Management of Maggots in Processing Onions

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Background

- Early season stand loss from maggot is a regular problem for Tulelake onion growers
- In recent years growers reported significant stand loss in Lorsban-treated fields
- The Tulelake NWR is prohibiting the use of chlorpyrifos on lease lands due to environmental concerns

Maggot Control in Processing Onions

- In 2011 and 2012, a maggot control study was conducted 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)

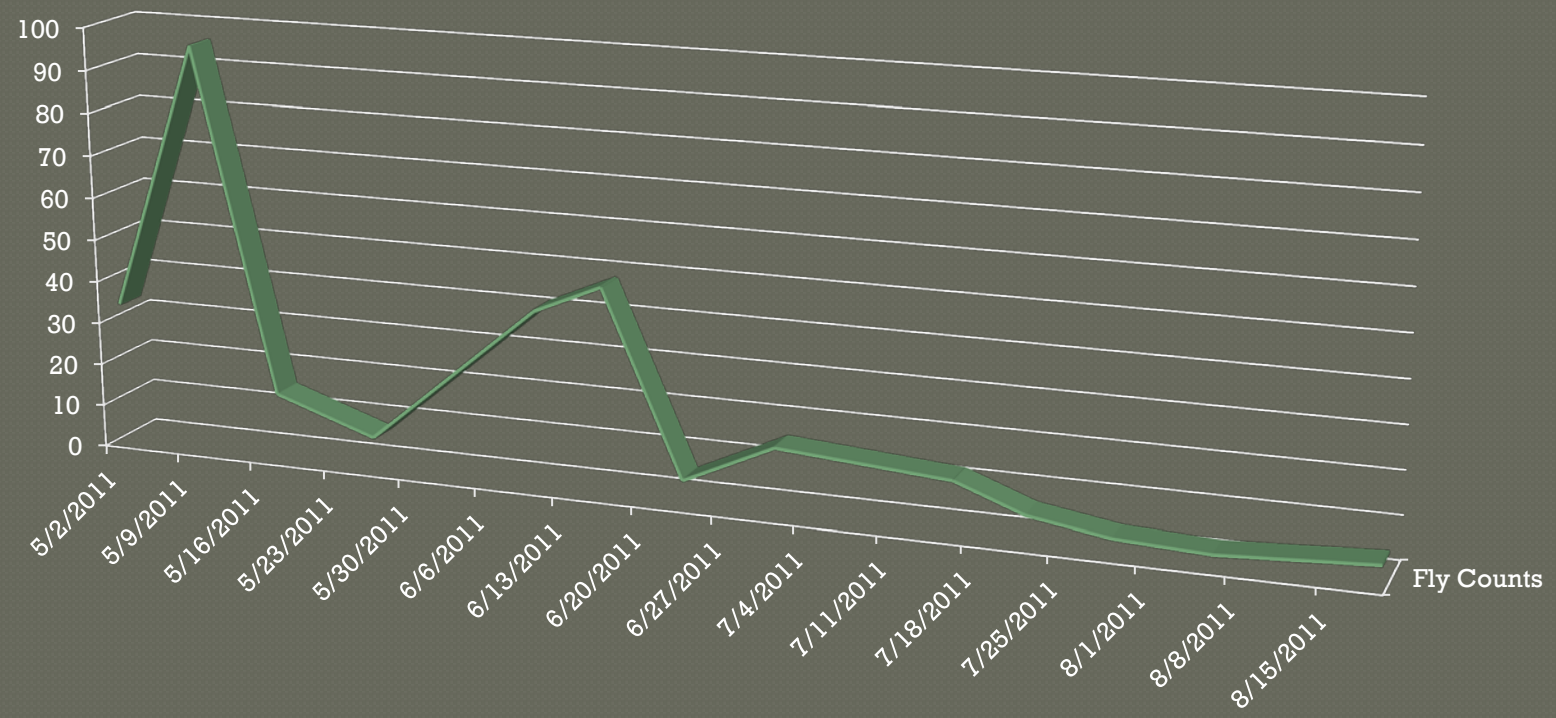
Insecticide Application Methods

- 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
- Rototill incorporated before planting
  - Broadcast applied over the top of the bed and then immediately incorporated in the top 4 inches of soil with a 2-row tiller/bed shaper


Our technique for assuring a high maggot population

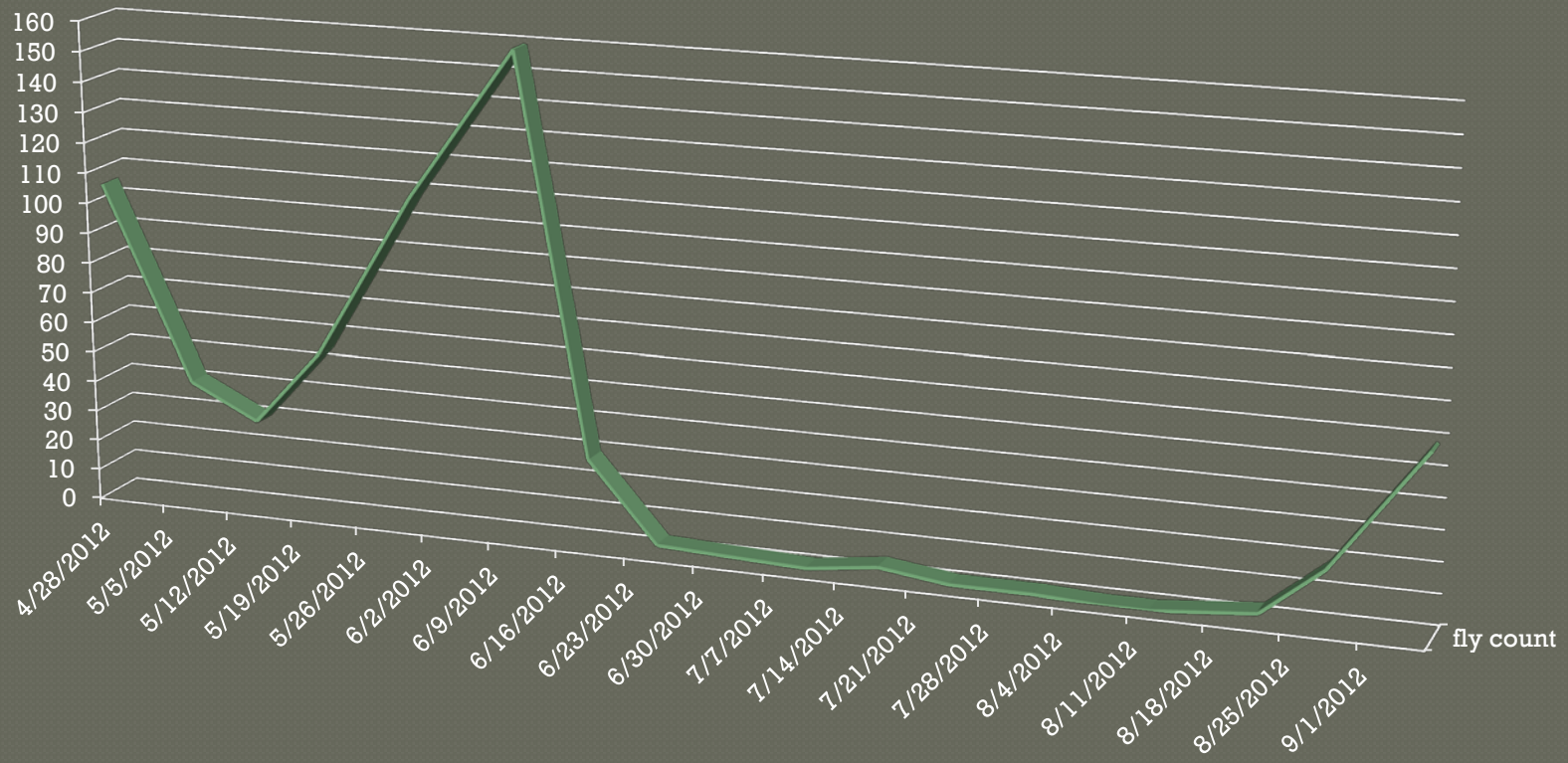
Total Maggot Fly Counts in 2011

Both Seed Corn Maggot and Onion Maggot were captured



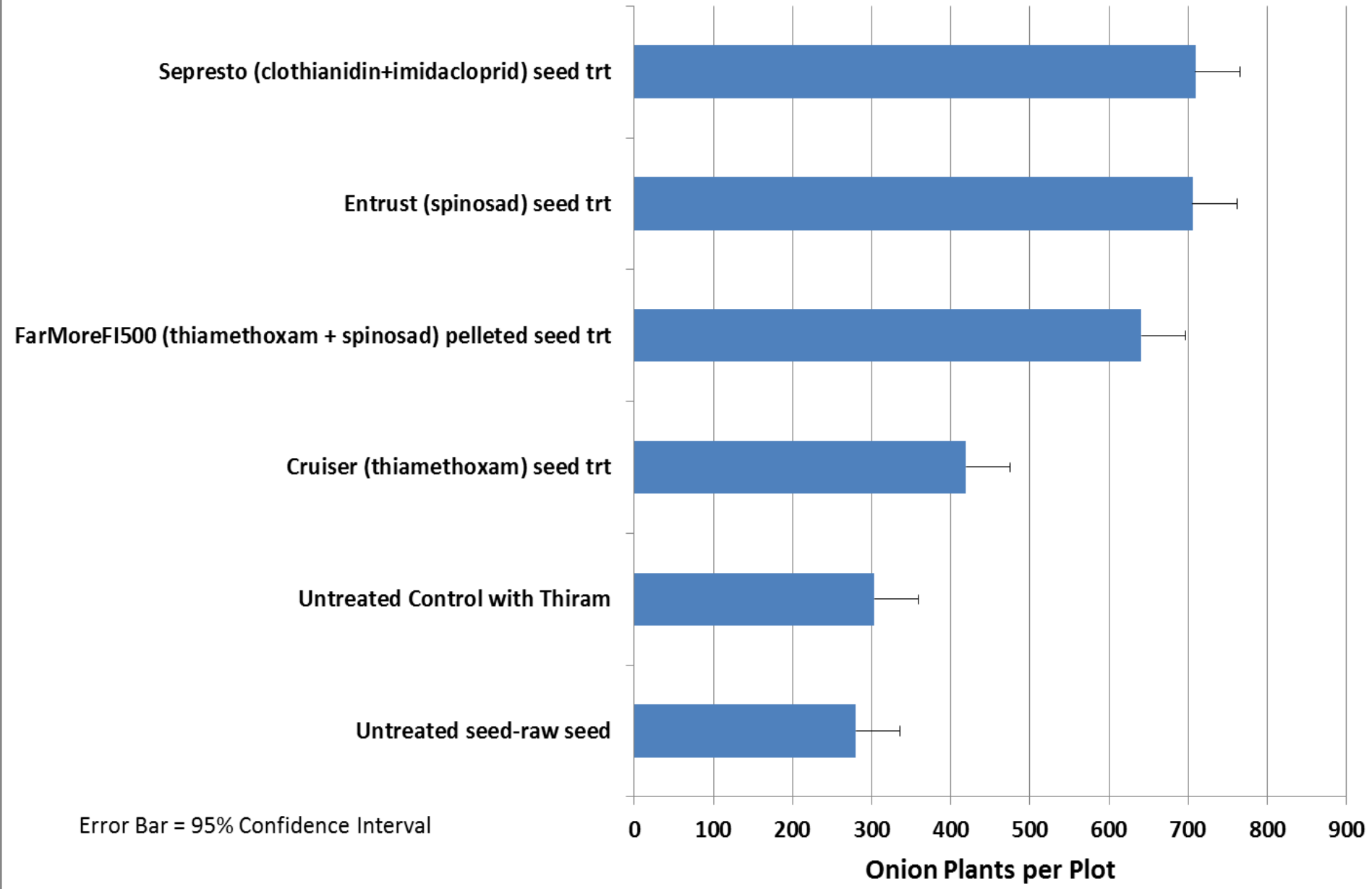
Total Onion and Seed Corn Maggot Fly Counts in 2012

6% to 30% seed corn maggot

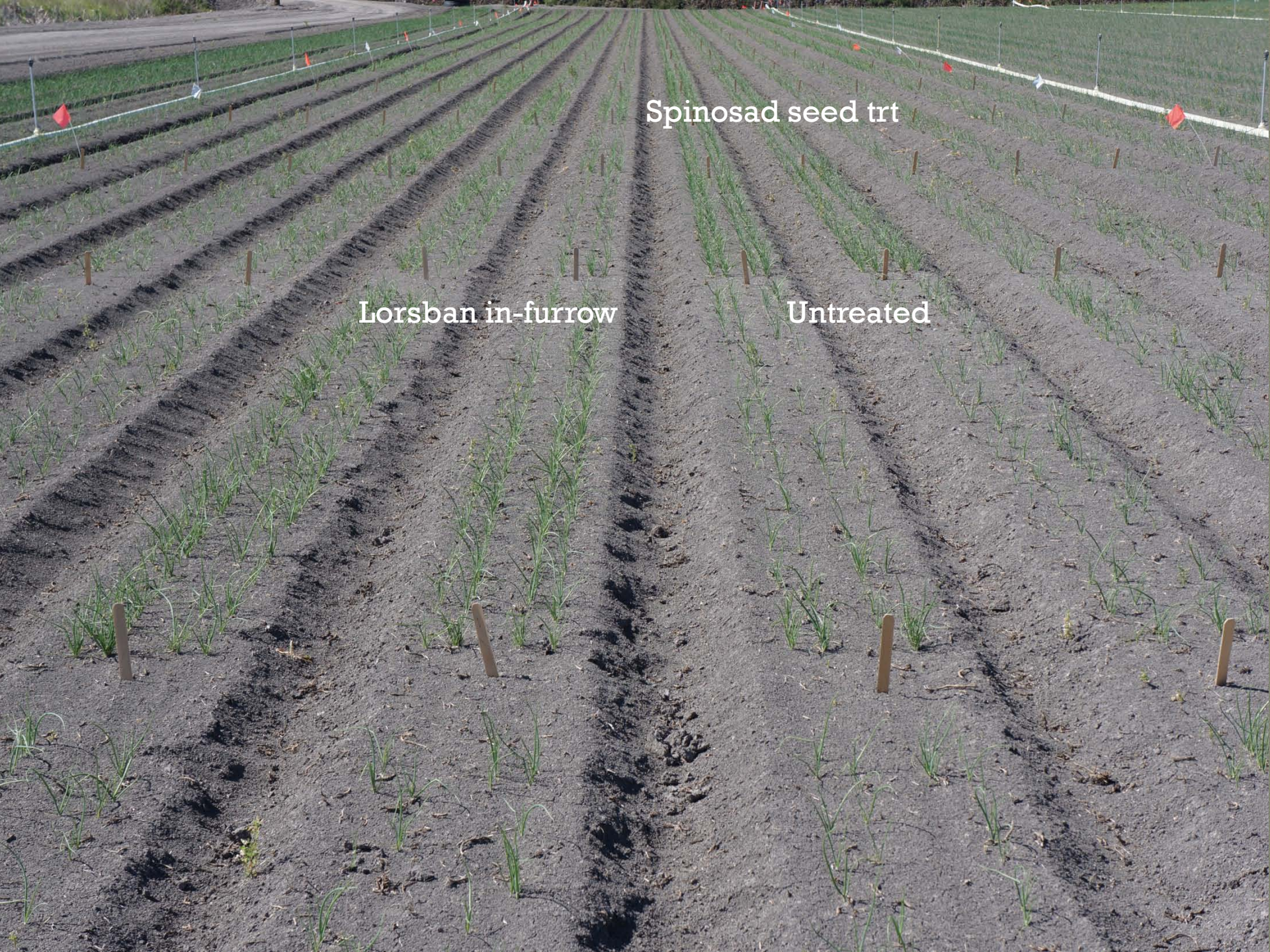


Seed Treatment

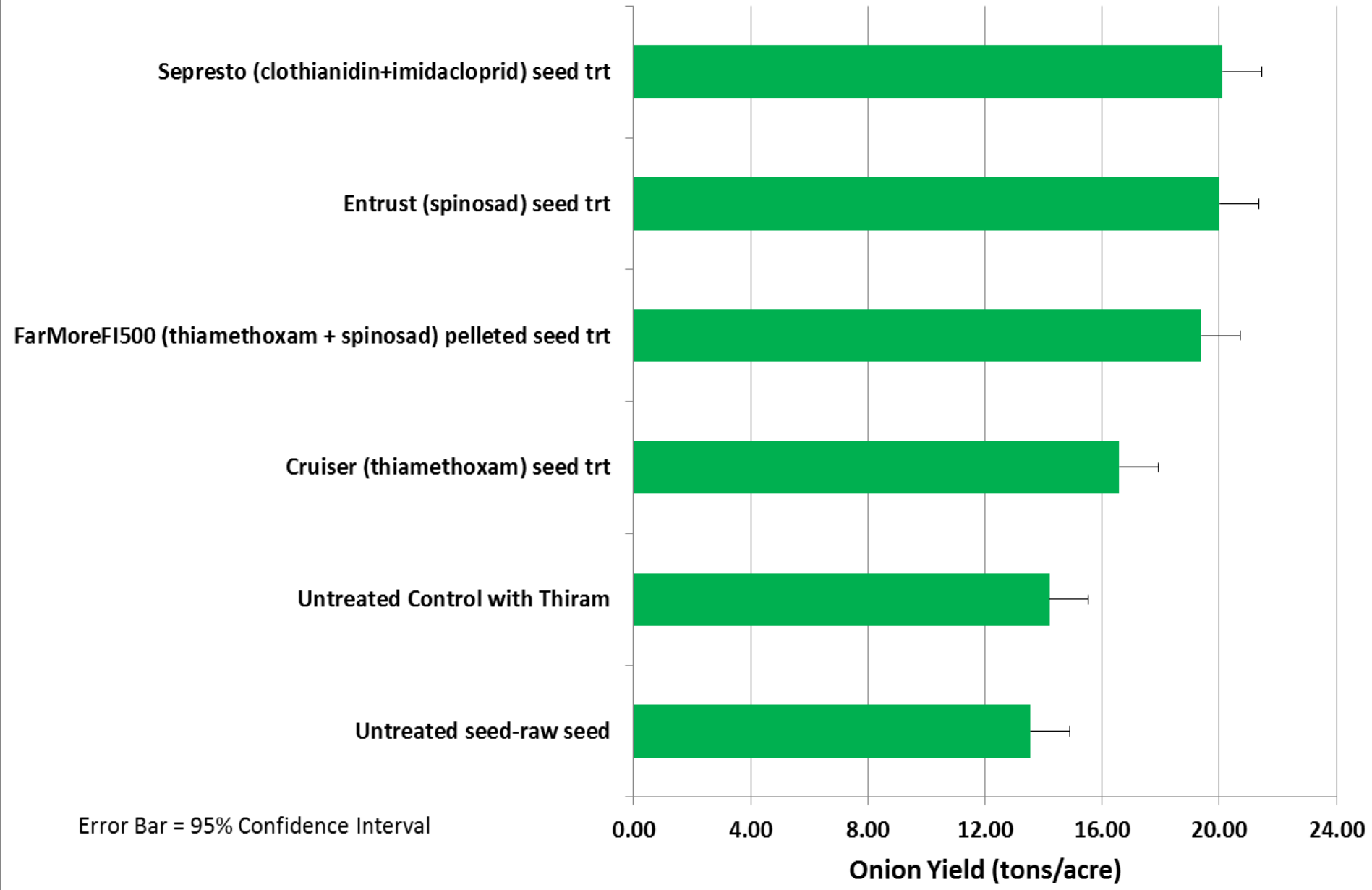
Influence of Insecticide Seed Treatments on Onion Stand Density at the 3-leaf Stage Averaged Across 2011 and 2012 Trials at IREC



Error Bar = 95% Confidence Interval


Spinosad seed trt
Lorsban in-furrow
Untreated

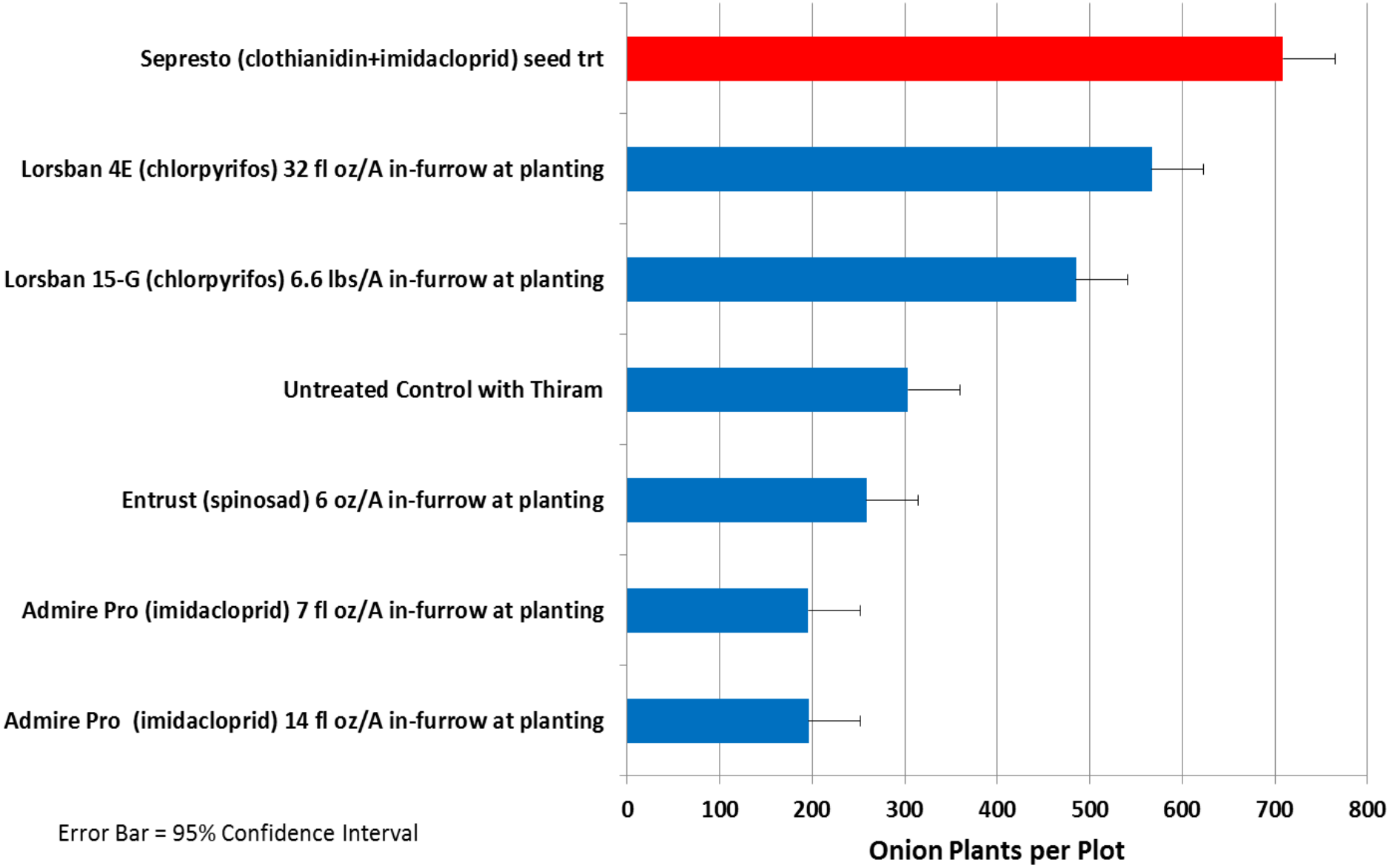
Influence of Insecticide Seed Treatments on Onion Yield Averaged Across 2011 and 2012 Trials at IREC



In-furrow at Planting

Influence of Insecticides Applied In-furrow at Planting on Onion Stand at the 3-Leaf Stage Averaged Across 2011 and 2012 Trials at IREC

(Sepresto Seed Treatment included for comparison)



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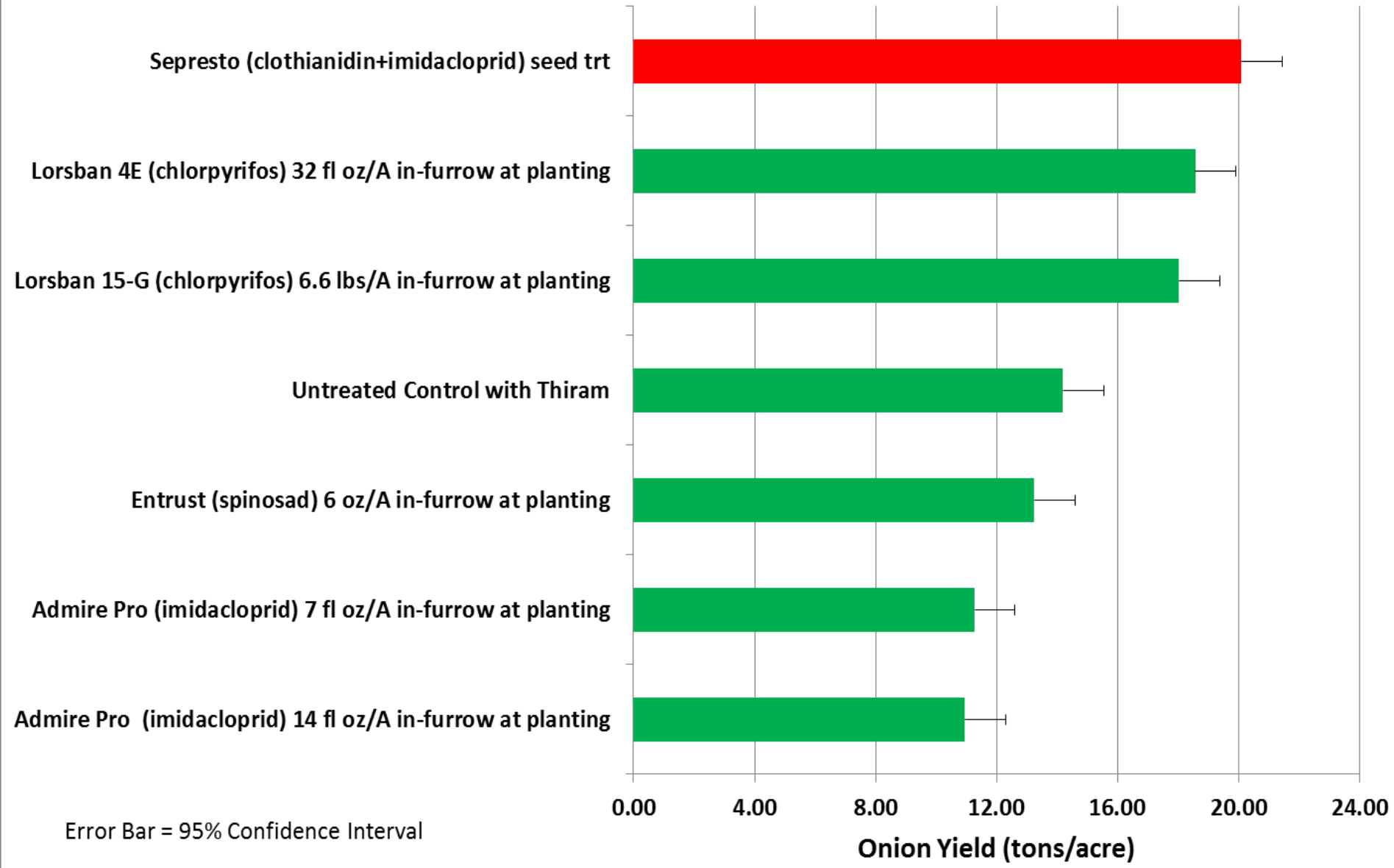

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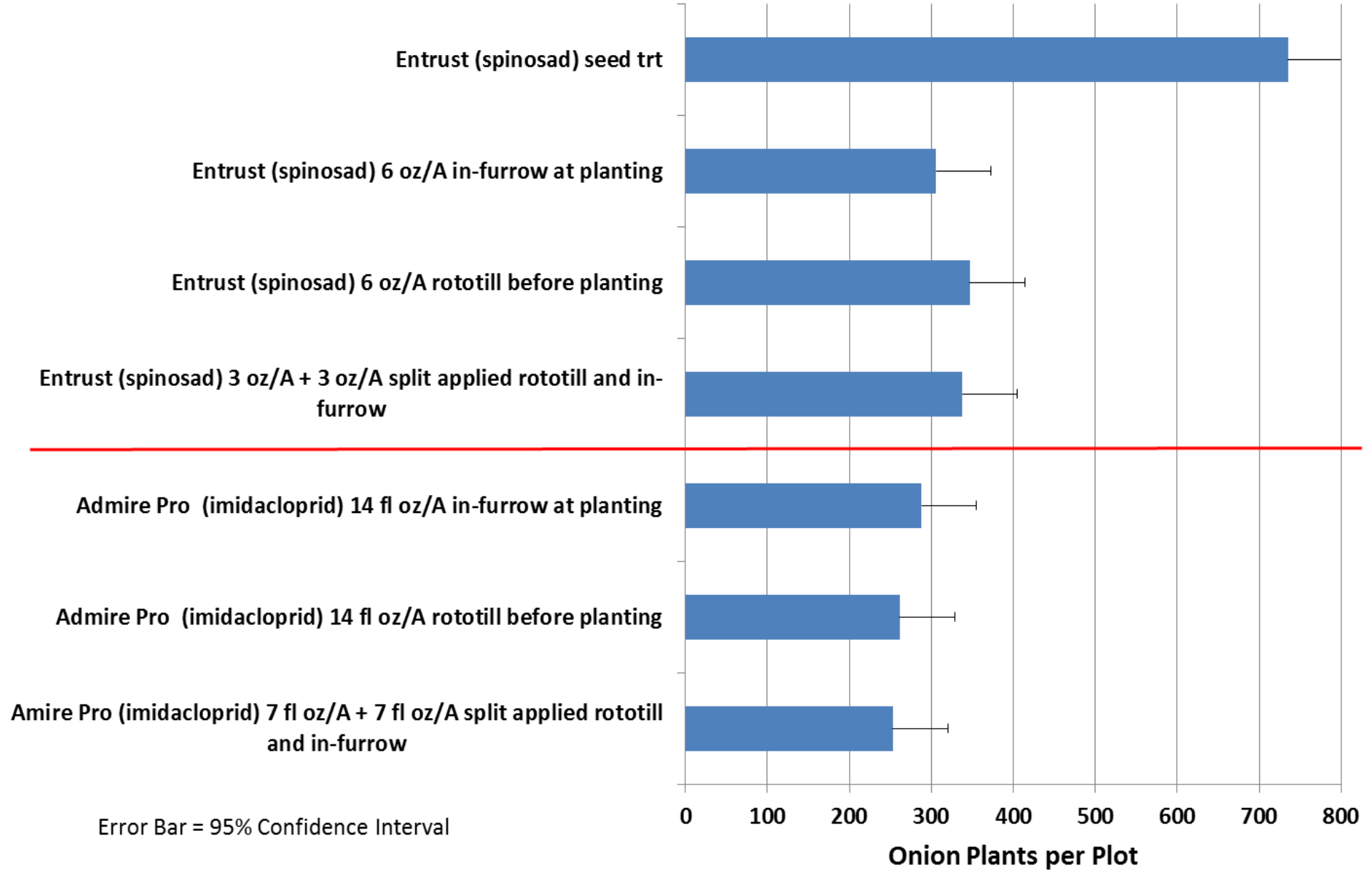
Rototill-incorporated Before Planting

Influence of Spinosad and Imidacloprid Application Method on Onion Stand at the 3-leaf Stage in 2012 at IREC



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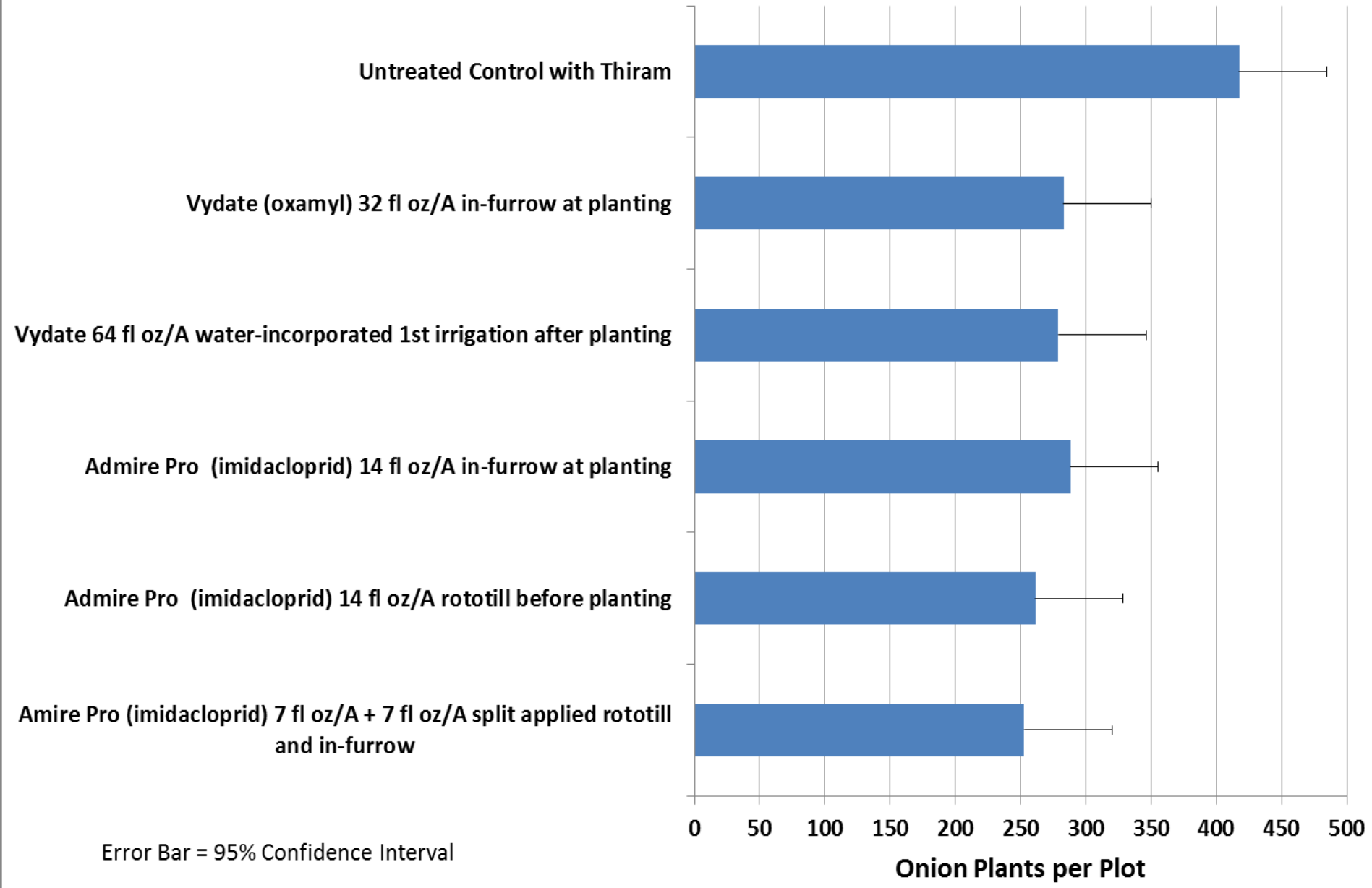
Oxamyl and Imidacloprid

Influence of Oxamyl and Imidacloprid on Onion Stand at the 3-leaf Stage in 2012 at IREC



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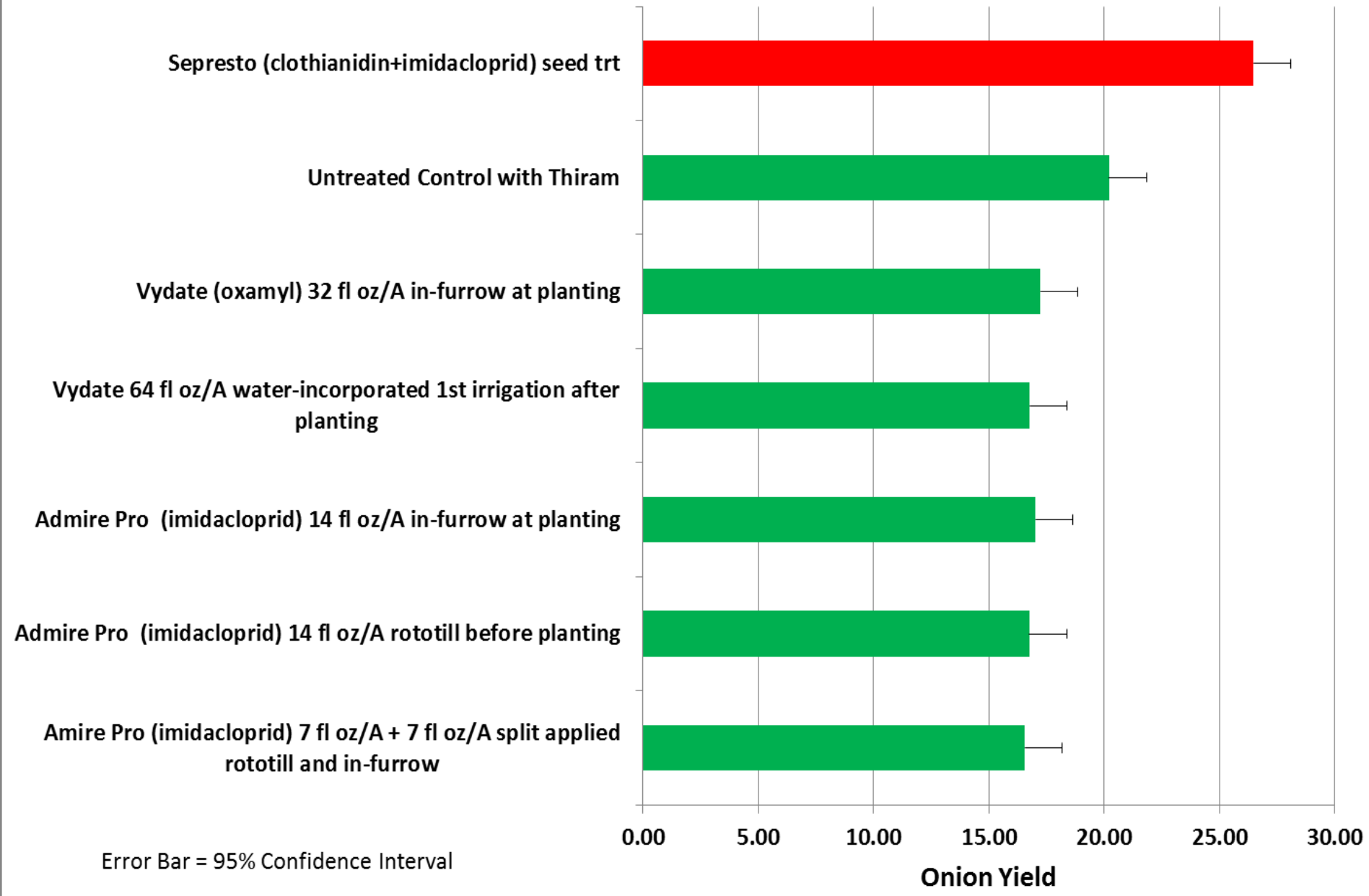
Influence of Oxamyl and Imidacloprid on Onion Yield in 2012 at IREC

Sepresto Seed Treatment included for comparison



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Maggot Trial Summary

- Products with clothianidin (Sepresto) and spinosad (Entrust, Regard, or FarMore) applied as a seed treatment provided superior protection from maggot damage compared to the current standard Lorsban
- Syngenta labeled FarMore FI-500 and OI-100 for seed treatment in CA
  - FarMore FI-500 (fludioxonil-Maxim, azoxystrobin-Dynasty, mefenoxam- Apron, **spinosad-Regard**, and thiamethoxam-Cruiser) applied as pellet form
  - OI-500 (**spinosad- Regard or Entrust**) applied as film coat or encrustment
  - Cost probably around $100 to $140 per acre depending on seeding rate

2012 Weed Control Study

- Improve control of problem weeds (kochia, common lambsquarter, & pigweed)
- Large field-size studies using grower application equipment (solid-set sprinkler chemigation)
- Investigate herbicide tank-mixes and sequential herbicide application strategies


2012 Trial


2012 Trial

Kochia Control Results

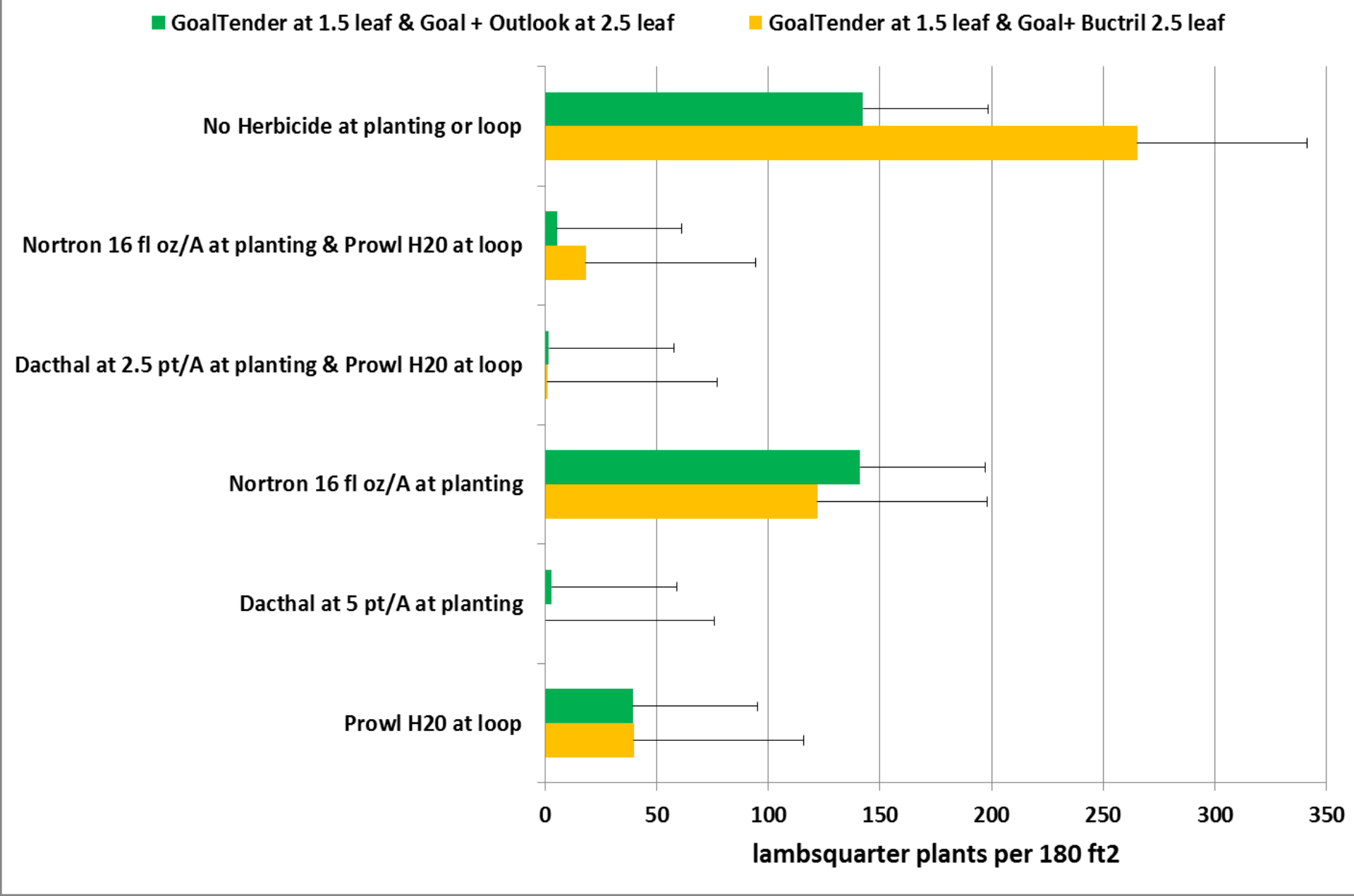
- Dacthal applied at post-plant and Prowl H20 applied at loop provided the best pre-emergence control
  - Preemergence herbicides alone did not provide acceptable control of kochia.
- GoalTender at 1.5 leaf stage and Goal + Buctril at 2.5 leaf stage was the best postemergence program!
- Starane (fluroxypyr) applied between 4-5 leaf stage controlled kochia up to 6 inches tall, but it's not labeled in CA

Does Starane have a fit in CA?

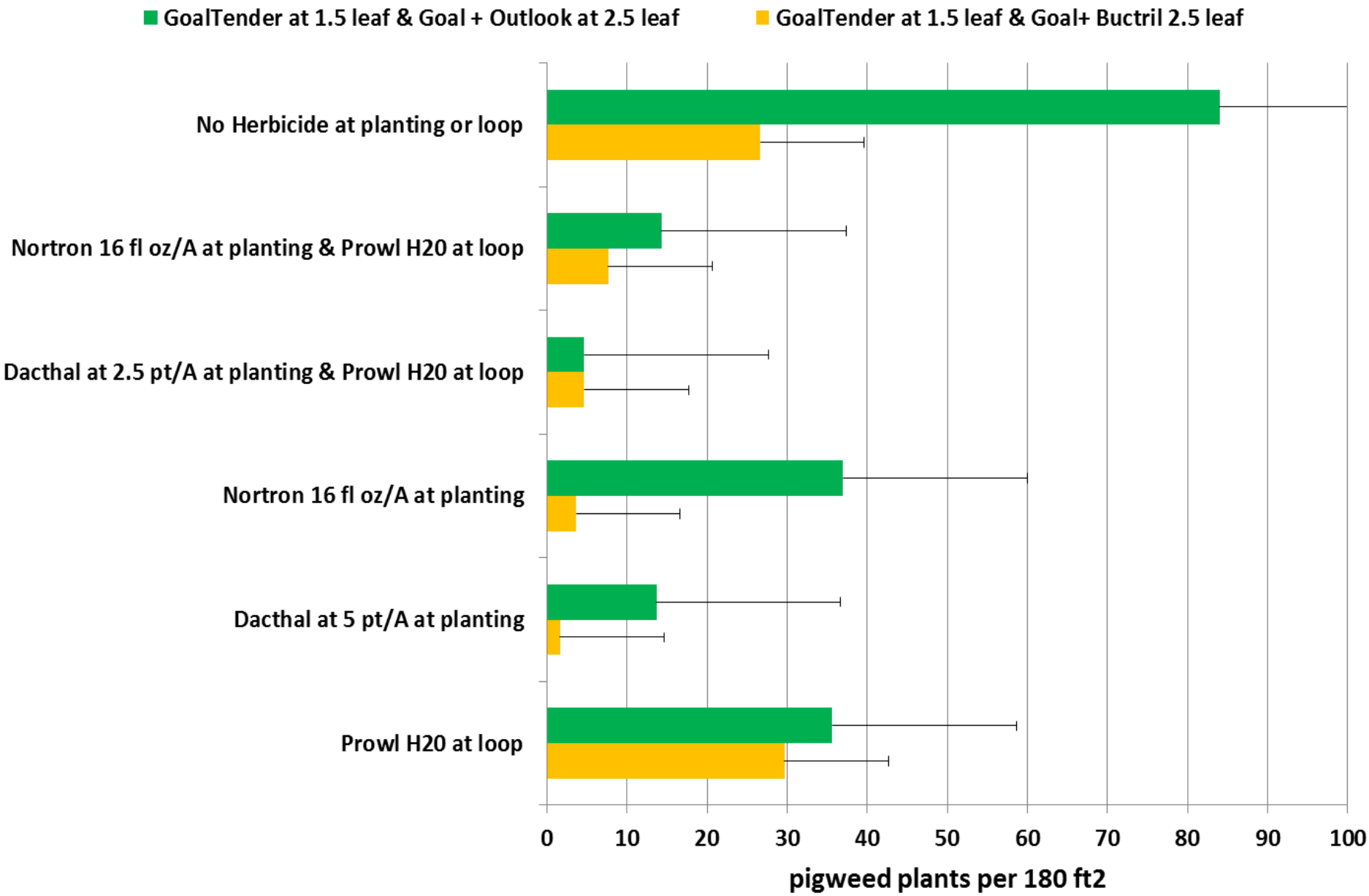
- Weeds Starane controls: kochia, clover, ragweed, potatoes, chickweed, purslane, and morningglory
- Weeds Starane suppresses: field bindweed, horseweed, and Russian thistle
- Starane caused significant crop injury (laid onions flat) but it did not reduce yields in IREC trials. Works best split-applied at high GPA.

Lambsquarter and Pigweed Control Results

Lambsquarter Density at 4-leaf stage at the Grower Site with Sandy Loam Soil in 2012



Pigweed Density at 4-leaf stage at the Grower Site with Sandy Loam Soil in 2012



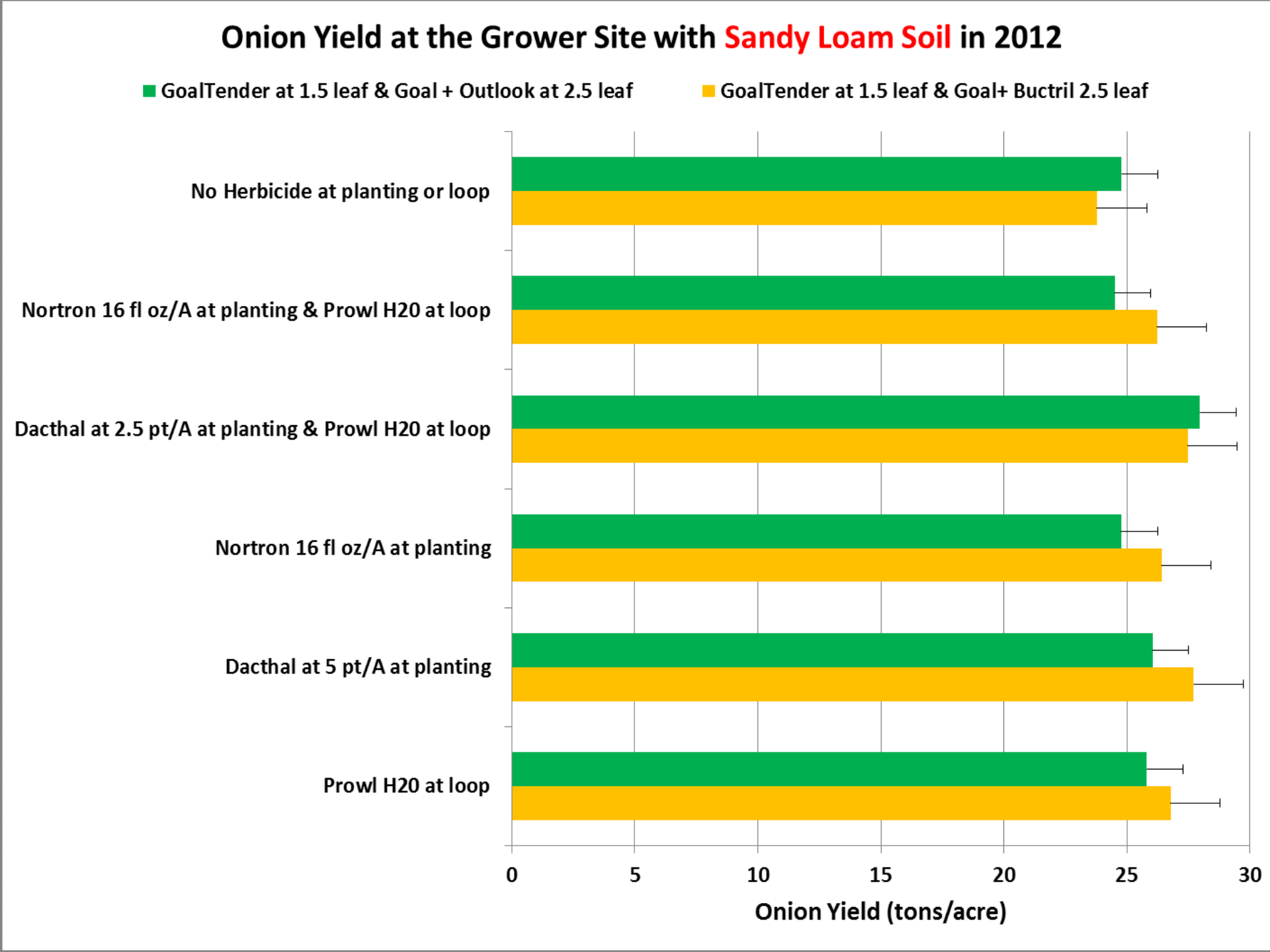

5 leaf stage


No herbicide at planting or loop

Yield Results

Yield Results

- Dacthal at 5 pts/A applied at planting and Prowl H20 at loop stage did not reduce yield in any of the trials
- Nortron caused onion injury and a slight yield reduction when applied on sandy loam soil
- Crop safety was excellent when Nortron was applied to onions on clay loam soil
- Goal + Buctril + Outlook reduced onion yield in multiple trials


Onion Yield at the Grower Site with Sandy Loam Soil in 2012
GoalTender at 1.5 leaf & Goal + Outlook at 2.5 leaf
GoalTender at 1.5 leaf & Goal+ Buctril 2.5 leaf
No Herbicide at planting or loop
Nortron 16 fl oz/A at planting & Prowl H20 at loop
Dacthal at 2.5 pt/A at planting & Prowl H20 at loop
Nortron 16 fl oz/A at planting
Dacthal at 5 pt/A at planting
Prowl H20 at loop
0
5
10
15
20
25
30
Onion Yield (tons/acre)

Summary

- Dacthal at planting or Prowl H2O applied at loop improved weed control with excellent crop safety
- Weeds that escaped Prowl H20 treatment grew slower and were more susceptible to postemergence herbicides
- Reduced Dacthal rates (below 5 pt/A) were possible when combined with Prowl H20 applied at loop
- Nortron was most effective when combined with Prowl H20 at loop

Summary

- Goal Tender at 1.5 –leaf is an important treatment to control weed seedlings and slow growth of larger weeds
- Avoid Goal applications after 4-5 leaf stage
- Make sure sprinkler coverage is uniform when chemigating herbicides!

Thank You

- IREC Staff
- California Garlic and Onion Research Advisory Board
- 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