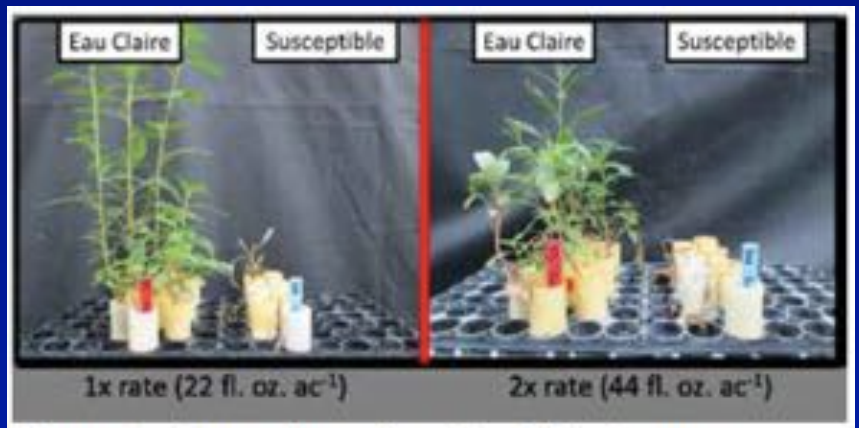
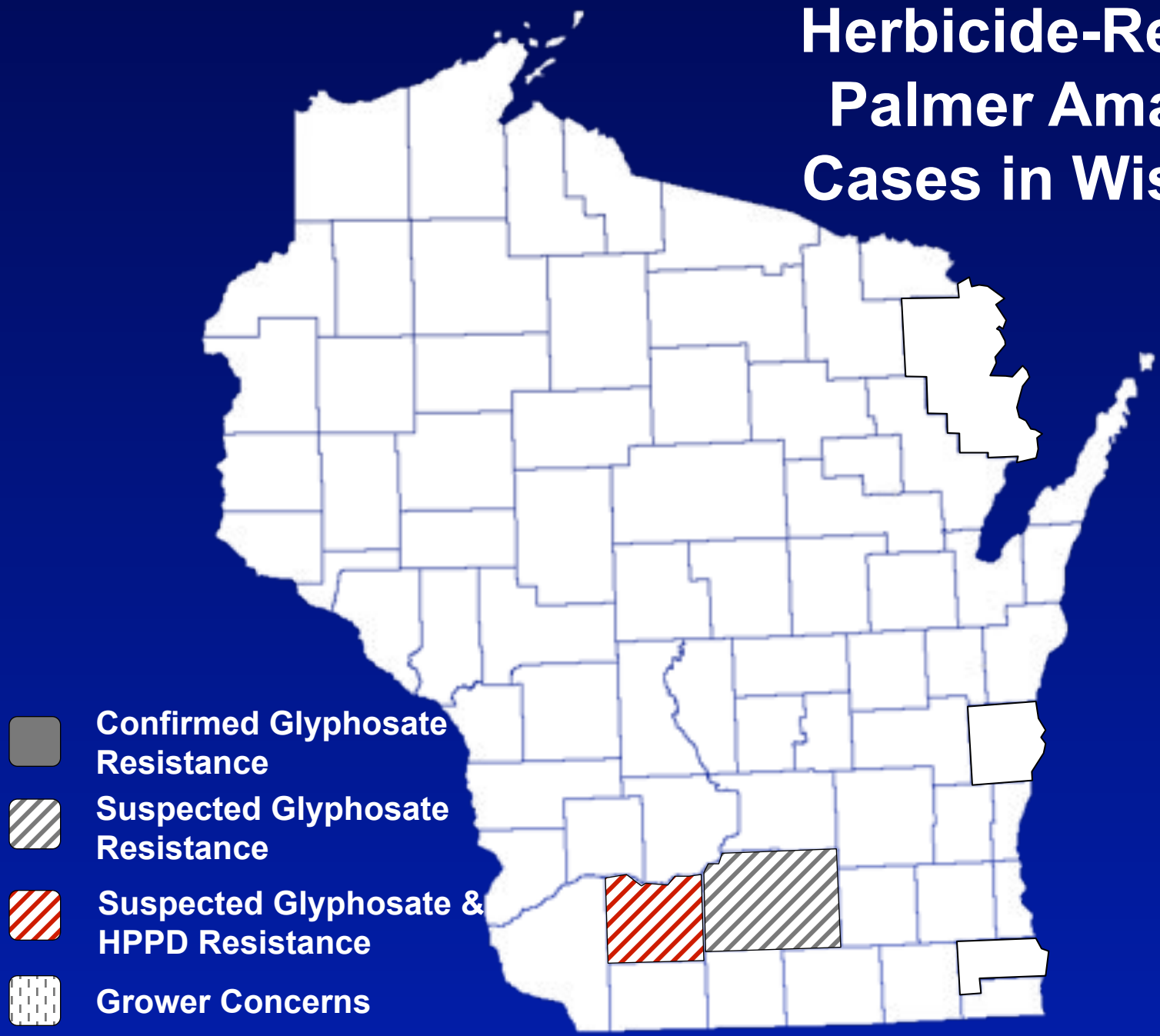


Figure 1. Comparison of ten Eau Claire County common waterhemp versus seven susceptible plants. Pictures taken at 14 days after application.

Slide source: V. Davis

Herbicide-Resistant Palmer Amaranth Cases in Wisconsin



	Common Waterhemp	Redroot Pigweed	Smooth Pigweed	Powell Amaranth	Palmer Amaranth
Seedling shape					
Stem hairs					
Leaf shapes					
Separate male and female plants	Yes	No	No	No	Yes
Seedhead shape	smooth, long, slender	prickly, short, stout	slightly prickly, long, slender	prickly, very long, thick	very prickly, very long, thick

Source: Pratt et al., Iowa State University, 1999