

Aldicarb Degradation in Flood Irrigated South Texas Soils in Relation to Citrus Pest Efficacy

Raul Ray Hinojosa

Graduate Research Assistant

Texas A&M University-Kingsville

Dick and Mary Lewis Kleberg College of Agriculture, Natural
Resources, and Human Sciences

Department of Agronomy & Resource Sciences

Advisor – Dr. Shad D. Nelson



Aldicarb Degradation in Flood Irrigated South Texas Soils in Relation to Citrus Pest Efficacy

Currently there are approximately 28,000 acres of citrus production in the Rio Grande Valley, Texas.

Control of pests vital for production of high quality and high yield of citrus fruit.

Asian Citrus Psyllid (*Diaphorina citri*)



Aldicarb Degradation in Flood Irrigated South Texas Soils in Relation to Citrus Pest Efficacy

The utilization of aldicarb, a broad spectrum pesticide, is considered to be an effective treatment against Asian Citrus Psyllid (*Diaphorina citri*) and mites in citrus production.

Several factors affecting the movement of aldicarb include:

- Soil pH
- Soil Temperature
- Percent and type of organic matter
- Flood Irrigation practices
- Soil clay content



Aldicarb Degradation in Flood Irrigated South Texas Soils in Relation to Citrus Pest Efficacy

OBJECTIVES

This research project aims at evaluating the impacts of Temik[®] 15G and irrigation application treatments on:

- 1) The movement and fate of aldicarb in heavy textured soils.
- 2) Impact of organic amendments effecting aldicarb adsorption to soil.
- 3) The efficacy of aldicarb used in the control of citrus pests, i.e. Asian citrus psyllid, citrus leaf minor, and citrus rust mite.
- 4) Irrigation impacts on the uptake of aldicarb by citrus plants.
- 5) Fruit Yield, fruit quality, and economic sustainability.

Aldicarb Degradation in Flood Irrigated South Texas Soils in Relation to Citrus Pest Efficacy

Flood Irrigation Timing & Aldicarb Application Field Layout



Rio Red Grapefruit
Field Block 2

6 inch Flood Irrigation

Pre & Post Irrigated					Post-irrigated					← Irrigation Days After Application					
21-D	14-D	7-D	3-D	0-D	0-D	3-D	7-D	14-D	21-D						
x	x	x	x	x						x	x	x	x	x	Rep 1
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x	Control				x	x	x	x	x	Rep 2	
x	x	x	x	x					x	x	x	x	x		
x	x	x	x	x					x	x	x	x	x		
x	x	x	x	x					x	x	x	x	x		
x	x	x	x	x					x	x	x	x	x		
x	x	x	x	x						x	x	x	x	x	Rep 3
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	Rep 4
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	Rep 5
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x						x	x	x	x	x	
x	x	x	x	x	x	x	x	x	x	x	x	x	x		

x = Tree

Aldicarb Degradation in Flood Irrigated South Texas Soils in Relation to Citrus Pest Efficacy



Positive Displacement Microband Applicator



Soil Sample Collection



Narrow Border Flood Irrigation



Pest Evaluation



Aldicarb Degradation in Flood Irrigated South Texas Soils in Relation to Citrus Pest Efficacy

EXPECTED RESULTS

Effectiveness of aldicarb will decrease with immediate flood irrigation (0 Days) when compared to the last flood irrigation (14 Days). In addition, soils with high clay content along with organic matter will be better suited to adsorb with aldicarb, reducing leaching, than sandy soils with low organic matter. Furthermore, as aldicarb is reduced from the root zone of grapefruit trees, the efficacy will be affected negatively.

Aldicarb Degradation in Flood Irrigated South Texas Soils in Relation to Citrus Pest Efficacy

REFERENCES

- Coopedge, J.R, D.L. Bull., and R.L. Ridgeway., 1977. *Movement and persistence of aldicarb in certain soils*. Arch. of Envir. Contam. and Toxicology 5 (2): 129-141.
- El-Aswad, F. Ahmed., 2007. *Effect of organic amendments on aldicarb sorption-desorption and soil-bound residue*. J. of Appl. Sci. Res. 3(11): 1437-1448.
- Kuseske, D.W., B.R. Funke., and J.T. Shulz., 1974. *Effects and persistence of Baygon (Propoxur) and Temik (Aldicarb) insectides in soil*. Plant and Soil 41: 255-269.
- Risher, J. and H. Choudhury., 1992. *Aldicarb*. Int. J. Biometeorol. 36: 58-60.
- Smelt, J.H., Leistra, M., Houx, N.W.H., and Dekker A., 1978. *Conversion rates of aldicarb and its oxidation product in soils. I. Aldicarb sulphone^a*. Pestic. Sci. 9: 279-285.
- Wilson, C.P., J. F. Foos., R.L. Jones., 2004. *Pulsed losses and degradation of aldicarb in a South Florida Agriculture Watershed*. Arh. Environ. Contam. Toxicol. 48: 24-31.
- <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

Aldicarb Degradation in Flood Irrigated South Texas Soils in Relation to Citrus Pest Efficacy

Questions?

Comments?

Thank you