Management of Maggots and Weed Control in Processing Onions

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In 2011, a maggot control study was established at IREC in Tulelake with funding support from the California Garlic and Onion Research Board.

Study objectives were to compare insecticides and insecticide application methods (in-furrow at planting versus seed treatment) to the current in-furrow standard (Lorsban).
Seed treatment

- Sepresto, Entrust, and Cruiser applied via encrustment by Alan Taylor at Cornell University
- FarMore applied as a pellet coating (BB size)

In-furrow treatments

- Teejet AI nozzles mounted on the onion planter applied a 4-inch band directly over the seed after seed placement but before furrow closure
Maggot Fly Counts in 2011
Both Seed Corn Maggot and Onion Maggot were ID
Larvae often found feeding on hypocotyl and roots up to 2 leaf stage
Influence of Insecticides Applied for Maggot Control on Onion Stand Density

- Entrust (spinosad) seed trt
- Sepresto (clothianidin + imidacloprid) seed trt
- Lorsban 4E (chlorpyrifos) in-furrow
- FarMoreEl500 (thiamethoxam + spinosad) seed trt
- Lorsban 15-G (chlorpyrifos) in-furrow
- Cruiser (thiamethoxam) seed trt
- HGY86 (cyazypyr) in-furrow
- Entrust (spinosad) 6 oz/A in-furrow
- Thiram-treated Control
- Coragen (rynaxypyr) in-furrow
- Untreated Control seed-
- Entrust (spinosad) 2 oz/A in-furrow
- Admire Pro (imidacloprid) + Entrust (spinosad) in-furrow
- Admire Pro (imidacloprid) 7 fl oz/A in-furrow
- Admire Pro (imidacloprid) 14 fl oz/A in-furrow

Error bars = 95% Confidence Interval

Plants per plot
Sepresto, Entrust, and FarMore FI500 applied as a seed treatment provided similar or superior protection from maggot damage compared to the current standard Lorsban.

Applying neonicotinoid and spinosyn insecticides as a seed treatment was far more effective than applying them in-furrow at planting.
Study objective was to evaluate the efficacy and crop safety of preemergence herbicide tank-mix combinations applied at planting and the loop onion growth stage.

2011 treatments were broadcast applied on small plots in order to evaluate a larger number of preemergence herbicide tank-mix combinations than we were capable of evaluating in chemigation trials.

- Most preemergence treatments also included GoalTender applied at the 1.5 leaf stage followed by Goal + Buctril applied at the 2.5 leaf stage.

Treatments were applied at two sites to compare herbicide efficacy and crop safety on different soil types.
Unfortunately, No.

CA onion producers are still currently relying on a handful of herbicides for weed control in onions.
CA DPR Herbicide Use Report for Dry Processing Onions

- **OXYFLUORFEN**
- **BROMOXYNIL**
- **PENDIMETHALIN**
- **CLETHODIM**
- **DIMETHENAMID-P**
- **GLYPHOSATE**
- **FLUAZIFOP-P-BUTYL**
- **DCPA**
- **ETHOFUMESATE**
- **BENSULIDE**
- **SETHOXYDIM**
- **CARFENTRAZONE-ETHYL**
- **FLUMOXAZIN**

![Bar chart showing herbicide use in acres for years 2008, 2009, and 2010.](chart.png)
Influence of Preemergence Herbicides on Total Weed Density at IREC in 2011
(weeds included kochia, pigweed, lambsquarters, & clover)

- Prowl at loop + Goal + Buctril + Outlook at 14 fl. oz/A at 2-leaf stage
- Dacthal 2.5 pt/A at planting & Prowl + Nortron at loop
- Prowl H20 1.5 pt/A at loop
- Dacthal 2.5 pt/A + Nortron 16 fl. oz/A at planting
- Nortron 16 fl. oz/A at planting
- Dacthal 5 pt/A at planting
- Goal + Buctril Only (no-pre)

Error bars = 95% confidence interval
Weed Density in untreated plots was 175 weeds per plot
Untreated at 6-leaf stage
Goal + Buctril at 6-leaf stage
Dacthal + Prowl H20 + Nortron
Summer Weed Escapes in Goal + Buctril Treatment
Influence of Preemergence Herbicides on Onion Yield at IREC in 2011

(onion yields across treatments were 40% below normal due to stand loss and late planting date)

- Prowl at loop + Goal + Buctril + Outlook at 14 fl. oz/A at 2-leaf
- Dacthal 2.5 pt/A at planting & Prowl + Nortron at loop
- Prowl H20 1.5 pt/A at loop
- Dacthal 2.5 pt/A + Nortron 16 fl. oz/A at planting
- Nortron 16 fl. oz/A at planting
- Dacthal 5 pt/A at planting
- Goal + Buctril Only (no-pre)
- Hand-weeded Control

error bars = 95% confidence interval

Tons per Acre
Onion Yields at Grower Site in 2011 (Sandy Loam Soil)

- Dacthal 2.5 pt/A at planting & Nortron + Prowl at loop + Grower Program
- Dacthal 2.5 pt/A + Nortron 16 fl. oz/A at planting + Grower Program
- Nortron 16 fl. oz/A at planting + Grower Program
- Dacthal 5 pt/A at planting + Grower Program
- Grower Program (Prowl and Repeat Goal Applications)

Error bars = 95% confidence interval

Yield (Tons per Acre)
Preemergence herbicide trts that increased weed control that did not reduce yield at both sites included:

• Dacthal at 2.5 and 5.0 pt/A applied at planting
• Dacthal at 2.5 pt/A + Nortron at 16 fl. oz/A applied at planting
• Prowl H20 at 1.5 pt/A applied at the loop stage
Treatments that caused a significant reduction in onion stand and onion yield included:

- Dacthal at 10 pt/A applied at planting
- Nortron at 32 fl. oz/A + Prowl H20 at 1.5 pt/A applied at loop stage
- Goal + Buctril + Outlook applied at the 2.5 leaf stage (if you want to use Outlook keep Buctril out of the mix)
Thank You

- IREC Staff
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- Sensient and Olam International
- DuPont, Dow AgroScience, Syngenta, Bayer CropScience, Amvac, BASF
- McKoen Farms, Macy’s Flying Service, and Basin Fertilizer
- Alan Taylor, Cornell University