2014 Tulelake Onion
Weed Control Updates

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Thank You

• California Garlic and Onion Research Advisory Board
• Tulelake Grower Cooperators
• IREC Staff and Interns
• Sensient Technologies and Olam International
• Chemical Companies
2014 Weed Control Study

Study Objectives:
• Evaluate weed control and crop safety for Prowl H₂O applied immediately after planting, at 75% radical development, and at the loop stage on multiple Tulelake soil types
• Determine if the 24c delayed preemergence Prowl H₂O label in OR and WA has a fit for Northern California growers
Prowl H20

- Water-based micro-encapsulated formulation of pendimethalin
- Generic products are now available
- Seedling Growth Inhibitor
- Controls several annual grass weeds
- Controls or suppresses several broadleaves including pigweed, henbit, kochia, lambsquarter, and purslane
Application at Planting
Application at 75% radical emergence
Application at Loop
Did Prowl Reduce Onion Stands or Reduce Early Season Onion Vigor?
Weed Control Results

• All trials at IREC included a postemergence weed control program applied over the entire trial area
  – GoalTender (3-4 fl. oz/A) at 1.5 leaf stage
  – Goal 2XL (4 fl. oz/A) + Buctril (8 fl. oz/A) at 2.5 leaf stage

• All trials in grower fields included the grower’s normal postemergence weed control program
2013 Trial at IREC
Silty Clay Loam Soil

- Prowl H20 1.5 pt/A at planting & loop stage
- Dacthal 2.5 pt/A at planting + Prowl H20 1.5 pt/A at loop stage
- Dacthal 8 pt/A at planting
- Prowl H20 1.5 pt/A at loop stage
- Dacthal 2.5 pt/A at planting
- No Preemergence herbicide

weeds per 10 ft²
2012 Trial on Sandy Loam Soil
Sandy Loam Soil

- lambsquarter
- pigweed
- nightshade

Dacthal 5 pt/A at planting (5 pt/A)

Dacthal 2.5 pt/A at planting + Prowl H20
1.5 pt/A at loop

Prowl H20 1.5 pt/A at loop stage

No Preemergence herbicide

weeds per 10 ft²

0 5 10 15 20 25 30
2014 Weed Control Results

Sites in four commercial fields
Sandy Loam Field 1

- Planted on May 1\textsuperscript{st}
- At planting treatments applied on May 2\textsuperscript{nd} (1\textsuperscript{st} irrigation occurred shortly after planting)
- 75\% radical emergence treatments applied on May 12\textsuperscript{th} (10 days after 1\textsuperscript{st} irrigation)
- Grower applied glyphosate on May 14\textsuperscript{th}
- Loop treatments applied on May 19\textsuperscript{th} (17 days after planting)
4-5 leaf stage

Weed Density at Late Planted Sandy loam Site in 2014

- Dacthal at 2.5 pt/A immediately after planting
- Dacthal at 2.5 pt/A at 75% radical development
- Untreated (normal grower practice)
- Prowl H20 1.0 pint/A + Dacthal at 2.5 pt/A immediately after planting
- Prowl H20 1.0 pint/A immediately after planting
- Prowl H20 2.0 pint/A immediately after planting
- Prowl H20 1.0 pint/A at 75% radical development
- Prowl H20 1.0 pint/A + Dacthal at 2.5 pt/A at loop stage
- Prowl H20 1.0 pint/A at loop stage
- Prowl H20 1.0 pint/A at 75% radical development
- Prowl H20 2.0 pint/A at loop stage
- Prowl H20 2.0 pint/A at 75% radical development

Roundup applied immediately before emergence
Prowl H₂O 1.0 pt/A + Dacthal 2.5 pt/A at 75% radical emergence

Dacthal 2.5 pt/A at planting
Result Summary for Site 1

• All Prowl H20 and Dacthal treatments improved control of lambsquarters

• Prowl H20 helped with nightshade control when applied at 75% radical emergence or loop stage (Goal & Buctril were the treatments that actually killed the nightshade)

• Prowl H20 and Dacthal treatments at planting delayed nightshade emergence reducing the # of emerged weeds before the glyphosate application
Sandy Loam Field 2

• Planted on April 11\textsuperscript{th}
• At planting treatments applied on April 11\textsuperscript{th} (1\textsuperscript{st} irrigation occurred shortly after planting)
• 75\% radical emergence treatments applied on April 18\textsuperscript{th} (7 days after 1\textsuperscript{st} irrigation)
• Grower did NOT apply glyphosate
• Loop treatments applied on April 30\textsuperscript{th} (19 days after planting)
Roundup was NOT applied immediately before emergence.

Weed Density at Early Planted Sandy loam Site in 2014

4-5 leaf stage

- Untreated (normal grower practice)
- Prowl H20 1.0 pint/A + Dacthal at 2.5 pt/A immediately after planting
- Dacthal at 2.5 pt/A immediately after planting
- Prowl H20 1.0 pint/A at 75% radical development
- Prowl H20 1.0 pint/A at loop stage
- Prowl H20 1.0 pint/A immediately after planting
- Prowl H20 1.0 pint/A + Dacthal at 2.5 pt/A at loop stage
- Prowl H20 2.0 pint/A at 75% radical development
- Prowl H20 2.0 pint/A immediately after planting
- Prowl H20 1.0 pint/A + Dacthal at 2.5 pt/A at 75% radical development
- Dacthal at 2.5 pt/A at 75% radical development
- Prowl H20 2.0 pint/A at loop stage

Legend:
- hairy nightshade
- lambsquarter
- pigweed
- mallow
- miscellaneous
Large difference between the untreated and all Prowl H2O treatments
Roundup was NOT applied immediately before emergence.
Result Summary for Site 2

• All treatments improved control of lambsquarter
• Weed control differences between application timings were not as evident as at Site 1
• There was no statistical difference in nightshade control between all Prowl H₂O treatments
• Dacthal and Prowl H₂O treatments at 75% radical emergence and Prowl H₂O at 2 pt/A at all application times resulted in the best control of common mallow and pigweed
High Organic Matter
Silty Clay Loam Field 3

• Planted on April 14th
• At planting treatments applied on April 15th (1\textsuperscript{st} irrigation occurred shortly after planting)
• 75\% radical emergence treatments applied on April 29th (14 days after 1\textsuperscript{st} irrigation)
• Grower applied glyphosate on May 2\textsuperscript{nd}
• Loop treatments applied on May 5\textsuperscript{th} (22 days after planting)
Weed Density at Copic Bay Silty Clay Loam Site in 2014

4-5 leaf stage

- Dacthal at 2.5 pt/A immediately after planting
- Prowl H2O 1.5 pt/A immediately after planting
- Prowl H2O 3.0 pt/A at loop stage
- Prowl H2O 1.5 pt/A + Dacthal at 2.5 pt/A at loop stage
- Dacthal at 2.5 pt/A at 75% radical development
- Prowl H2O 1.5 pt/A at 75% radical development
- Untreated (normal grower practice)
- Prowl H2O 1.5 pt/A at loop stage
- Prowl H2O 1.5 pt/A + Dacthal at 2.5 pt/A immediately after planting
- Prowl H2O 3.0 pt/A at 75% radical development
- Prowl H2O 3.0 pt/A immediately after planting
- Prowl H2O 1.5 pt/A + Dacthal at 2.5 pt/A at 75% radical development

No statistical difference between treatments - A lot of variability in weed pressure between plots

Roundup was applied shortly before onion emergence
Result Summary for Site 3

• No statistical difference between treatments
• Were the rates of Prowl H₂O too low for soil type?
• Some treatments applied immediately after planting appeared to delay emergence of pigweed preventing control with glyphosate
  – Treatments at planting thinned the pigweed population very early and those pigweed plants that survived were larger and difficult to control with Goal
• The grower’s Goal program failed to kill pigweed
Silty Loam Field 4

- Planted on April 15th
- At planting treatments applied on April 16th (1st irrigation occurred shortly after planting)
- 75% radical emergence treatments applied on April 28th (12 days after 1st irrigation)
- Grower applied glyphosate on May 1st
- Loop treatments applied on May 6th (21 days after planting)
Roundup was applied shortly before onion emergence.

Roundup timing was perfect and killed most weeds!
No statistical difference in yield.
Weed Study Summary

• Prowl H20 was safe on onions at all sites

• Application at 75% radical emergence seemed to be the best universal application timing but more research is needed

• Prowl H20 provided variable control of lambsquarter, pigweed, and nightshade depending on the soil type and grower’s herbicide program

• Higher rates may be needed on silty clay loam soils
Questions

Reports available at:
irec.ucanr.edu
2014 White Rot Study

• DADS and Garlic Juice Treatments were applied Spring 2013
• Wheat was grown Summer 2013
• Onions were planted Spring 2014
  – Fungicides were applied “in-furrow” at planting in 2014
• No Fungicides were applied after planting
No visual differences until late August
Big Differences started to appear in Late August and September
Figure 1. Onion Leaf Dieback on 9/10/14

- DADS 1 gal/A
- Garlic Juice shelf-stable formulation, 0.5 gal/A
- Garlic Juice shelf-stable formulation, 1 gal/A
- Garlic Juice raw formulation, 0.5 gal/A
- Garlic Juice raw formulation, 1 gal/A
- No germination stimulant

TebuStar 20.5 fl. oz/A + Fontellis 24 fl. oz/A in-furrow at planting

TebuStar 20.5 fl. oz/A in-furrow at planting

Untreated (no fungicide at planting)

% of plants showing leaf dieback symptoms
Onion Leaf Dieback on September 10th, 2014 Averaged Across Germination Stimulant Treatments Applied 2013

- TebuStar 20.5 fl. oz/A + Fontellis 24 fl. oz/A in-furrow at planting
- TebuStar 20.5 fl. oz/A in-furrow at planting
- Untreated (no fungicide at planting)

% of plants showing leaf dieback symptoms
Figure 2. Disease-Free (Clean) Onion Yield at IREC in 2014

- **DADS 1 gal/A**
- **Garlic Juice shelf-stable formulation, 0.5 gal/A**
- **Garlic Juice shelf-stable formulation, 1 gal/A**
- **Garlic Juice raw formulation, 0.5 gal/A**
- **Garlic Juice raw formulation, 1 gal/A**
- **No germination stimulant**

**TebuStar 20.5 fl. oz/A + Fontellis 24 fl. oz/A in-furrow at planting**

**TebuStar 20.5 fl. oz/A in-furrow at planting**

**Untreated (no fungicide at planting)**

**Clean Yield (tons/acre)**

0 5 10 15 20 25 30
Figure 3. Influence of DADS Applied in 2013 and Fungicides Applied Spring 2014 on Onion Yield at IREC

- **clean (disease-free) yield**
- **yield with disease symptoms**

**TebuStar 41 fl. oz/A in-furrow at planting**

**DADS 1 gal/A & TebuStar 20.5 fl. oz/A + Fontellis 24 fl. oz/A in-furrow at planting**

**DADS 1 gal/A & TebuStar 20.5 fl. oz/A in-furrow at planting**

**TebuStar 20.5 fl. oz/A + Fontellis 24 fl. oz/A in-furrow at planting**

**DADS 1 gal/A & TebuStar 20.5 fl. oz/A in-furrow at planting**

**TebuStar 20.5 fl. oz/A in-furrow at planting**

**DADS 1 gal/A (no fungicide at planting)**

**Untreated (no fungicide at planting)**

**Bulb Yield (tons/acre)**
Untreated
Diseased Bulbs
TebuStar 21 fl.oz/A
DADS + Tebustar 21 fl. oz/A
Demand DADS

• How many acres in California are a candidate for DADS treatment?
• How many acres would growers be willing shank-apply DADS if they were confident the treatment would allow production of a profitable crop?
• What is an acceptable treatment cost per acre?