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Weed Control in Lemons

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Future Citrus Herbicide Developments

- Potential changes in glyphosate formulations in Arizona
  - Roundup Weathermax, other trade names
- Registration of Prowl for bearing citrus
- Potential registration of Chateau
  - Flumioxazin, V53482
  - Burndown, contact herbicide - broadleaves.
  - Has preemergence soil activity
- Potential registration of Aim
  - Carfentrazone-ethyl
  - Burndown, contact herbicide - broadleaves
- Potential registration of Envoke
  - Trifloxysulfuron, CGA362622
  - Postemergence nutsedge and broadleaf weed control, some grass suppression

Roundup Comparison Treatment

Roundup / Roundup Ultramax

Many morningglory plants are severely injured but survive.

Aim @ 0.016 lb ai/A +1 % COC at 12 in tall cotton

Aim @ 0.016 lb ai/A +1 % COC at 12 in tall cotton

Aim @ 0.016 lb ai/A +1 % COC at 12 in tall cotton

Stem injury

Leaf injury

Cotton injury ranged between 0 (comparison treatment) and 8%.

Valor @ 0.031 lb ai/A + Roundup @0.75 lb ae/A + AMS at the 12 in tall growth stage of cotton

Valor @ 0.031 lb ai/A + Roundup @0.75 lb ae/A + AMS at the 12 in tall growth stage of cotton

Note leaf injury

Envoke (trifloxysulfuron or CGA362622)

- Envoke has also been investigated as a post-direct treatment in cotton.
- Has significant broadleaf activity and activity on nutsedge species unlike Aim or Chateau.

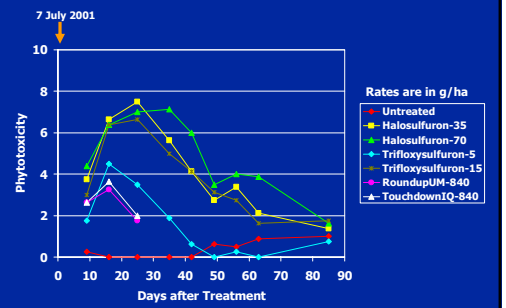
Envoke Applications for Purple Nutsedge Control

Materials and Methods

The experiments were conducted on a native population of purple nutsedge at the Campus Agricultural Center of the University of Arizona in Tucson, Arizona.

The experiments were conducted Aug 1999 through March 2000 and July 2001 through March 2002.

Phytotoxicity after a Single Herbicide Application



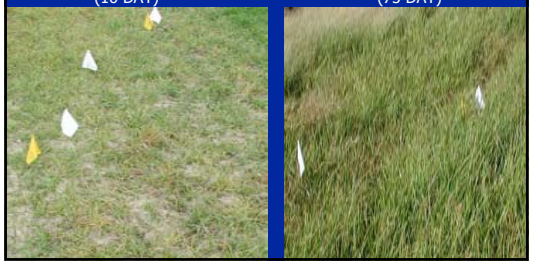
Phytotoxicity after 1 Application of Herbicide

Trifloxysulfuron 15 g/ha

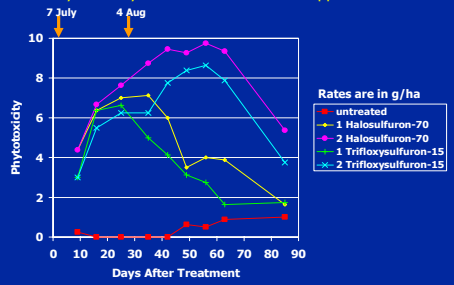
(Initial Application Date 7 July 2001)

23 July 2001 (16 DAT)

28 September 2001 (75 DAT)



Phytotoxicity of 1 versus 2 herbicide applications



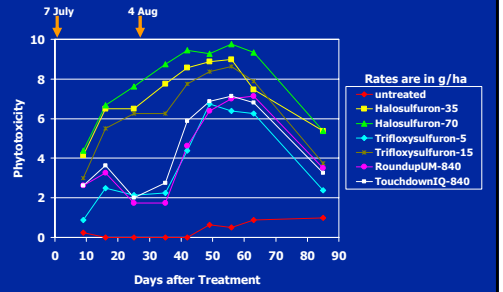
Phytotoxicity on 28 September 2001
Halosulfuron (70 g/ha)

1 application on 7 July

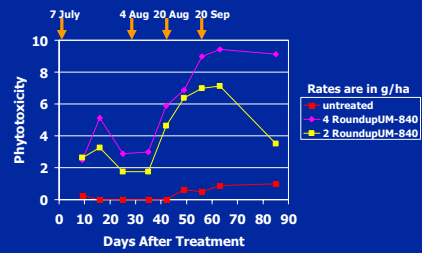
Applications on 7 July and 4 Aug

Phytotoxicity on 28 September 2001
Two Envoke applications @ 15 g/ha

Phytotoxicity after Two Herbicide Applications



Phytoxicity of 2 vs. 4 applications of Roundup Ultramax



Phytotoxicity on 28 September 2001

Roundup UltraMax (840 g/ha)

Applications on 7 July and 4 Aug

Applications on 7 July, 4 Aug, 20 Aug and 20 Sep

Envoke @ 0.007 lb ai/A + 0.5% NIS at the 12 in tall growth stage of cotton

Envoke @ 0.007 lb ai/A + 0.5% NIS at the 12 in tall growth stage of cotton

Envoke @ 0.007 lb ai/A + Touchdown @ 0.75 lb ae/A at the 12 in tall growth stage of cotton

Touchdown @ 0.75 lb ae/A at the 12 in tall growth stage of cotton

Evaluating an Optical Weed Sensing Herbicide Sprayer and Weed Management in Citrus and Pecans

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WeedSeeker Sprayer - Kawasaki 3010 4WD Mule.

WeedSeeker/Kawasaki Mule Sprayer

WeedSeeker/Kawasaki Mule Sprayer

WeedSeeker Sprayer

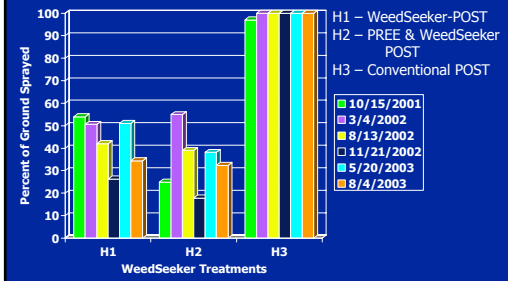
Kubota/Conventional Sprayer

H1 – WeedSeeker Sprayer, Glyphosate Only

H2 – WeedSeeker Sprayer, PRE + Glyphosate

H3- Conventional Sprayer – Glyphosate Only

Percent of Ground Surface Sprayed – Yuma, AZ

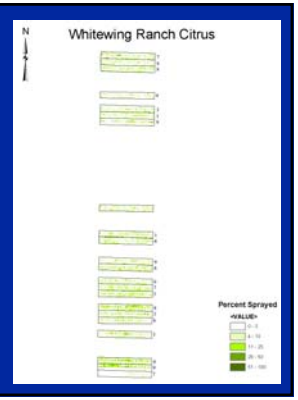


Optical Weed Sensing Sprayer/Postemergence Herbicides – White Wing Citrus, 6/25/03

Conventional Sprayer/Postemergence Herbicides – White Wing Citrus, 6/25/03

Whitewing Ranch weed spray map generated in October 2003 using a Trimble AgGPS 132 DGPS receiver (WAAS correction) and a custom datalogger from the University of Tennessee.

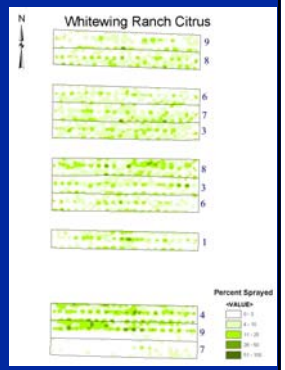
Plots in replication 3 were not mapped due to technical difficulties.



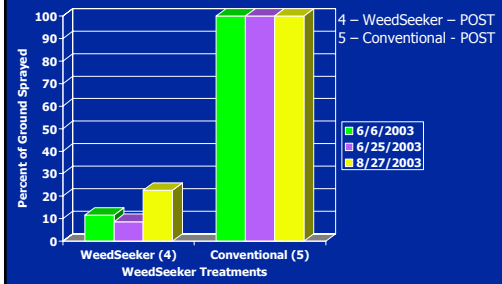
Whitewing Ranch weed spray map for plots in replication 3 at the southern edge of the orchard block.

The datalogger checked nozzle valves 300 times per second to determine when the nozzles were open and spraying.

Percent sprayed is the percentage of the time the nozzles were spraying in 1 sec intervals. The sprayer was traveling at 6 mph or 8.8 ft/s.



Percent of Ground Surface Sprayed – Dateland, AZ



White Wing Ranch, Hyder, AZ on August 14, 2003 After 1.5" of Rainfall

FICO – Vegetative Strip in Panel Middles

FICO - Conventional Sprayer – 6/26/03

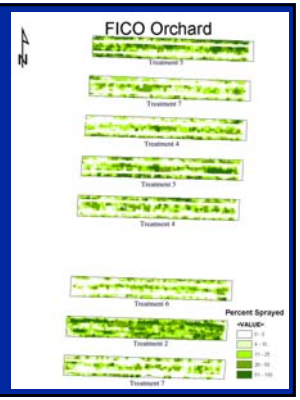
FICO-Optical Weed Sensing Sprayer – 6/26/03

FICO pecan orchard weed spray map generated in September 2003 using a Trimble AgGPS 132 DGPS receiver (WAAS correction) and a custom datalogger from the University of Tennessee.

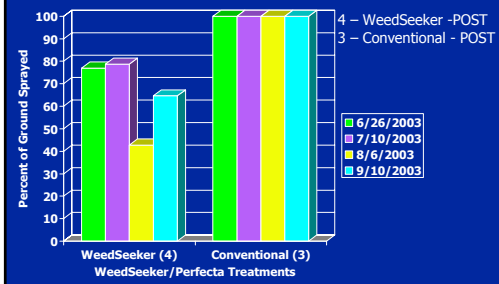
FICO pecan orchard weed spray maps for plots in replication 1 and part of replication 2 at the southern end of the orchard block.

The datalogger checked nozzle valves 300 times per second to determine when the nozzles were open and spraying.

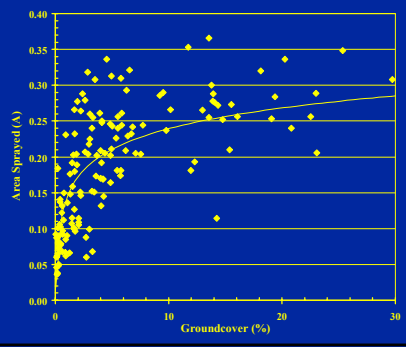
Percent sprayed is the percentage of the time the nozzles were spraying in 1 sec intervals. The sprayer was traveling at 6 mph or 8.8 ft/s.



Percent of Ground Surface Sprayed – Sahuarita, AZ



WeedSeeker Area Sprayed versus Groundcover (11/01 - 8/03)



Evaluating the Optical Weed Sensing Sprayer Technology – Current Results and Future Plans

- WeedSeeker sprayer optically detects and sprays weeds, not bare ground
- Yuma, AZ - Chemical and spray volume was reduced an average of 57%, postemerge with WeedSeeker, for six spray operations during 2001 – 2003 and 65% for the same spray operations using a preemerge plus the WeedSeeker.
- Hyder, AZ – Spray volume has been reduced an average of 85% so far in 2003 using the WeedSeeker sprayer.
- Sahuarita, AZ – Spray volume has been reduced an average of 34% so far in 2003 using the WeedSeeker sprayer.

Evaluating the Optical Weed Sensing Sprayer Technology – Current Results and Future Plans

- Use of GPS and a receiver with GIS to:
  - Map postemergence spray applications, superimpose several application maps and produce a weed density map.
  - Spray preemergence herbicide based on the weed map generated
    - Collaboration with the University of Tennessee (Dr. John Wilkerson) where the data logger was constructed. UT is assisting in map production.
- Goal of expanding project to include multiple geographical locations
- Collaboration with Trent Teegerstrom (Ag Resource Economics)
  - Tree Crop budgets for comparing conventional sprayer costs with optical weed detecting sprayer technology.