# Research Updates
# Weed Control Evaluations on Specialty Crops:
# Spinach, Beets, Leeks, Peppers


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# Spinach Weed Control Trials

- **RoNeet is no longer being manufactured**
- **Dual Magnum was registered in California in 2008, however it has limitations:**
  - **12 month plant back restriction to lettuce**
  - **50 day preharvest interval**

# 2009 Weed Control Evaluations

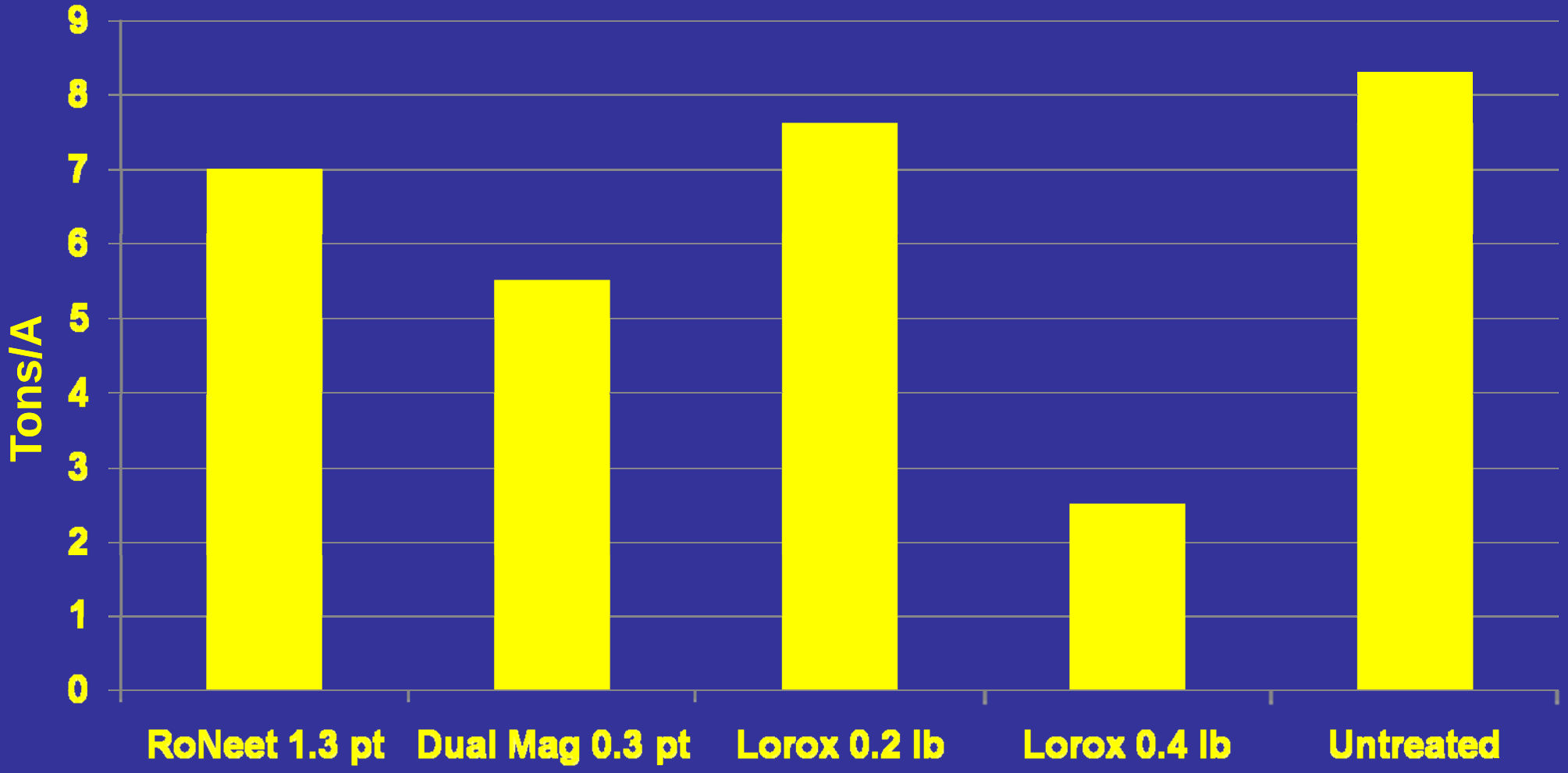
- We conducted 5 trials in 2009 focusing on light soil types evaluating the safety and efficacy of Lorox and Dual Magnum

# 2009 Spinach Evaluations

| Treatment | Material/A | Lbs a.i./A |
|---|---|---|
| RoNeet 6E | 1.25 pt | 0.93 |
| Dual Magnum 7.63 | 0.3 pt | 0.29 |
| Lorox 50 | 0.2 lb | 0.1 |
| Lorox 50 | 0.4 lb | 0.2 |
| Lorox 50 | 0.8 lb | 0.4 |
| Untreated | ---- | ---- |

# Yield of Spinach Trial No. 2

## Soil type = Chualar Loam



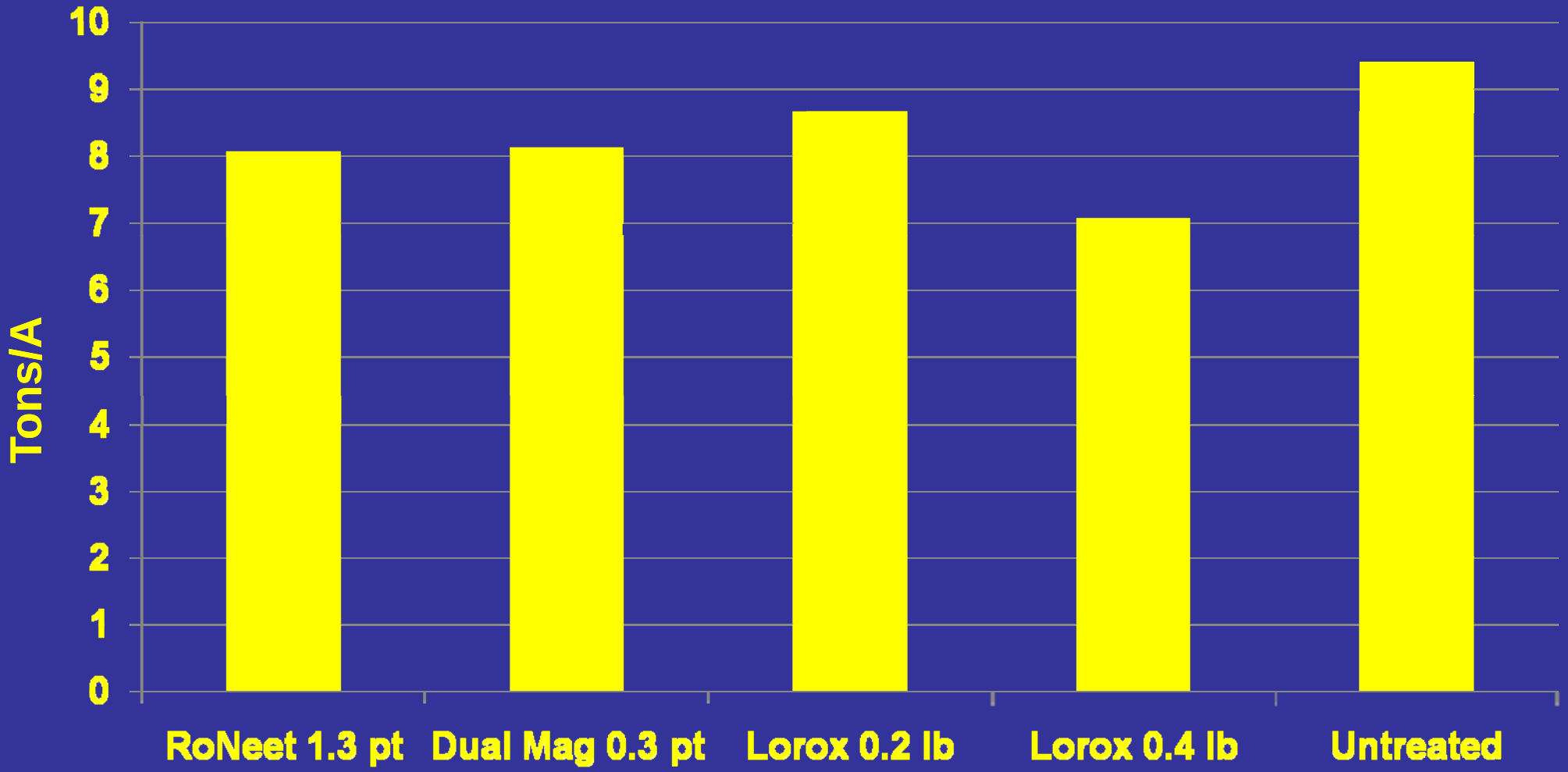
# Soil Characteristics of Five Spinach Trials

| Soil Type | OM | Sand | Silt | Clay |
|---|---|---|---|---|
| Arnold Loamy Sand | 1.2 | 62 | 18 | 20 |
| Greenfield FSL* | 0.8 | 47 | 28 | 25 |
| Chualar Loam | 0.8 | 68 | 16 | 16 |
| Metz FSL | 0.9 | 55 | 29 | 16 |
| Chualar loam | 0.9 | 73 | 18 | 9 |

* Yield reduction was observed on soil types highlighted in red

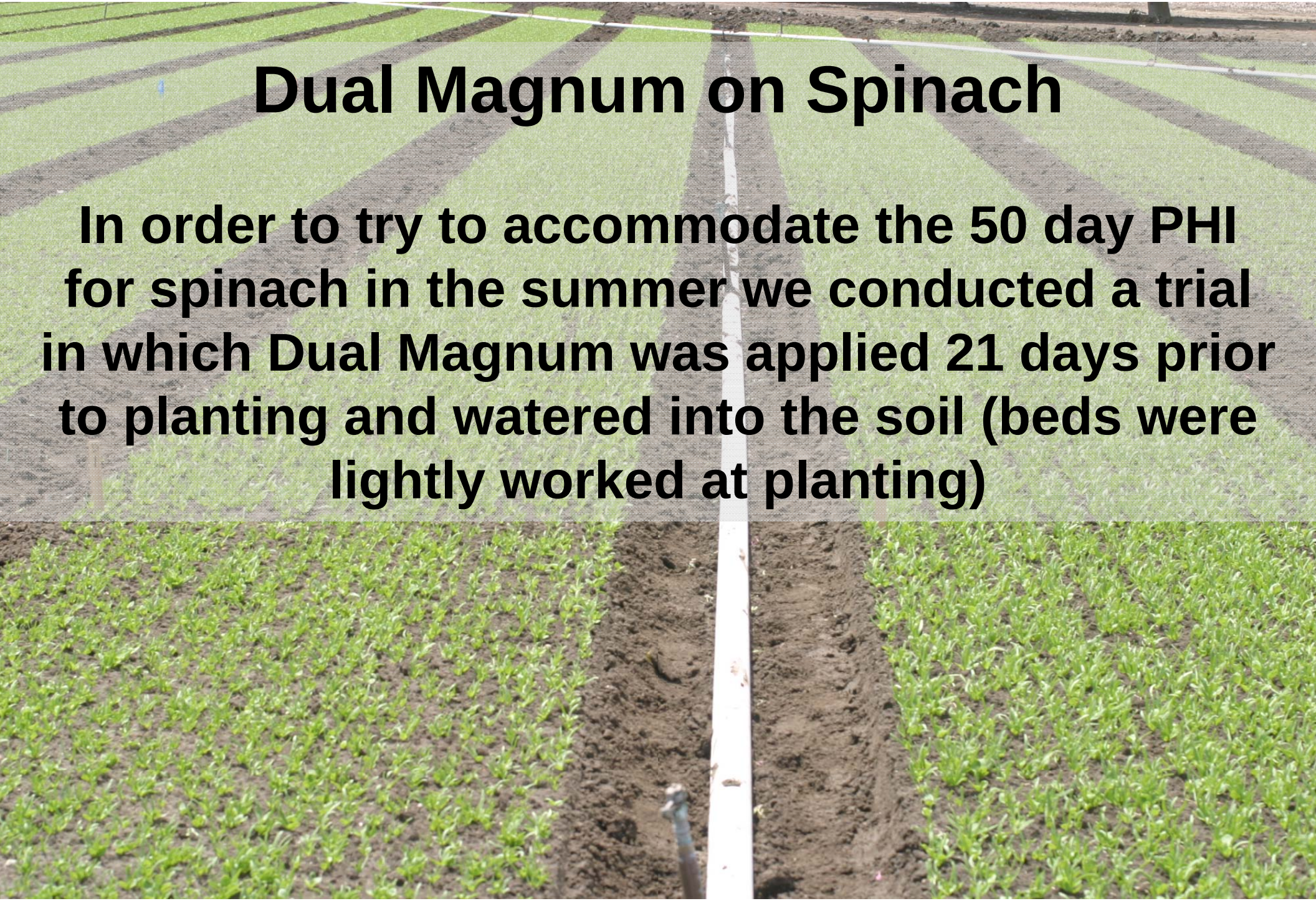
# Yield of Spinach 2008-09 Average

## Nine trials



# Lorox on Spinach Weed Control Summary

- Spinach is sensitive to Lorox at rates at and above 0.4 lbs of material/A
- On key soil types in the valley it looks to be safe, but on the coarse sandy soils of the eastside and low organic matter soils, it is too injurious

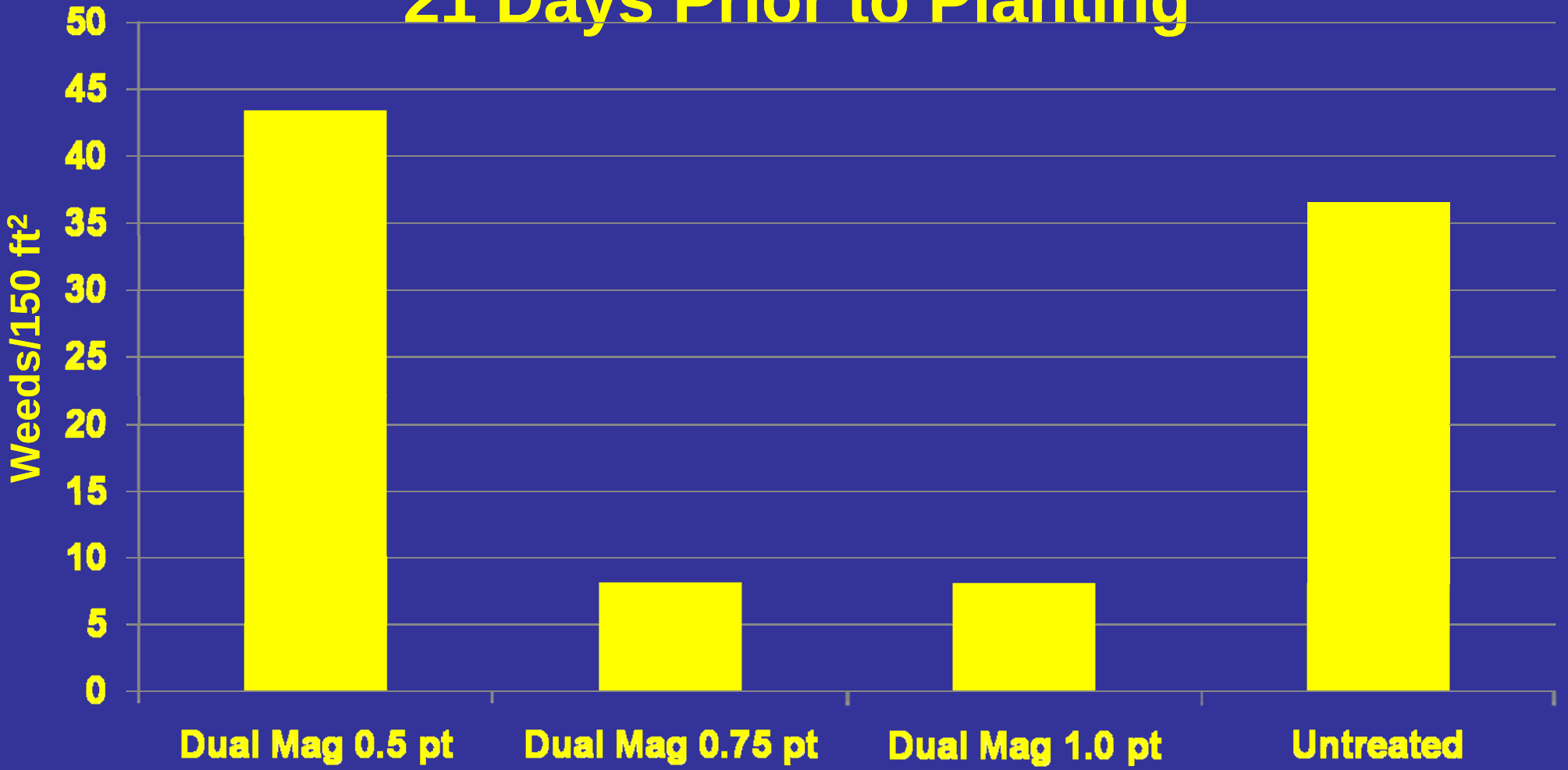


# Dual Magnum on Spinach

**In order to try to accommodate the 50 day PHI for spinach in the summer we conducted a trial in which Dual Magnum was applied 21 days prior to planting and watered into the soil (beds were lightly worked at planting)**

# Weed Counts

## Dual Magnum Applied
## 21 Days Prior to Planting



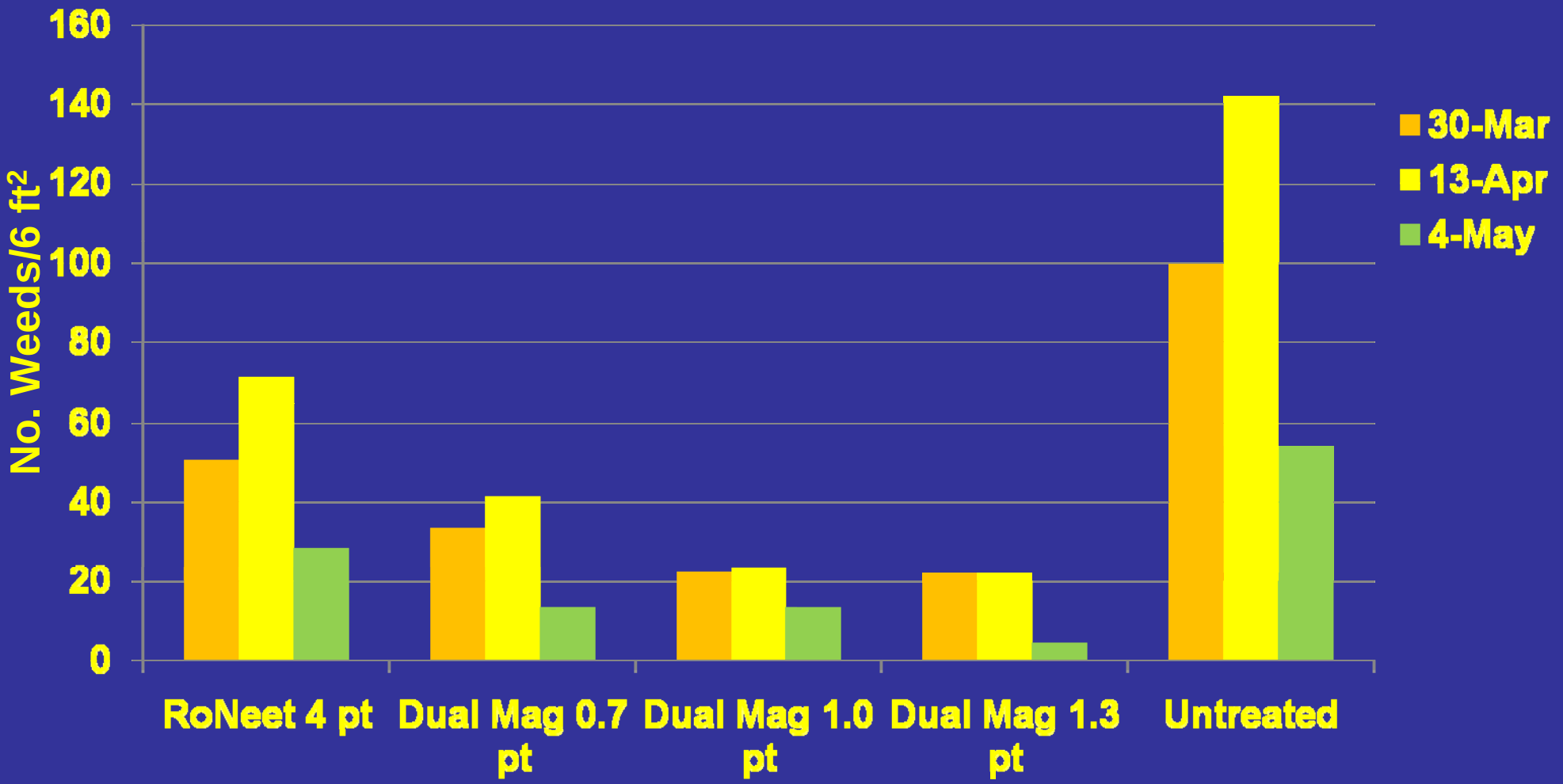
# Dual Magnum on Spinach Summary

- It is unclear when the preharvest interval for Dual Magnum will be reduced (20 days)
- In the mean time, applying the Dual Magnum prior to planting can work around the current 50 day PHI

# Beet Weed Control Trials

- Table Beets are in the same situation as spinach. They are dependent on RoNeet
- Trials were conducted to evaluate the efficacy and safety of Dual Magnum on this crop

# Number of Weeds



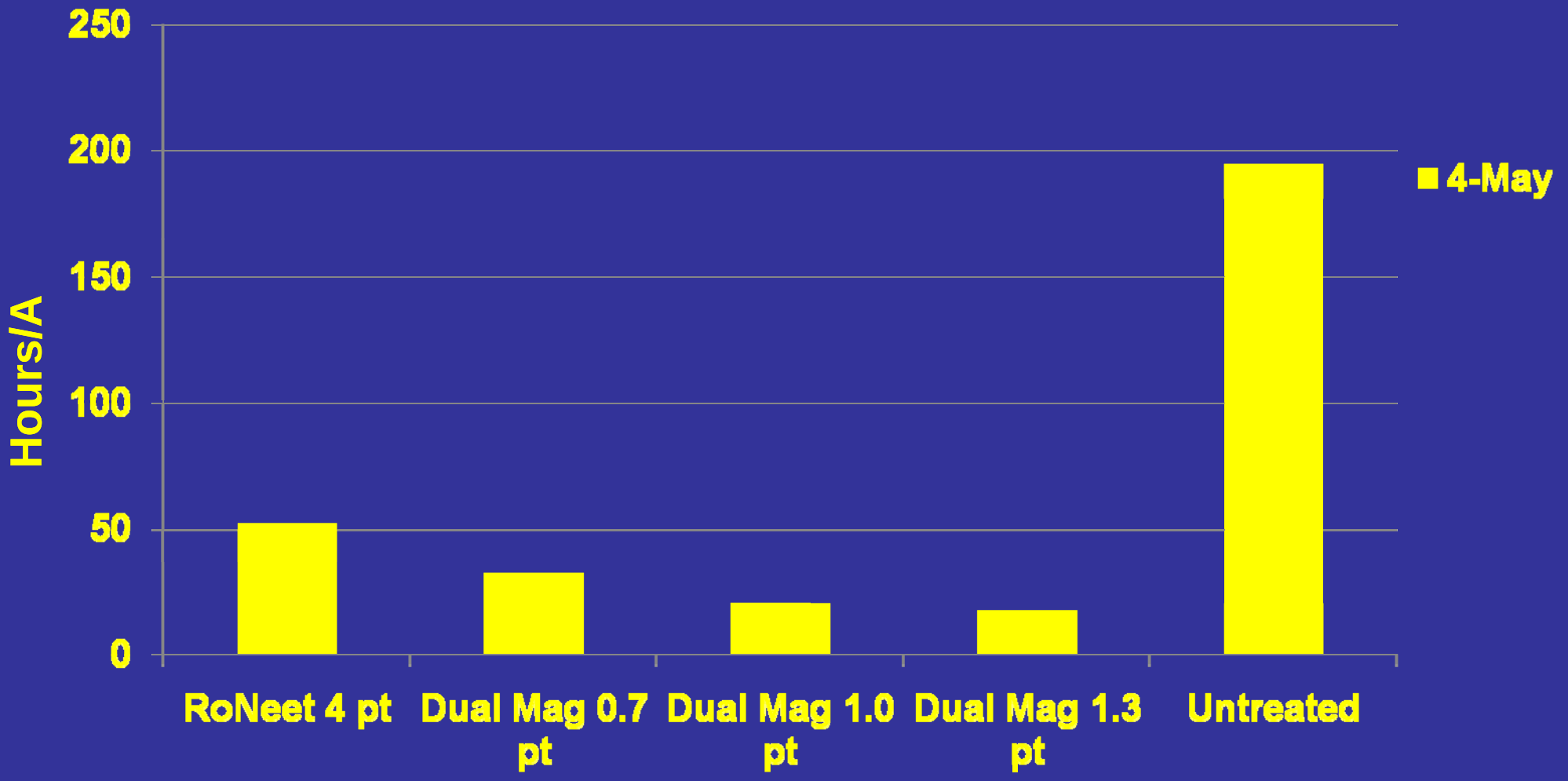
Untreated

RoNeet 4 pts

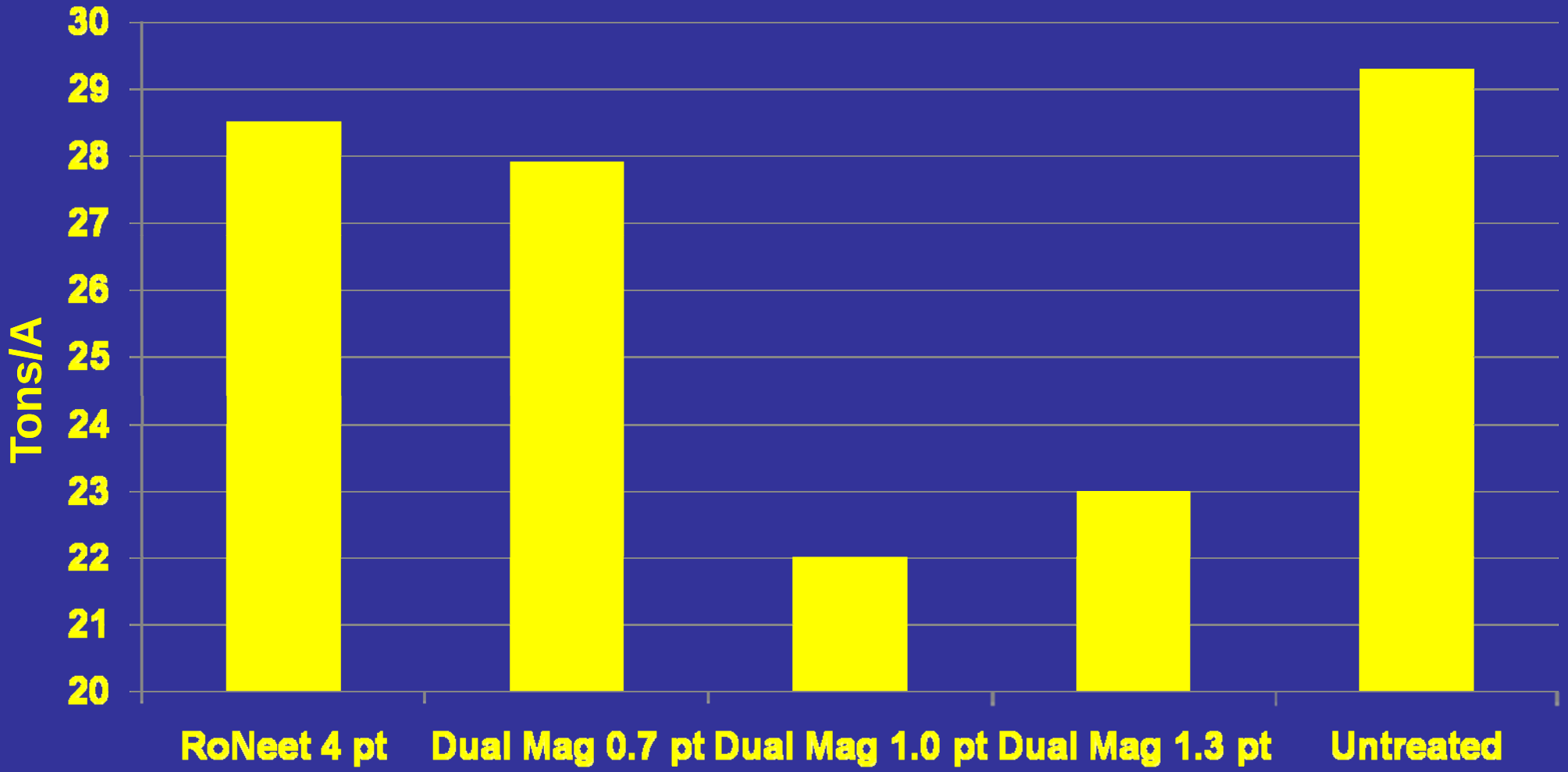
Dual Magnum 0.7 pt

Dual Magnum 1.3 pt

# Weeding Time



# Yield of Beets
## October 9



# Leek Weed Control Trials

- We explored other preemergence as well as Goal Tender post emergence on leeks

# 2009 Leek Weed Control Evaluations

| Treatment | Material/A | Application Timing |
|---|---|---|
| Untreated | ---- | ---- |
| Dacthal 6F | 1.33 gal | Pre |
| Prefar 6E | 6.0 qt | Pre |
| Prowl H2O | 33.7 oz | Pre |
| Goal Tender 4F | 8.0 oz | Pre |
| Goal Tender 4F | 16.0 oz | Pre |
| Goal Tender 4F | 24.0 oz | Pre |
| Goal Tender 4F | 4.0 oz | Post |
| Goal Tender 4F | 6.0 oz | Post |
| Goal Tender 4F | 8.0 oz | Post |

# 2009 Leek Weed Control Evaluations

| Treatment | Material/A | Application Timing | Total Weeds |
|---|---|---|---|
| Untreated | ---- | ---- | 24.7 |
| Dacthal 6F | 1.33 gal | Pre | 7.0 |
| Prefar 6E | 6.0 qt | Pre | 6.3 |
| Prowl H2O | 33.7 oz | Pre | 8.3 |
| Goal Tender 4F | 8.0 oz | Pre | 7.0 |
| Goal Tender 4F | 16.0 oz | Pre | 1.0 |
| Goal Tender 4F | 24.0 oz | Pre | 0.3 |
| Goal Tender 4F | 4.0 oz | Post | 0.3 |
| Goal Tender 4F | 6.0 oz | Post | 0.0 |
| Goal Tender 4F | 8.0 oz | Post | 0.0 |

# 2009 Leek Weed Control Evaluations

| Treatment | Material/A | Application Timing | Weed Time |
|---|---|---|---|
| Untreated | ---- | ---- | 9.8 |
| Dacthal 6F | 1.33 gal | Pre | 4.0 |
| Prefar 6E | 6.0 qt | Pre | 3.8 |
| Prowl H2O | 33.7 oz | Pre | 4.2 |
| Goal Tender 4F | 8.0 oz | Pre | 3.2 |
| Goal Tender 4F | 16.0 oz | Pre | 1.8 |
| Goal Tender 4F | 24.0 oz | Pre | 1.7 |
| Goal Tender 4F | 4.0 oz | Post | 1.5 |
| Goal Tender 4F | 6.0 oz | Post | 1.5 |
| Goal Tender 4F | 8.0 oz | Post | 1.4 |

# 2009 Leek Weed Control Evaluations

| Treatment | Material/A | Application Timing | Grams per plant |
|---|---|---|---|
| Untreated | ---- | ---- | 148 |
| Dacthal 6F | 1.33 gal | Pre | 166 |
| Prefar 6E | 6.0 qt | Pre | 158 |
| Prowl H2O | 33.7 oz | Pre | 164 |
| Goal Tender 4F | 8.0 oz | Pre | 159 |
| Goal Tender 4F | 16.0 oz | Pre | 184 |
| Goal Tender 4F | 24.0 oz | Pre | 176 |
| Goal Tender 4F | 4.0 oz | Post | 161 |
| Goal Tender 4F | 6.0 oz | Post | 156 |
| Goal Tender 4F | 8.0 oz | Post | 143 |

# Pepper Weed Control Studies

- Peppers have a wide spectrum of materials for use pre and post plant
- The biggest issue with this crop is that it is a long-season crop that can be expensive to weed later in the growth cycle

# Evaluated Control of Late Season Weeds

**Malva infestation prior to harvest**

- **Can be expensive to control**
- **Can reduce quality of peppers**

| Treatment | Application | Material/A | Malva | Total weeds |
|---|---|---|---|---|
| Untreated | --- | --- | 5.0 | 39.0 |
| Dual Magnum | Directed | 1.5 pints | 4.3 | 24.0 |
| Prowl H2O | Directed | 2.0 pints | 5.0 | 11.0 |
| Dual Magnum + Prowl H2O | Directed | 1.5 pints<br>2.0 pints | 5.3 | 12.0 |
| Outlook 6.0 | Directed | 14.0 oz | 4.3 | 29.7 |

| Treatment | Application | Material/A | Malva | Total weeds |
|---|---|---|---|---|
| Untreated | --- | --- | 5.0 | 39.0 |
| Dual Magnum<br>+ Prowl H2O | Directed | 1.5 pints<br>2.0 pints | 5.3 | 12.0 |
| Chateau | Directed | 3.0 oz | 1.0 | 9.0 |
| Chateau | Directed | 6.0 oz | 0.0 | 2.7 |
| Chateau | Shielded | 3.0 oz | 1.7 | 6.0 |
| Chateau | Shielded | 6.0 oz | 0.7 | 8.7 |
| Chateau<br>+DC 1–6184 | Directed | 3.0 oz | 0.0 | 7.7 |
| Chateau 51WG<br>+DC 1–6184 | Directed | 6.0 oz | 0.7 | 3.3 |
| Broadstar 0.25G | Broadcast | 37.6 lbs | 0.7 | 3.7 |

| Treatment | Application | Material/A | Total Weed Time |
|---|---|---|---|
| Untreated | --- | --- | 24 |
| Dual Magnum<br>+ Prowl H2O | Directed | 1.5 pints<br>2.0 pints | 10 |
| Chateau | Directed | 3.0 oz | 8 |
| Chateau | Directed | 6.0 oz | 6 |
| Chateau | Shielded | 3.0 oz | 9 |
| Chateau | Shielded | 6.0 oz | 6 |
| Chateau<br>+DC 1–6184 | Directed | 3.0 oz | 7 |
| Chateau 51WG<br>+DC 1–6184 | Directed | 6.0 oz | 6 |
| Broadstar 0.25G | Broadcast | 37.6 lbs | 7 |

# Chateau Used Layby

Untreated

Chateau @ 3 & 6 oz

Untreated

Broadstar 37 lbs/A

# 2010 Evaluations

- Broadstar is registered for ornamentals and its price structure will probably make it too expensive for use in vegetable crops
- However, on the Chateau label there is a provision for impregnating fertilizer with Chateau for use on mint, we would like to try that idea on peppers
- We are exploring the idea of obtaining a research authorization to be able to treat 100 acres of peppers with Chateau on fertilizer

# Significant Weed Issue in 2009

- Branched Broomrape
- (Orobanche ramosa)
- An outbreak occurred in a tomato field in the Hollister area
- It is a parasitic plant that has a wide host range – including lettuce
- CDFA delimited and is quarantining the infested part of the ranch

# Branched Broomrape

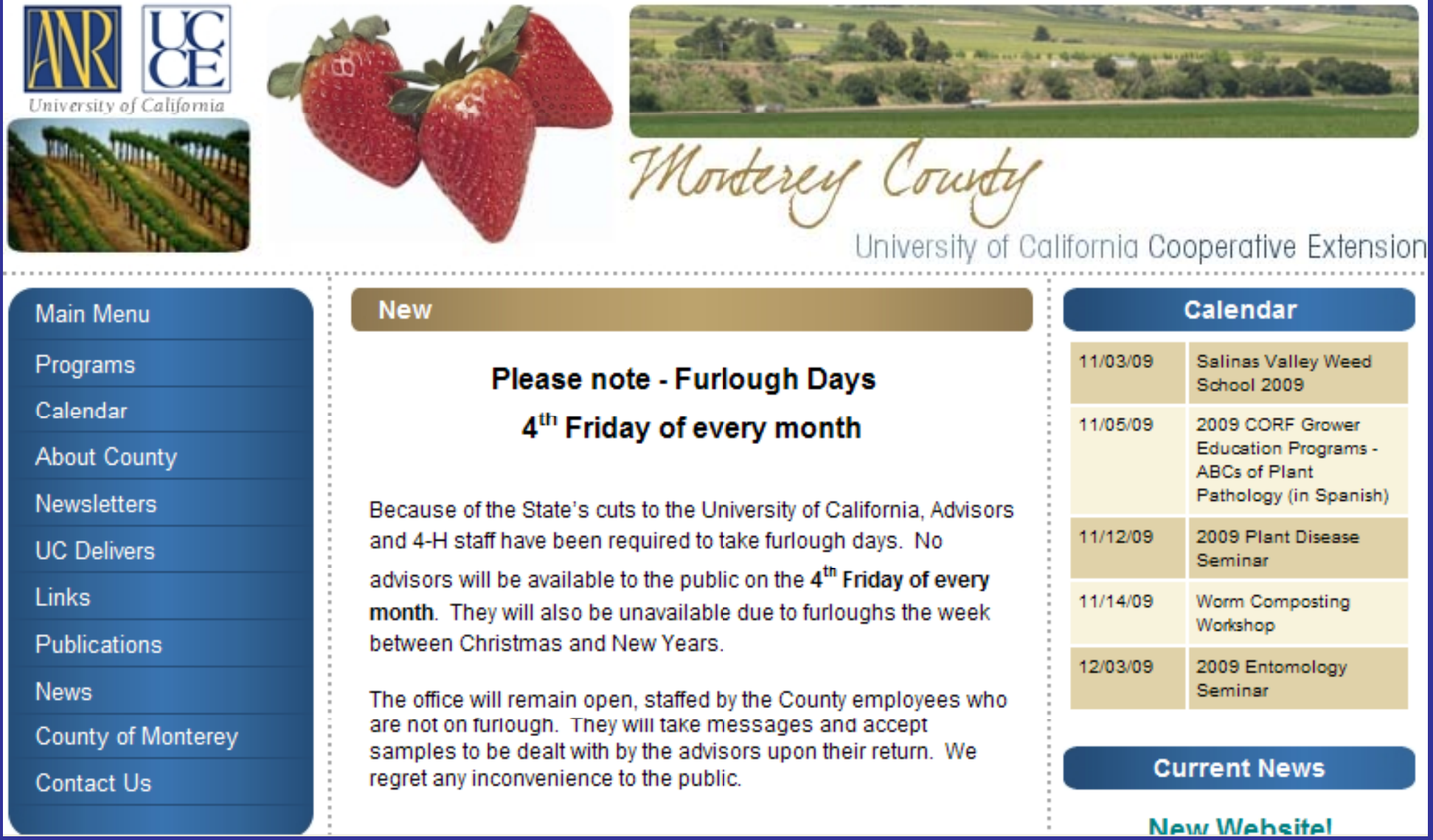
- This plant can be a serious threat to yield and productivity
- Ideally the plant should be eradicated
- Methyl Bromide is the most effective control
- The economics of eradication are difficult to accommodate in some areas

# Branched Broomrape

- Extreme care needs to be taken to avoid spread of seed of this plant on soil and equipment from affected fields

# Weed Research Reports Online

# http://cemonterey.ucdavis.edu/



## Vegetable Crops & Weed Science

Conduct an applied research and educational program in vegetable crop production and weed science for crops grown in Monterey, Santa Cruz and San Benito Counties. Production issues include soil fertility, abiotic problem diagnosis, cover crop management and new crop development. Weed identification services are provided, as well as research on weed control.

## Viticulture

Has cross-county
Extension progra
Santa Cruz Count
industry.

## Youth Devel

Youth developme
youth, youth servi
organizations in t
natural resource education, an


**Broccoli Weed Reports**

- 2007 Broccoli Post Emergence Weed Control Studies
- 2006 Broccoli Weed Pre and Post Emergence Trial
- 2006 Broccoli Weed Trial Organic
- 2004 Broccoli Weed Control Trial

**Lettuce**

- 2008 Lettuce Weed Control Studies
- 2007 Direct Seeded Lettuce Weed Control Studies
- 2007 Weed Control Study in Transplanted Lettuce
- 2007 Weed Control Studies in Drip Germinated Lettuce
- 2006 Chemigation Evaluations with Kerb on Lettuce in the Salinas Valley

**Onions - Dry Bulb**

- 2008 Dry Bulb Onion Weed Control Studies
- 2007 Dry Bulb Onion Weed Control Studies
- 2006 Dry Bulb Onion Weed Control Studies
- 2005 Dry Bulb Onion Weed Control Studies
- 2004 Dry Bulb Onion Weed Control Studies

# Acknowledgements


- All the many growers & PCA's, as well as the California Leafy Greens Research Board and chemical companies that cooperated and assisted in carrying out these trials