Weed Control Onions, Peppers and Carrots

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Metam
Paraquat
Roundup
Shark
Scythe

Dacthal
Prefar
Nortron
preemergence
to weeds

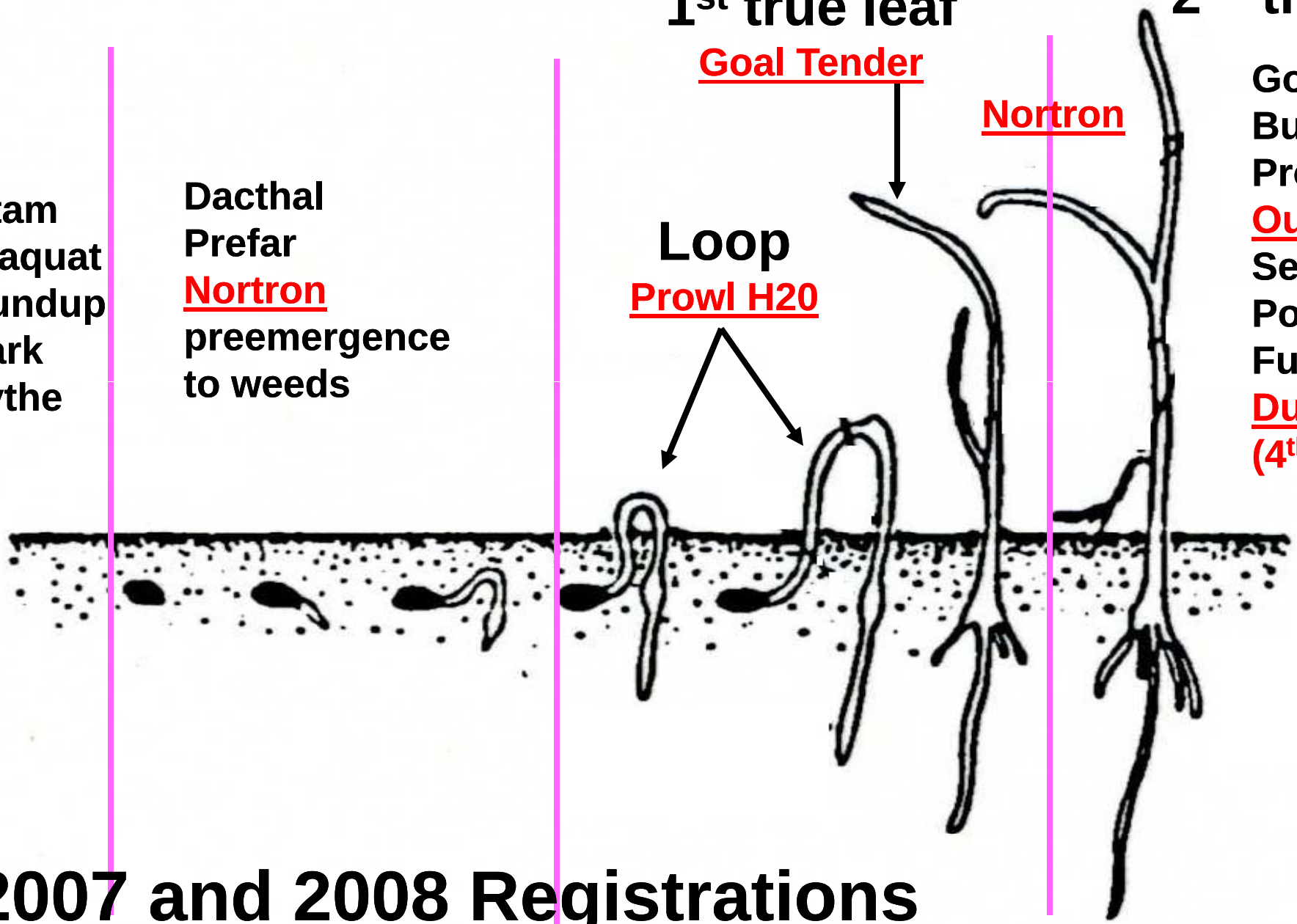
Loop
Prowl H20

1st true leaf
Goal Tender

Nortron

2nd true leaf

Goal
Buctril
Prowl
Outlook
Select Max
Poast
Fusilade
Dual Magnu
(4th True Lea



2007 and 2008 Registrations

Weed Control Research

- Nortron – registered in 2008, but little research on its efficacy and safety
- Goal Tender – low rates used preemergence
- Outlook and Dual Magnum for yellow nutsedge control

- Basagran – post emergence weed control and burn down of nutsedge
- Ultra low rates of Chateau

2008 Onion Weed Trial

Primary weed nettleleaf goosefoot

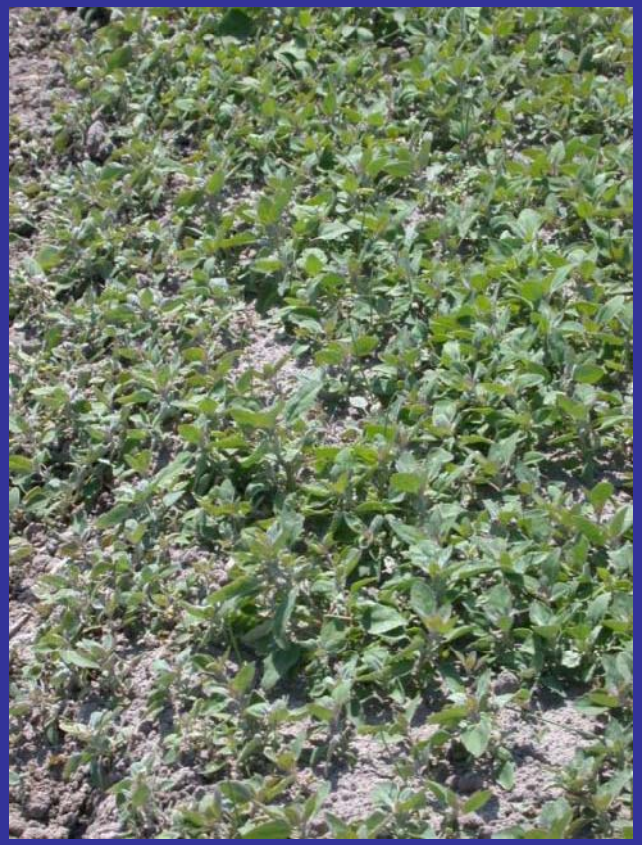
Treatment	Rate/A	Timing	Weed time hrs/A
Untreated	----	----	330
Dacthal Goal Tender	1.3 gallon 6.0 ounces	Pre post	2
Nortron Goal Tender	16 ounces 6.0 ounces	Pre Post	9
Nortron Goal Tender	32 ounces 6.0 ounces	Pre post	11
Nortron Nortron	16 ounces 16 ounces	Pre Post	125
Nortron Nortron	32 ounces 16 ounces	Pre Post	64
Nortron	16 ounces	Preemergence	127
Nortron	24 ounces	Preemergence	89
Nortron	32 ounces	Preemergence	78

2008 Onion Weed Trial

Primary weed nettleleaf goosefoot

Treatment	Rate/A	Timing	Bulbs/A 1000's
Untreated	----	----	105
Dacthal Goal Tender	1.3 gallon 6.0 ounces	Pre post	105
Nortron	16 ounces	Pre	102
Nortron	24 ounces	Pre	96
Nortron	32 ounces	Pre	73
Nortron Nortron	16 ounces 16 ounces	Pre Post	101
Nortron Nortron	32 ounces 16 ounces	Pre Post	77
Nortron Goal Tender	16 ounces 6.0 ounces	Pre Post	105
Nortron Goal Tender	32 ounces 6.0 ounces	Pre post	92

Fewer bulbs in the 32 oz vs 16 oz treatment. In 2009 Nortron at 32 ounces pre had the lowest no. of bulbs/A as well



Untreated

Nortron 16 oz

Nortron 32 oz

Summary

- Nortron preemergence at 24 and 32 ounces/A was nearly as effective as Dacthal in the 2008 trial where lambsquarter was the main weed
- It was not effective on lambsquarter post emergence
- When followed by post emergence applications of Goal Tender (1st true leaf) it provided excellent weed control

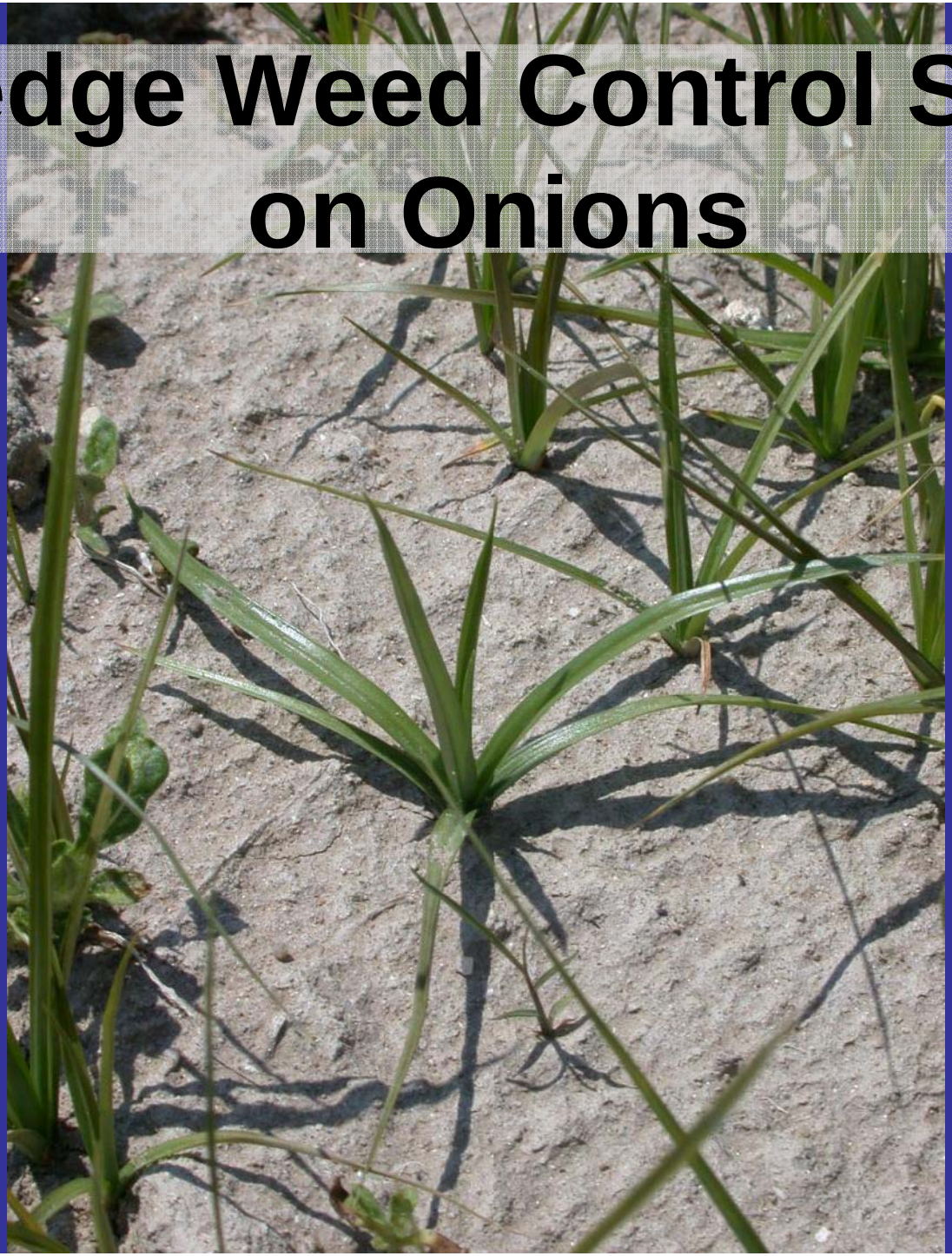
Low Rate of Goal Tender Used Preemergence on Onions

Treatment	Rate/A	Timing	% Weed Control	Weed time hrs/A
Untreated	----	----	0	330
Dacthal Goal Tender	1.3 gallon 6.0 ounce	Pre post	99	2
Goal Tender	0.5 ounce	Pre	76	45
Goal Tender	1.0 ounce	Pre	85	27
Goal Tender	2.0 ounce	Pre	95	10

Low Rate of Goal Tender Preemergence

- Low rates of Goal Tender (0.5-0.2 ounces/A) looked promising as a preemergence weed control strategy
- The 2 ounce rate reduce the stand of onions in this trial

Nutsedge Weed Control Studies on Onions

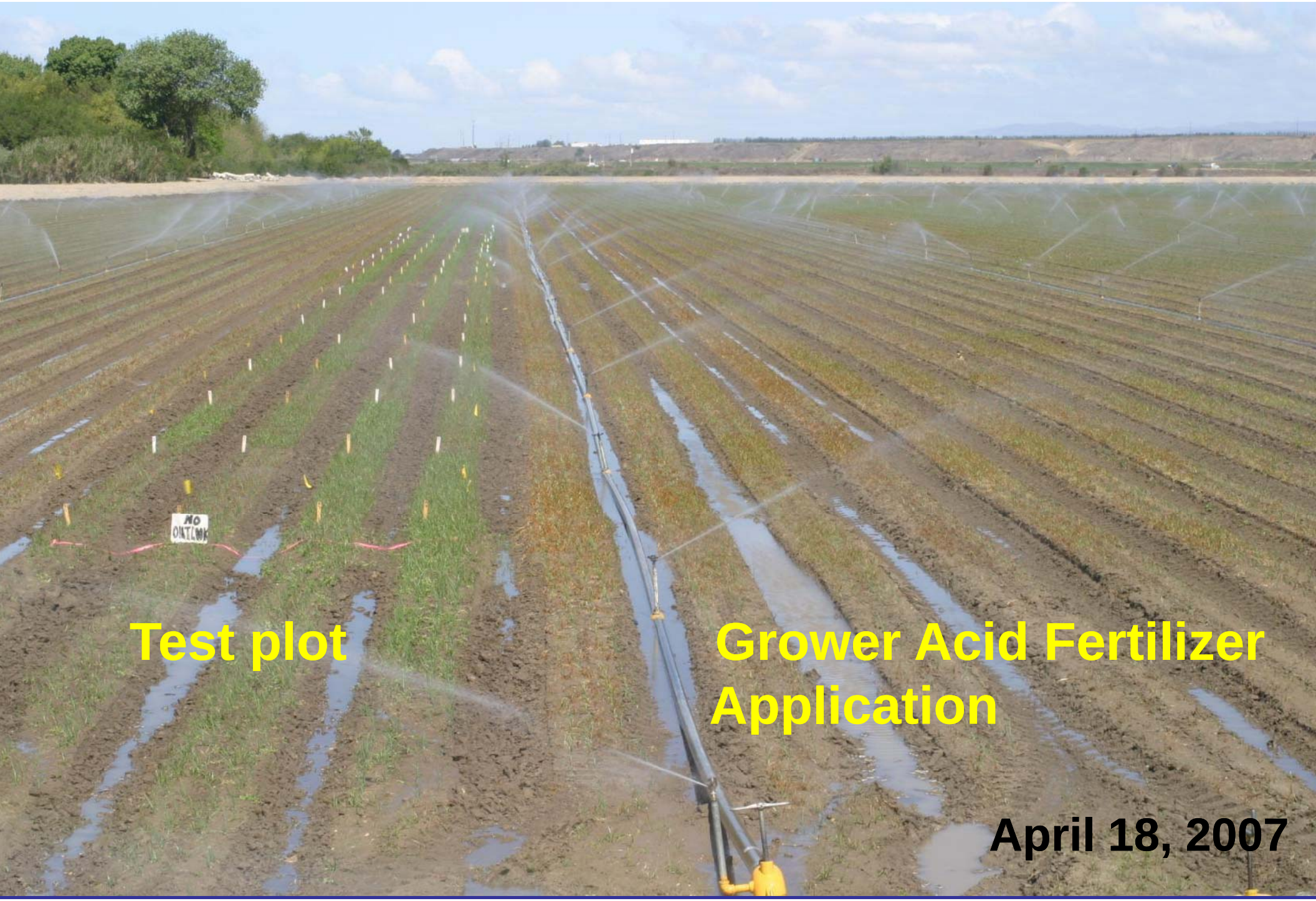


Background

- Both Outlook and Dual Magnum are chloroacetamides (mitosis inhibitors)
- Need to apply and activate prior to the emergence of nutsedge; they have no postemergence activity
- Kills shoots as they try to emerge through treated soil

Timing of Nutsedge Control

- Both Outlook and Dual Magnum need to be applied and activated prior to the emergence of nutsedge to be effective
- However, it is more common in our area for nutsedge to be emerged prior to the 2nd true leaf stage
- Question is, how can we make this Outlook and Dual Magnum work?


Test plot
Grower Acid Fertilizer Application
April 18, 2007

- **At the 2nd true leaf stage nutsedge was well developed**

Burn Back Nutsedge (with 7-7-0-7) Prior to Outlook Application

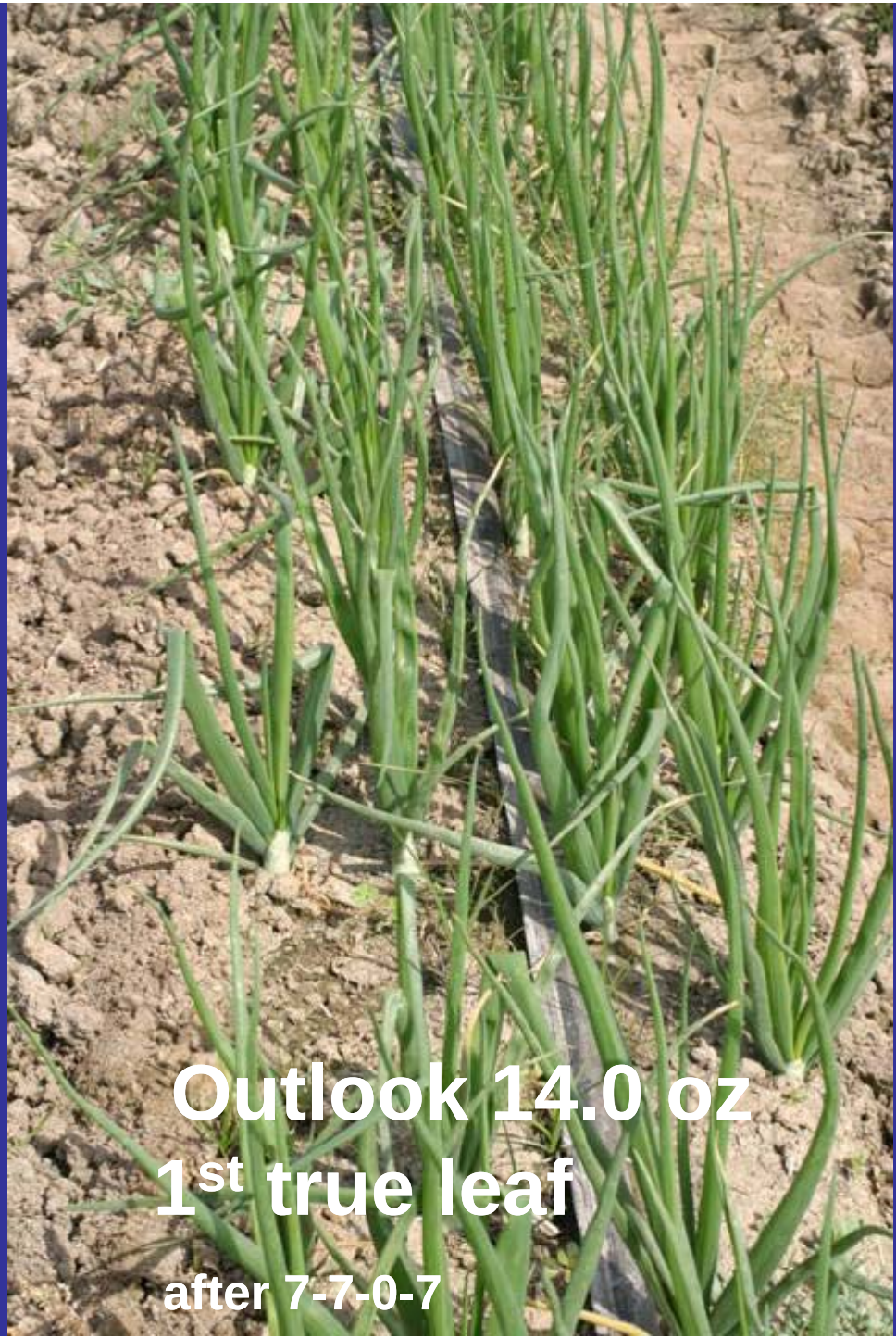
Treatment	Material/A	Application
7-7-0-7 Fb Outlook 6.0 Fb Outlook 6.0	35 gallons 7.0 oz 7.0 oz	Post 1 t. leaf 14 days later
7-7-0-7 Fb Outlook 6.0	35 gallons 14.0 oz	Post 1 t. leaf
7-7-0-7 Fb Outlook 6.0 Fb Outlook 6.0	35 gallons 7.0 oz 7.0 oz	Post 2 t. leaf 14 days later
7-7-0-7 Fb Outlook 6.0	35 gallons 14.0 oz	Post 2 t. leaf
Untreated	----	----

Post Acid Fertilizer Application


7-7-0-7
Outlook 7.0 + 7.0
1st true leaf

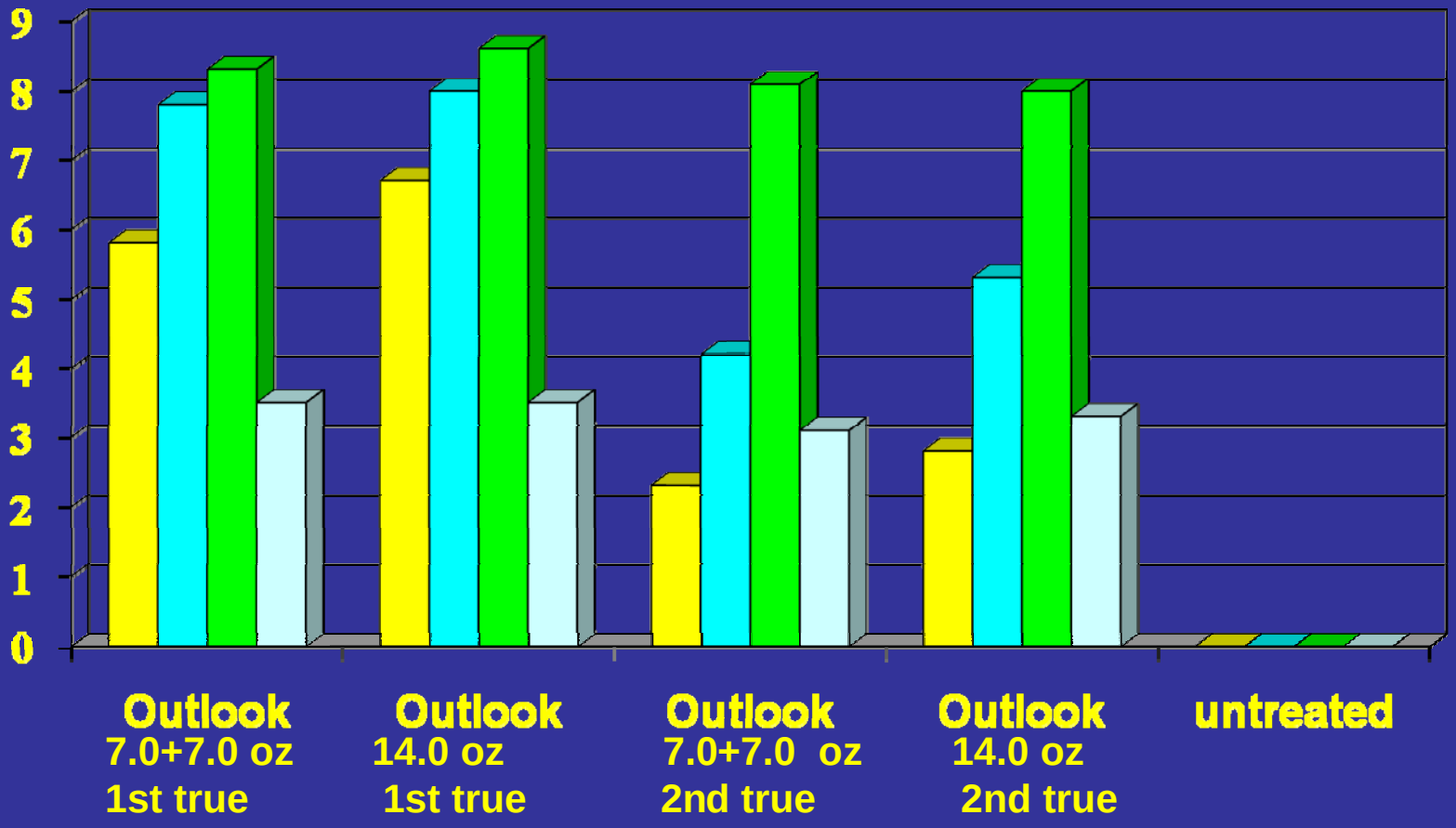

May 8, 2007


Untreated

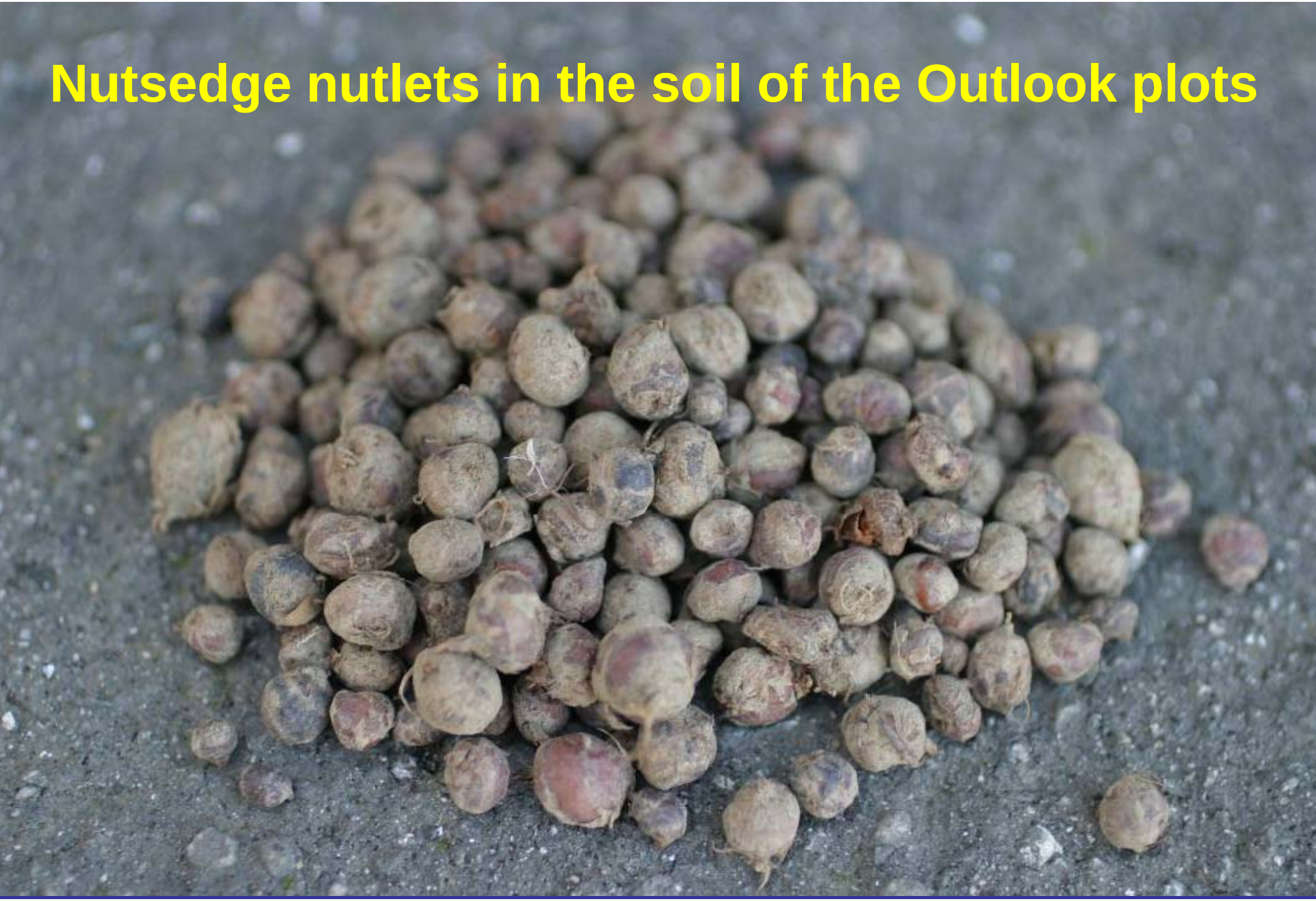

Outlook 14.0 oz
1st true leaf
after 7-7-0-7

Weed Rating
Outlook After Acid Fertilizer

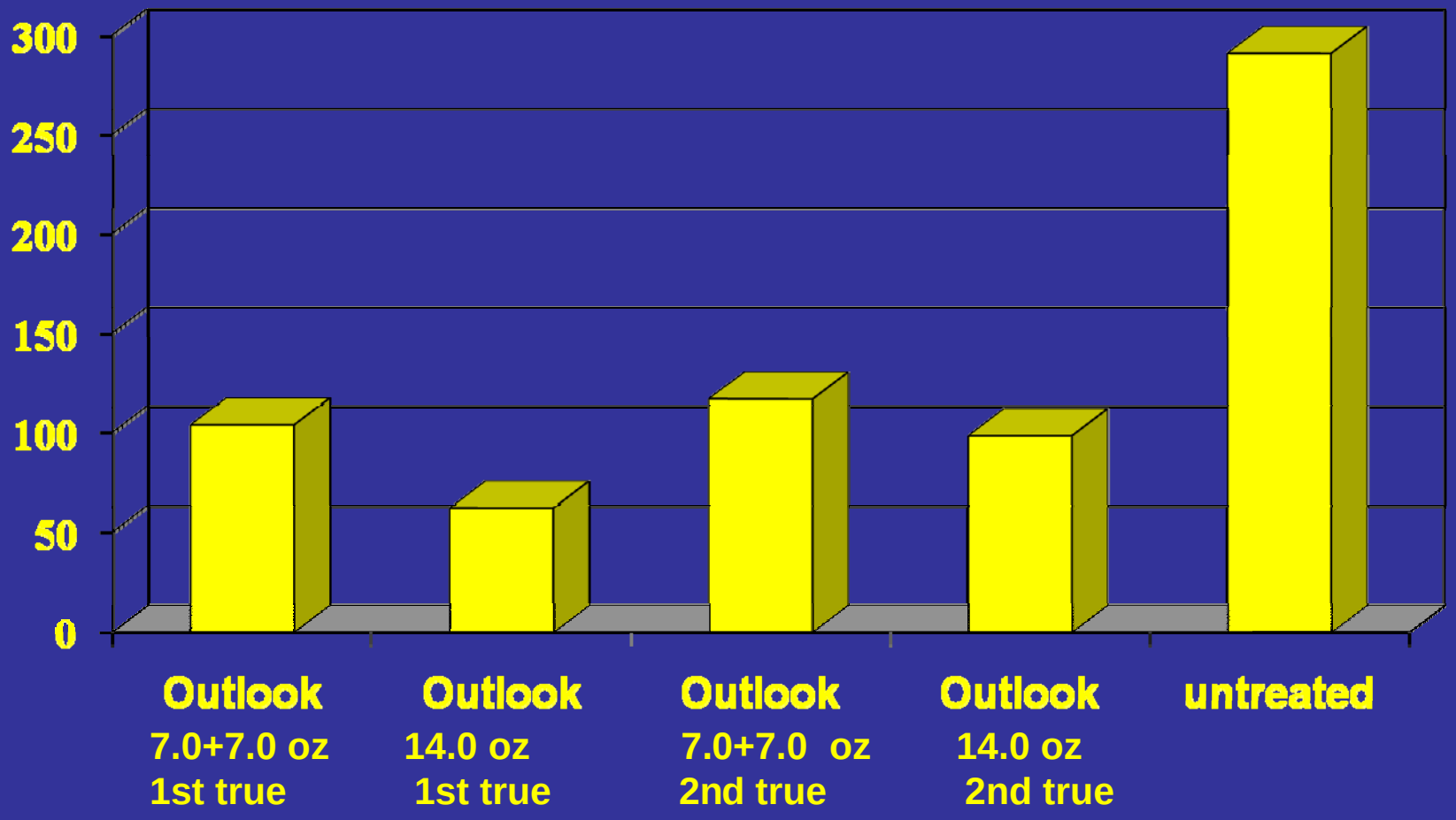
April 23; May 4; June 1; and August 9



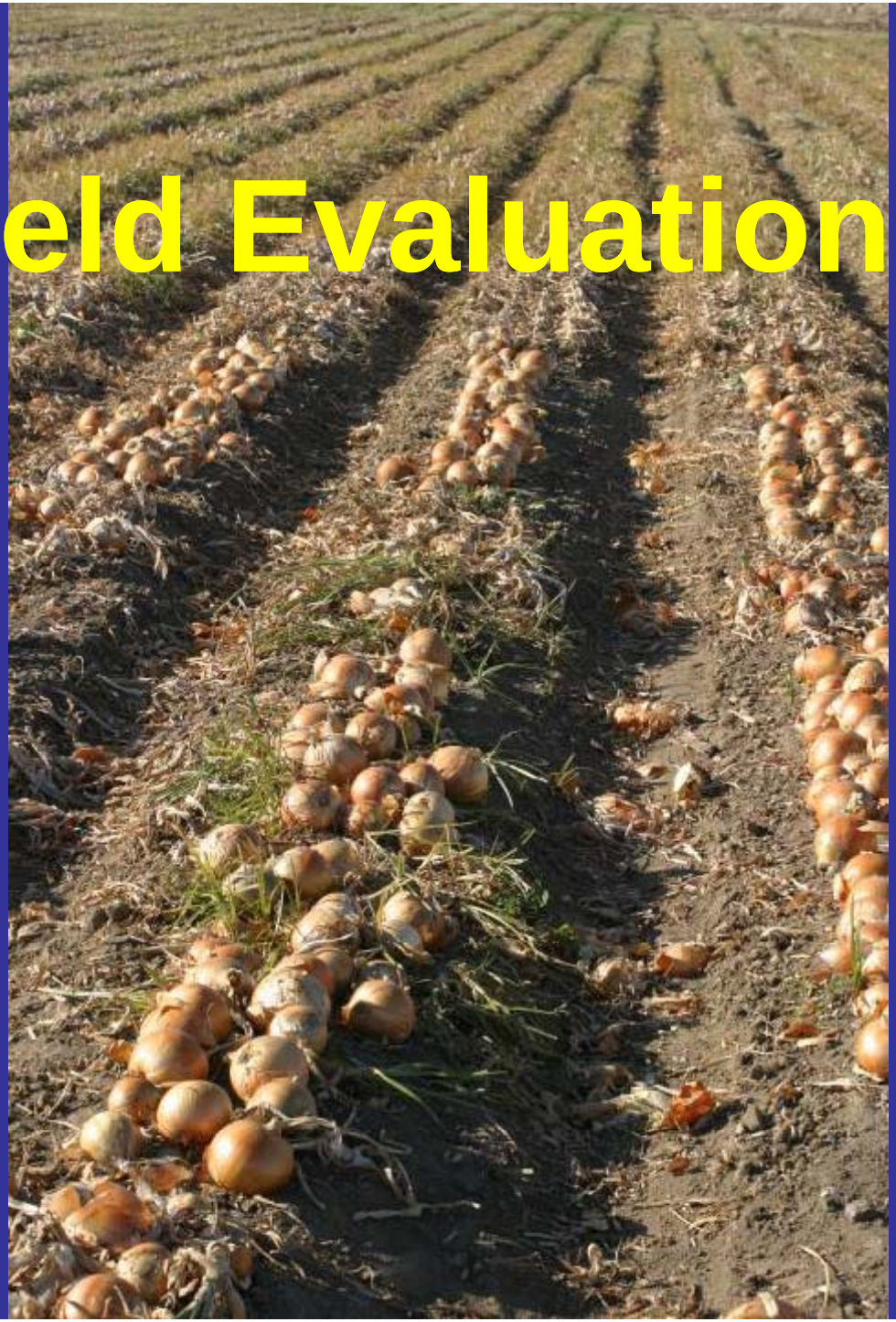
Nutsedge nutlets in the soil of the Outlook plots



Nutsedge Tubers Per 1000 cm^3 of Soil



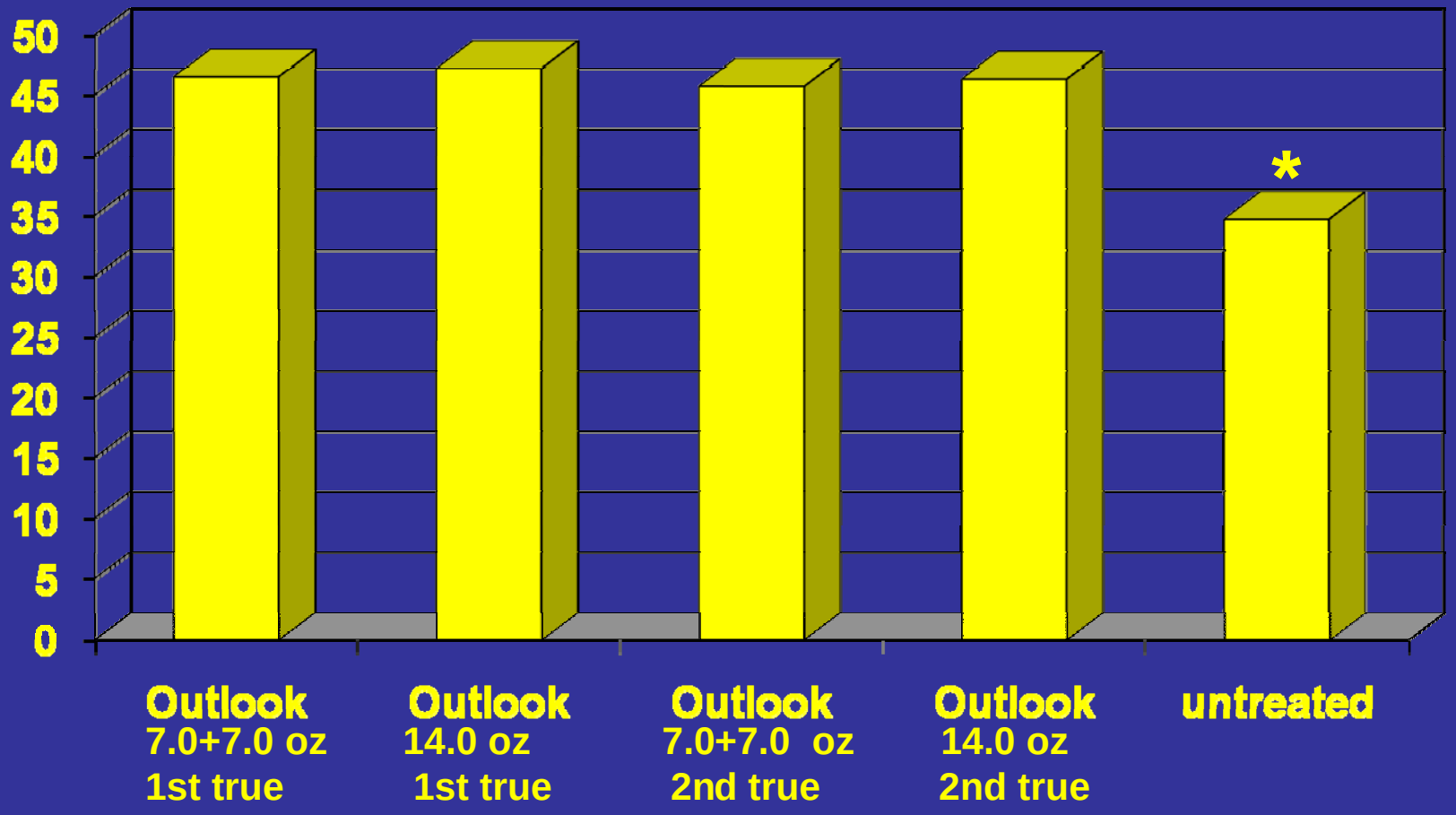
Yield Evaluations



Onion Trial Heavy Infestation

With 7-7-0-7

Yield – Tons/A



Summary

- Burning back nutsedge with acid fertilizer provides an opportunity to make Outlook work if nutsedge is emerged by the 2nd true leaf stage
- There may be a yield reduction from the caustic action of the fertilizer but it is much less than letting the nutsedge go uncontrolled

Summary

- Basagran was tested as a burnback material for nutsedge and was effective and has been safe on the onions
- We have tested the use of Outlook at the first true leaf stage, but it is unclear if BASF will approve that change on the label
- Dual Magnum went the other way and it was registered for use at the 4^{th} true leaf stage

Tips on the use of Outlook

- It needs to be applied and activated within a day or so of the acid fertilizer
- Applying with irrigation is a good strategy to apply it and activate it at the same time
- If it is not activated quickly the nutsedge may regrow and it will not work
- Do test strips of fertilizers to determine the formulation and rate to effectively burn back the nutsedge

Pepper Weed Control Studies

Weed Control Materials Registered for Peppers in California

- Preplant
  - Paraquat
  - Roundup
  - Metam Sodium
- Preemergence
  - Goal[1,2]
  - Prefar
  - Devrinol
  - Treflan
  - Dual Magnum
  - Prowl H_2O
- Post Transplant
  - Devrinol
- Layby
  - Dacthal
  - Dual Magnum
  - Prowl H_2O
- Post emergence
  - Sandea
  - Poast
  - Prism

1-Preformed beds up to 30 days prior to transplanting, must work beds; 2-applied to shaped beds and tarped (approved in 2004)

Difficult to control weeds

Hairy Nightshade

Little mallow

Evaluated Control of Late Season Weeds

Malva infestation prior to harvest

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 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 + Prowl H2O	Directed	1.5 pints 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 +DC 1–6184	Directed	3.0 oz	0.0	7.7
Chateau 51WG +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 + Prowl H2O	Directed	1.5 pints 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 +DC 1–6184	Directed	3.0 oz	7
Chateau 51WG +DC 1–6184	Directed	6.0 oz	6
Broadstar 0.25G	Broadcast	37.6 lbs	7

Chateau Used Layby

- **There were no yield differences in either trial but a trend to lower yields was seen in the Gilroy trial**

Carrots Weed Control Trials

- Carrots have an effective herbicide that provides excellent weed control
- Syngenta is planning to register Caparol on this crop which will provide yet another effective material
- The carrot (including cilantro) registration packet was submitted to EPA this year

- **In preparation for the eventual registration of Caparol on carrots we conducted a trial to look at application rates and timing**

Treatment	Timing	Rate/A
Caparol	Preemergence	2 pints
Caparol	Preemergence	4 pints
Caparol FB Caparol	Preemergence Post emergence	2 pints 4 pints
Caparol FB Caparol	Preemergence Post emergence	4 pints 4 pints
Caparol	Post emergence	2 pints
Caparol	Post emergence	4 pints
Lorox FB Lorox	Preemergence Post emergence	1.5 pound 1.5 pound
Untreated	----	----

Treatment	Timing	Rate/A	Percent Weed Control
Caparol	Preemergence	2 pints	54
Caparol	Preemergence	4 pints	100
Caparol FB Caparol	Preemergence Post emergence	2 pints 4 pints	97
Caparol FB Caparol	Preemergence Post emergence	4 pints 4 pints	100
Caparol	Post emergence	2 pints	90
Caparol	Post emergence	4 pints	95
Lorox FB Lorox	Preemergence Post emergence	1.5 pound 1.5 pound	98
Untreated	----	----	0

Treatment	Timing	Rate/A	Phyto
Caparol	Preemergence	2 pints	0.0
Caparol	Preemergence	4 pints	0.0
Caparol FB Caparol	Preemergence Post emergence	2 pints 4 pints	3.5
Caparol FB Caparol	Preemergence Post emergence	4 pints 4 pints	3.5
Caparol	Post emergence	2 pints	1.8
Caparol	Post emergence	4 pints	3.0
Lorox FB Lorox	Preemergence Post emergence	1.5 pound 1.5 pound	0.0
Untreated	----	----	0.0


C 10
C 4
Untreated
Caparol 4 pt pre

Hours/Acre to Weed Carrots

Summary

- Caparol will be an excellent addition to the weed control materials
- It is safe and provides excellent weed control preemergence
- I would be cautious about its use post emergence as it caused yellowing

Yellow Nutsedge Control Evaluations

- Use of Dual Magnum and Outlook to inhibit yellow nutsedge
- Applied with the 2nd Lorox application
- Lorox burns the nutsedge back and Dual Magnum and Outlook inhibit subsequent reemergence

Treatments	Material/A	Weed rate
Dual Magnum	0.67 pint	8.3
Dual Magnum	1.00 pint	9.0
Dual Magnum	1.33 pint	9.2
Dual Magnum	1.67 pint	9.2
Outlook	7.0 ounces	9.0
Outlook	14.0 ounces	8.8
Untreated	----	0.0

Treatments	Material/A	Phyto Aug 19	Phyto Sept 10
Dual Magnum	0.67 pint	1.0	0.0
Dual Magnum	1.00 pint	1.3	0.0
Dual Magnum	1.33 pint	2.0	0.3
Dual Magnum	1.67 pint	2.7	0.7
Outlook	7.0 ounces	2.7	3.0
Outlook	14.0 ounces	3.3	4.7
Untreated	----	0.0	0.0

Treatments	Material/A	Roots ton/A
Dual Magnum	0.67 pint	5.1
Dual Magnum	1.00 pint	3.5
Dual Magnum	1.33 pint	4.1
Dual Magnum	1.67 pint	5.0
Outlook	7.0 ounces	4.1
Outlook	14.0 ounces	4.4
Untreated	----	5.6

Untreated

Dual 1.33 pt

Outlook 14 oz

Summary

- We need to conduct further trials using a directed spray to avoid contact as much as possible with the carrot foliage
- If we can avoid the phytotoxicity problems, this technique looks promising

Acknowledgements

- PCA's and growers that cooperated and assisted on all of these trials