

# Recent Developments in Weed Resistance in Mississippi and the Mid-South

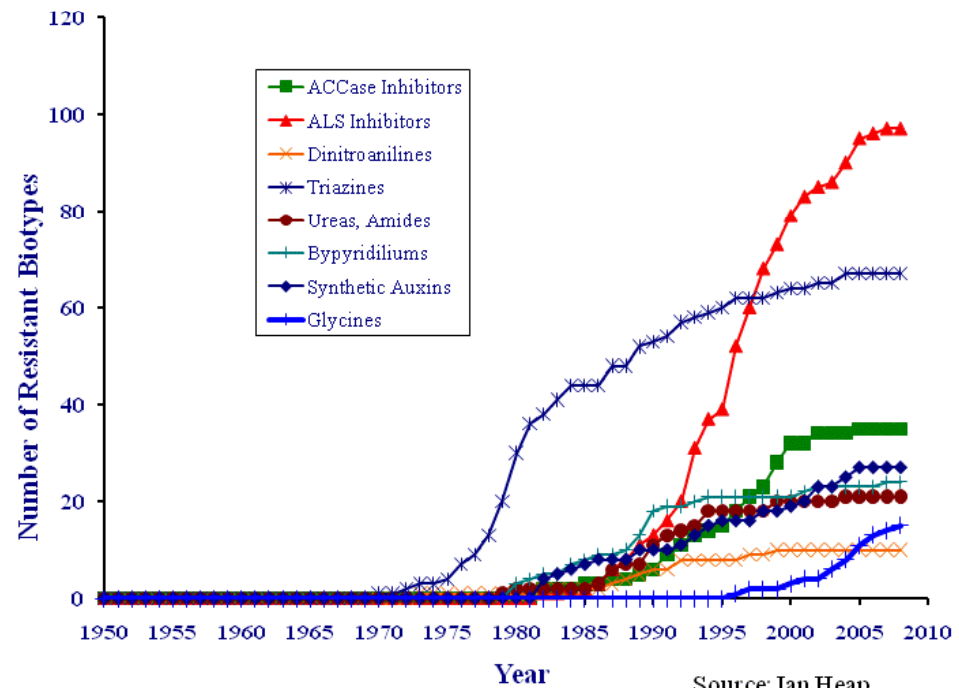
Vijay K. Nandula

Delta Research and Extension Center  
Mississippi State University

November 10, 2010

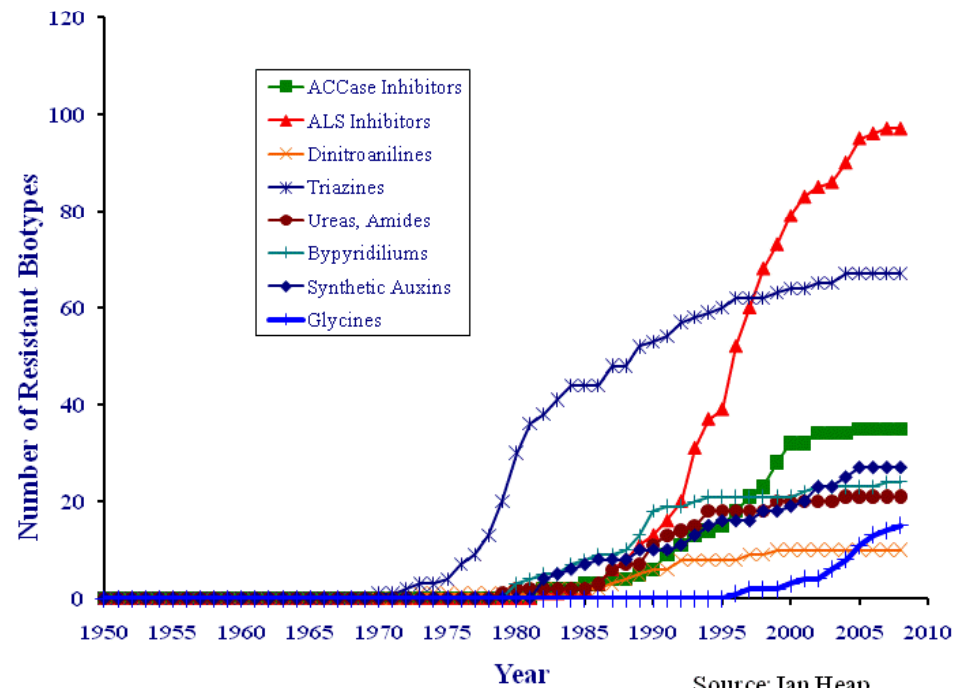
# Herbicide Resistance Worldwide

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Source: Ian Heap  
<http://WeedScience.com>

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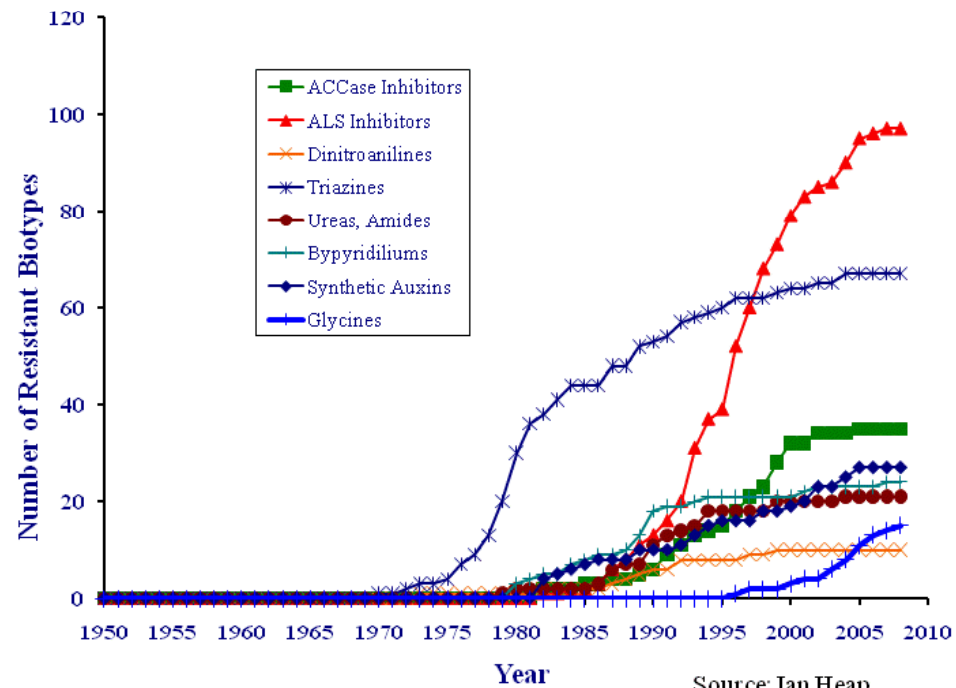


as of November 2, 2010

Source: Ian Heap  
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# Herbicide Resistance Worldwide

- 348 Resistant Biotypes



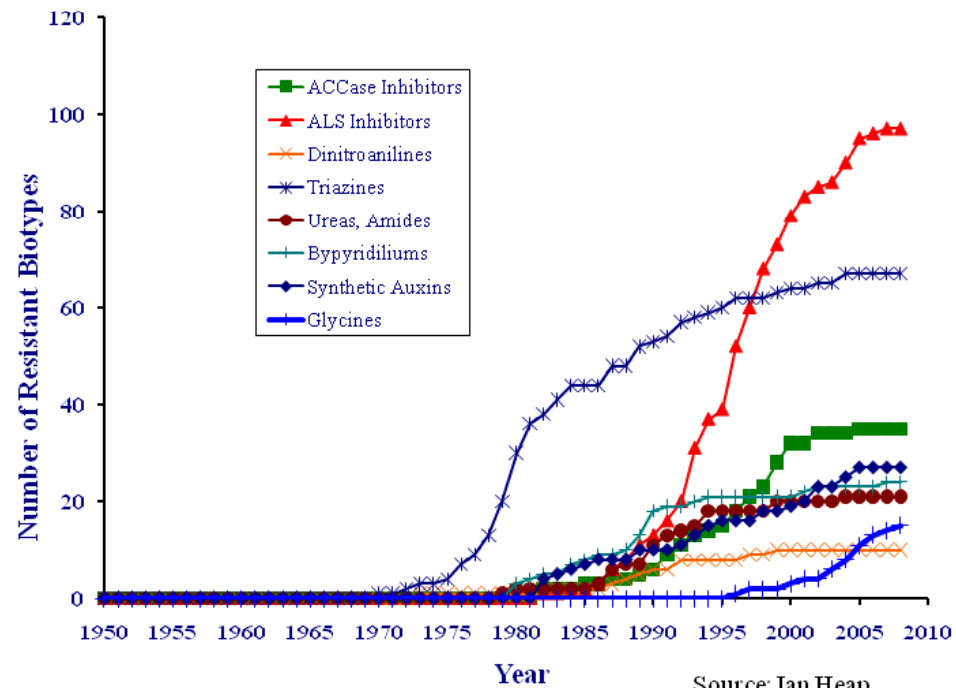
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# Herbicide Resistance Worldwide

- 348 Resistant Biotypes
- 194 Species (114 dicots and 80 monocots)

as of November 2, 2010

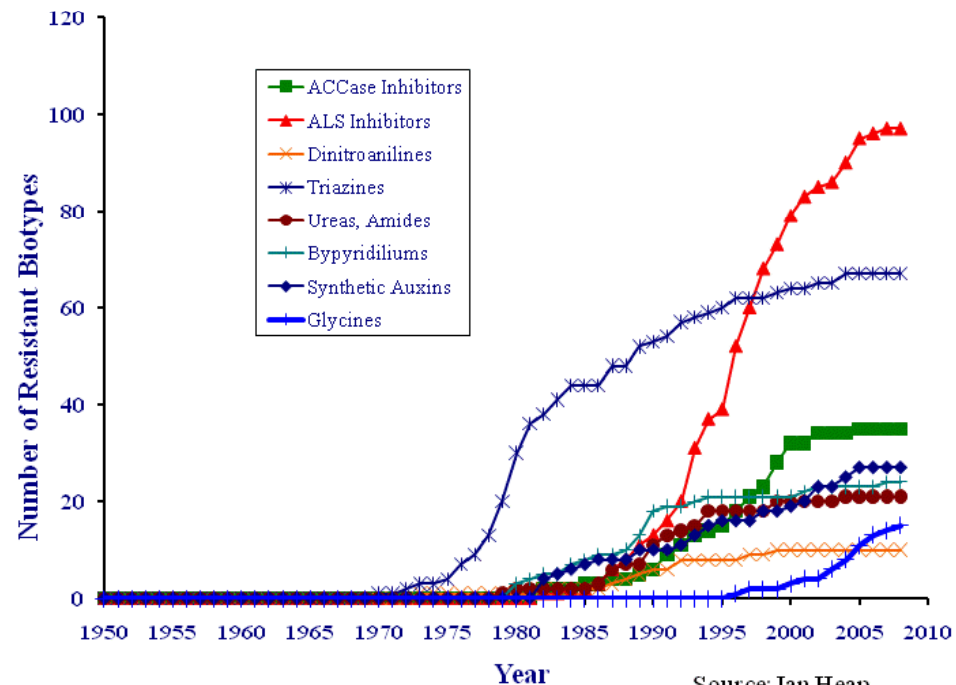


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# Herbicide Resistance Worldwide

- 348 Resistant Biotypes
- 194 Species (114 dicots and 80 monocots)
- Over 400,000 fields

as of November 2, 2010

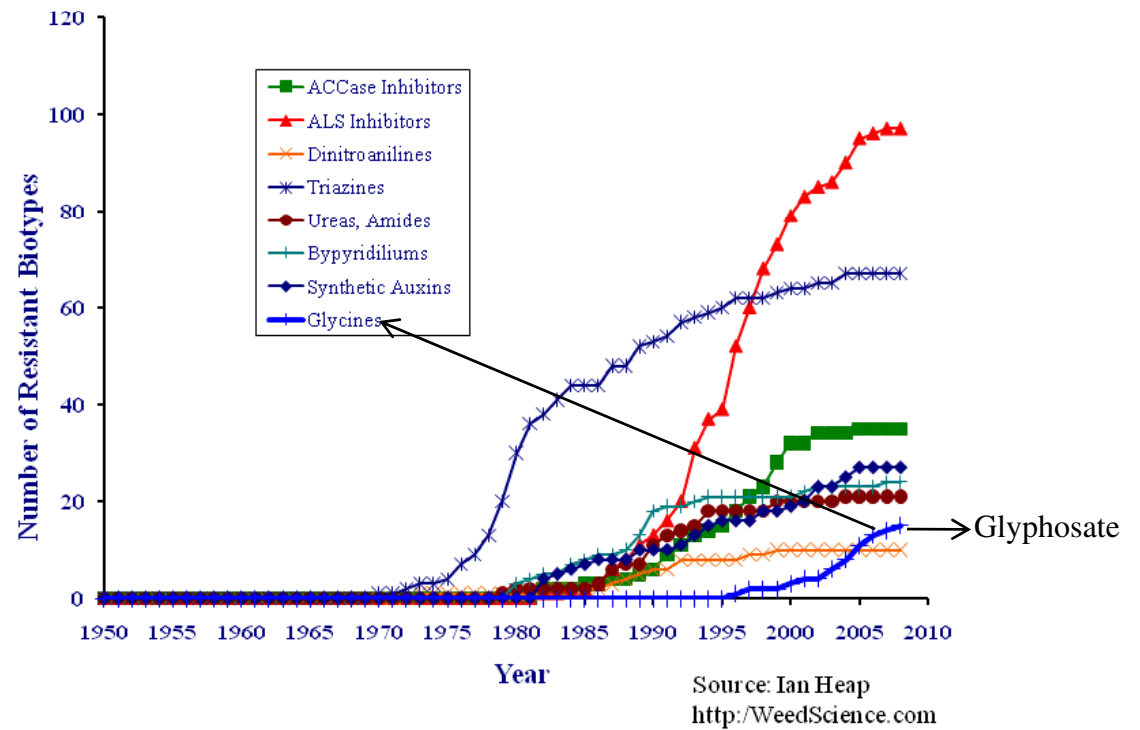


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# Glyphosate-Resistant Weeds

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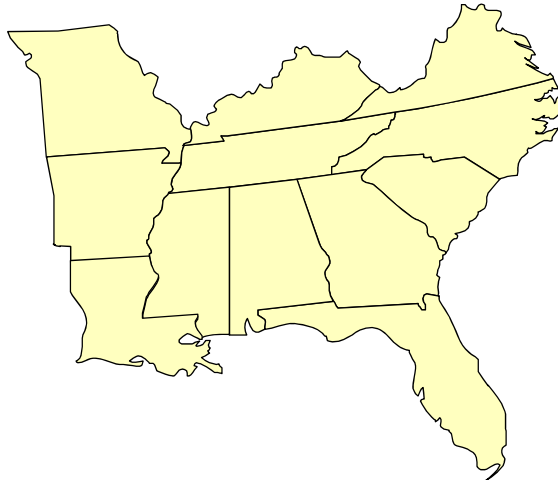
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# Glyphosate-Resistant Weeds

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- United States – 11 weed species

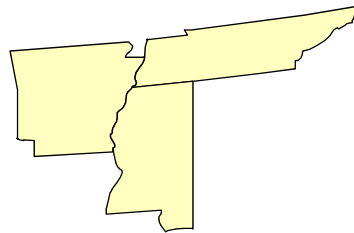
# Glyphosate-Resistant Weeds

- Worldwide – 20 weed species
- United States – 11 weed species
- Southeastern US – 8 weed species  
(AL, AR, FL, GA, KY, LA, MS, MO, NC, SC, TN, VA)



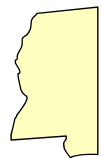
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- Mid-South – 7 weed species  
(AR, TN, MS)



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(AL, AR, FL, GA, KY, LA, MS, MO, NC, SC, TN, VA)
- Mid-South – 7 weed species  
(AR, TN, MS)
- Mississippi – 4 weed species (+3)



# Palmer Amaranth

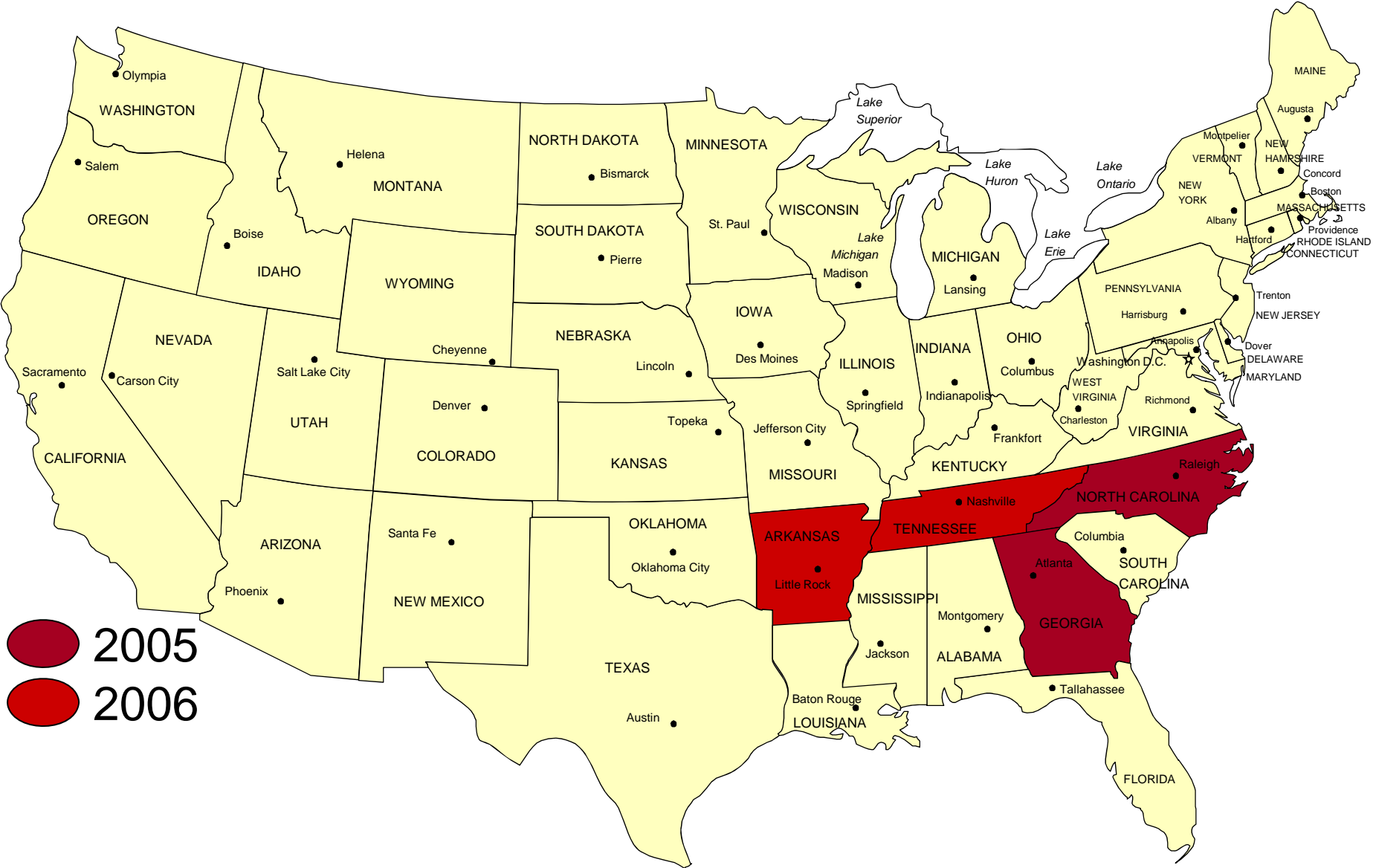


# Glyphosate-Resistant Palmer Amaranth in the Southeastern US





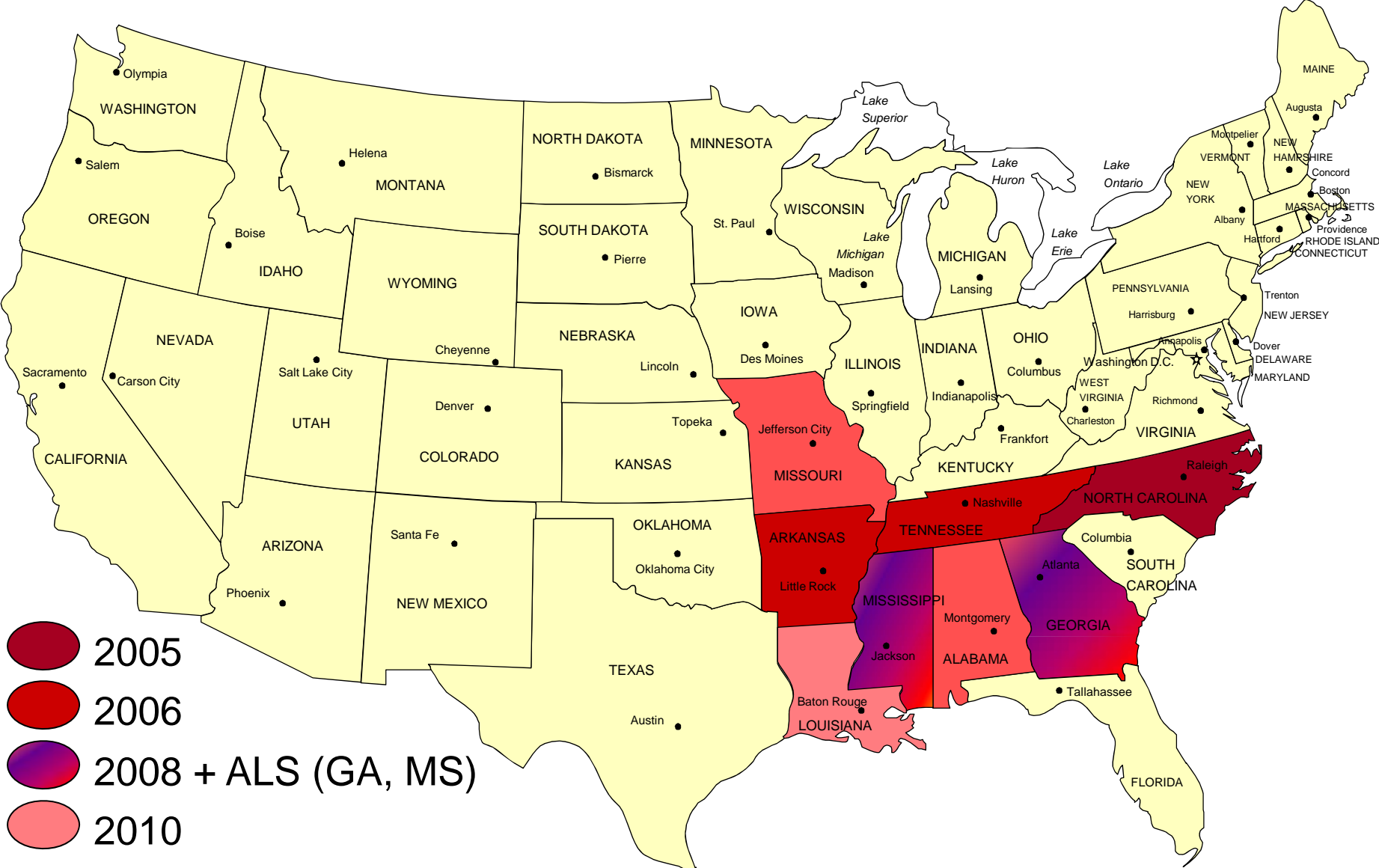
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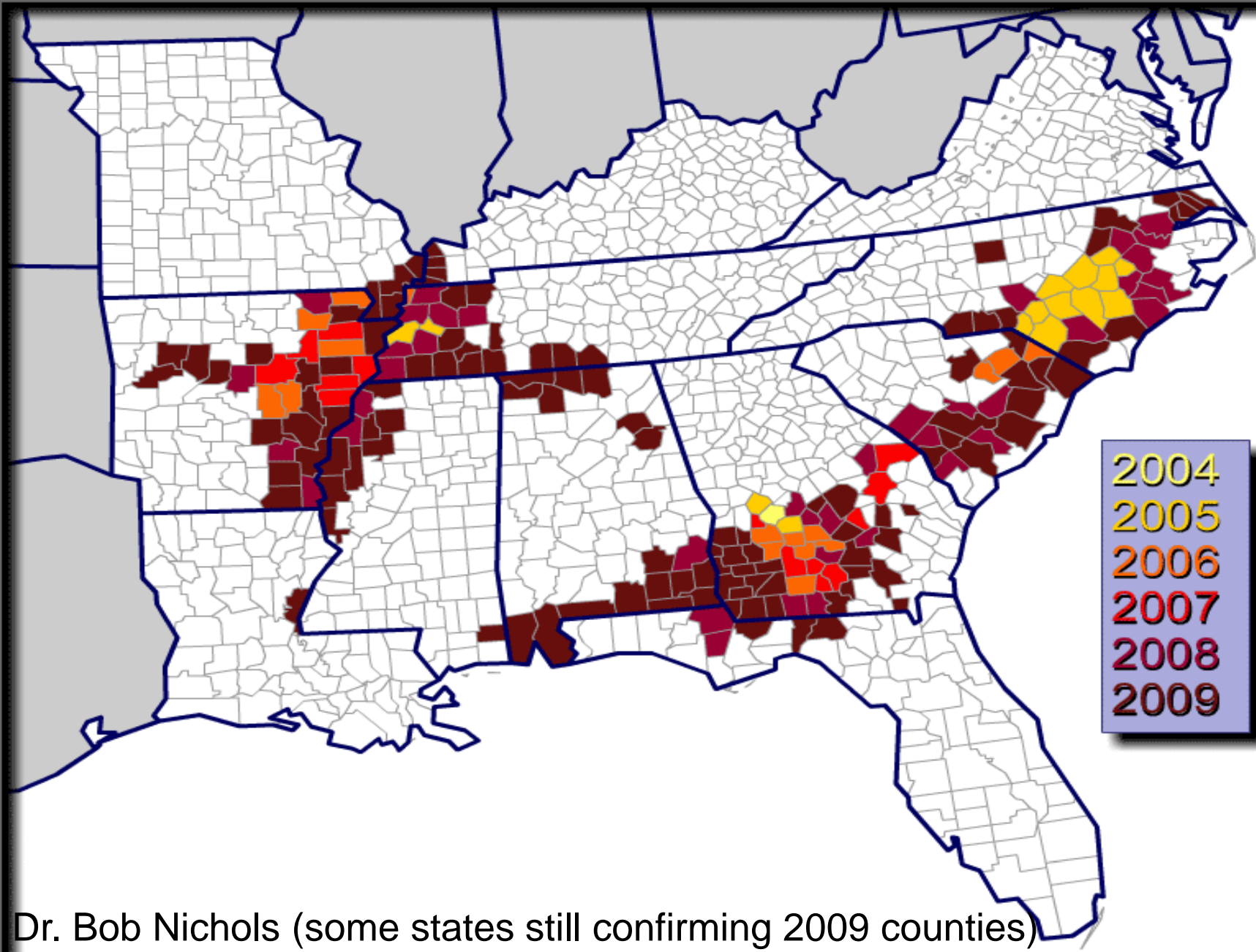






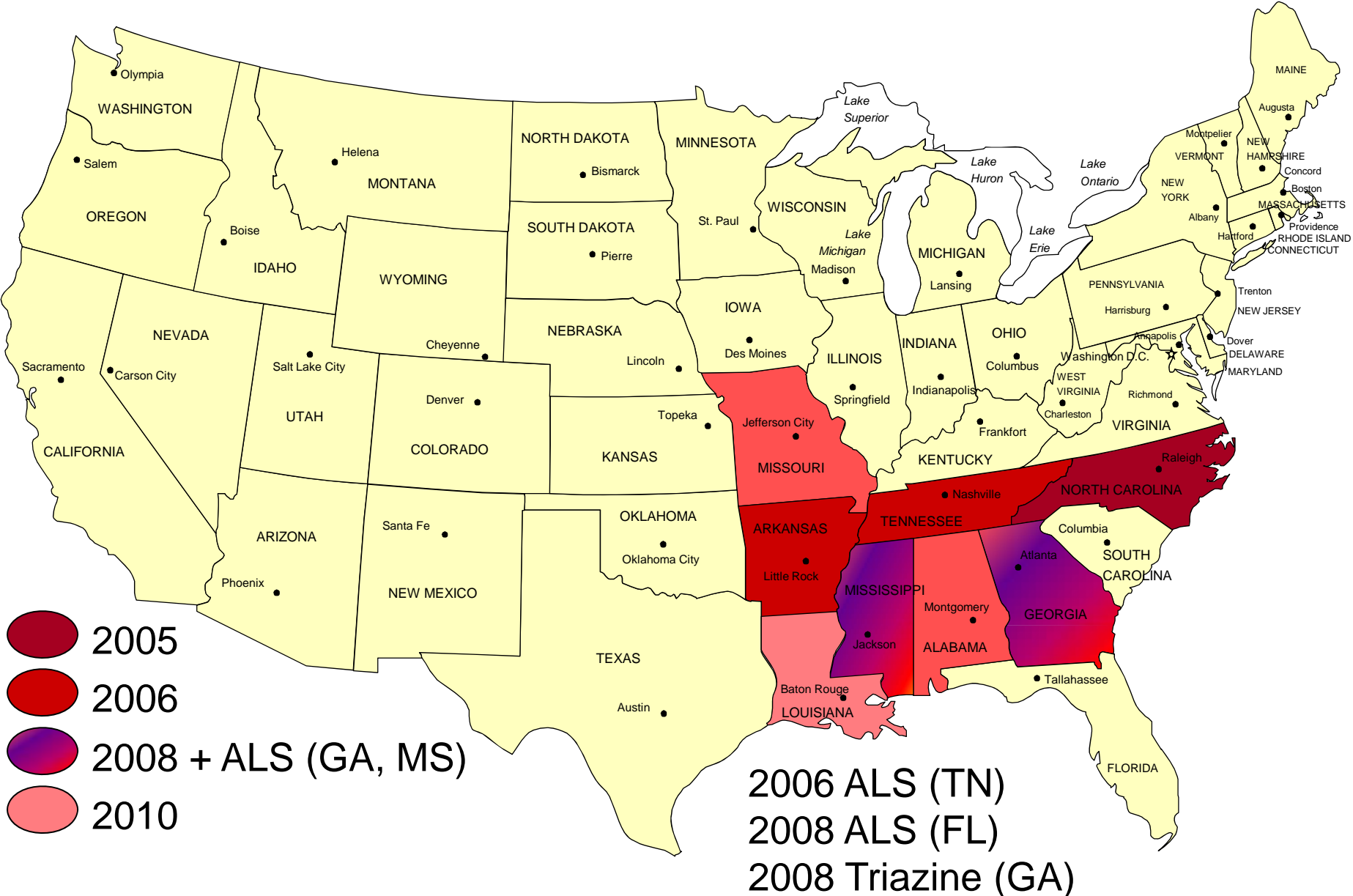
# Glyphosate-Resistant Palmer Amaranth in the Southeastern US





Dr. Bob Nichols (some states still confirming 2009 counties)

# Glyphosate-Resistant Palmer Amaranth in the Southeastern US





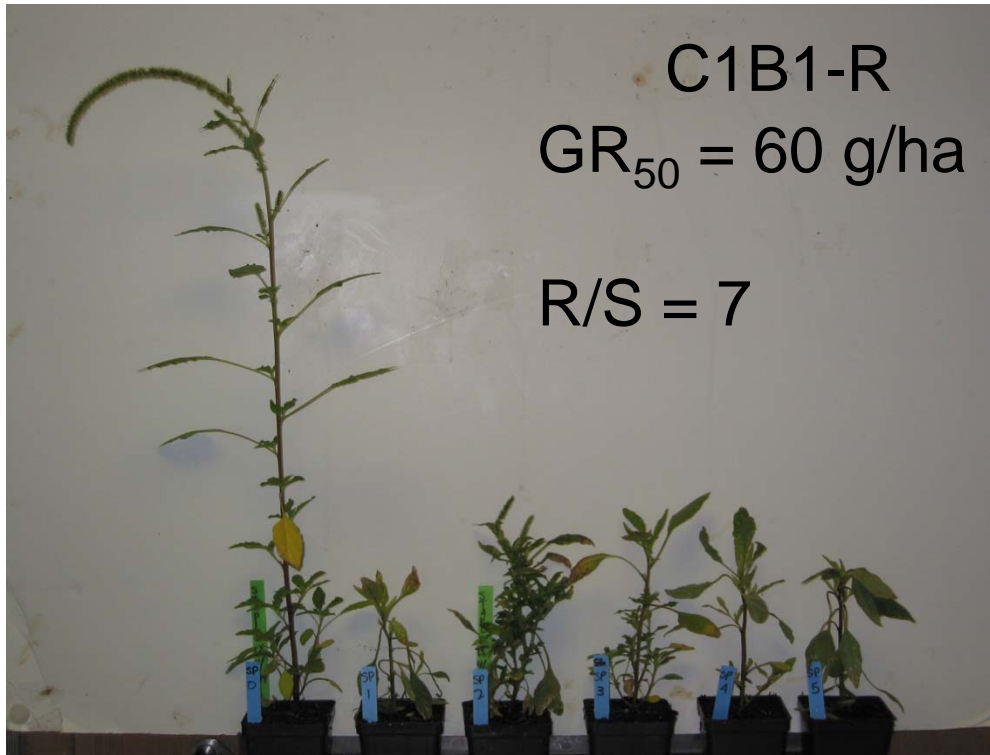


Susceptible



Glyphosate-resistant

Left to Right:  
Glyphosate-  
0.84  
Paraquat-0.56  
Glufosinate-  
0.59  
Fomesafen-  
0.42  
Trifloxysulfuron-  
0.13  
Pyrithiobac-  
0.11  
Chlorimuron-  
0.013  
Cloransulam-  
0.28  
All kg/ha,  
3 WAT

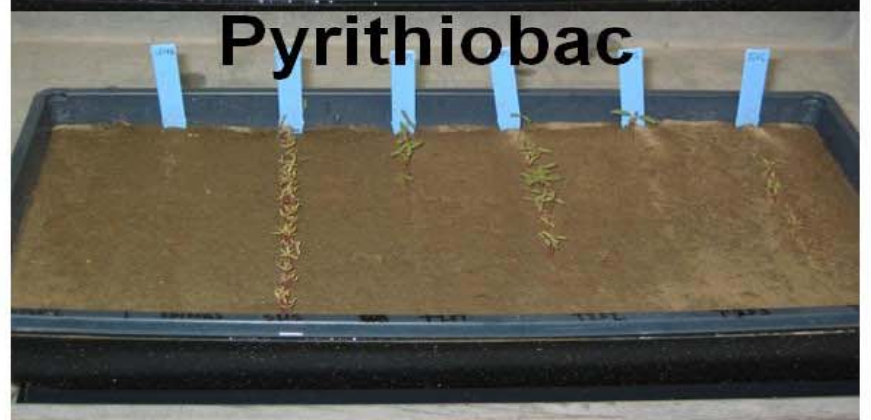


Pyriithiobac (g ai/ha)

0 55 110 220 440 880



Emergence of Palmer  
amaranth seedlings 10 DAT -  
None in S-metolachlor,  
fomesafen, and pendimethalin,  
but some through pyrithiobac





**Nontreated**

**S-metolachlor**



**Nontreated**

**Fomesafen**



**Nontreated**

**Pendimethalin**



**Nontreated**

**Pyrithiobac**



**Nontreated**

**Pyrithiobac**



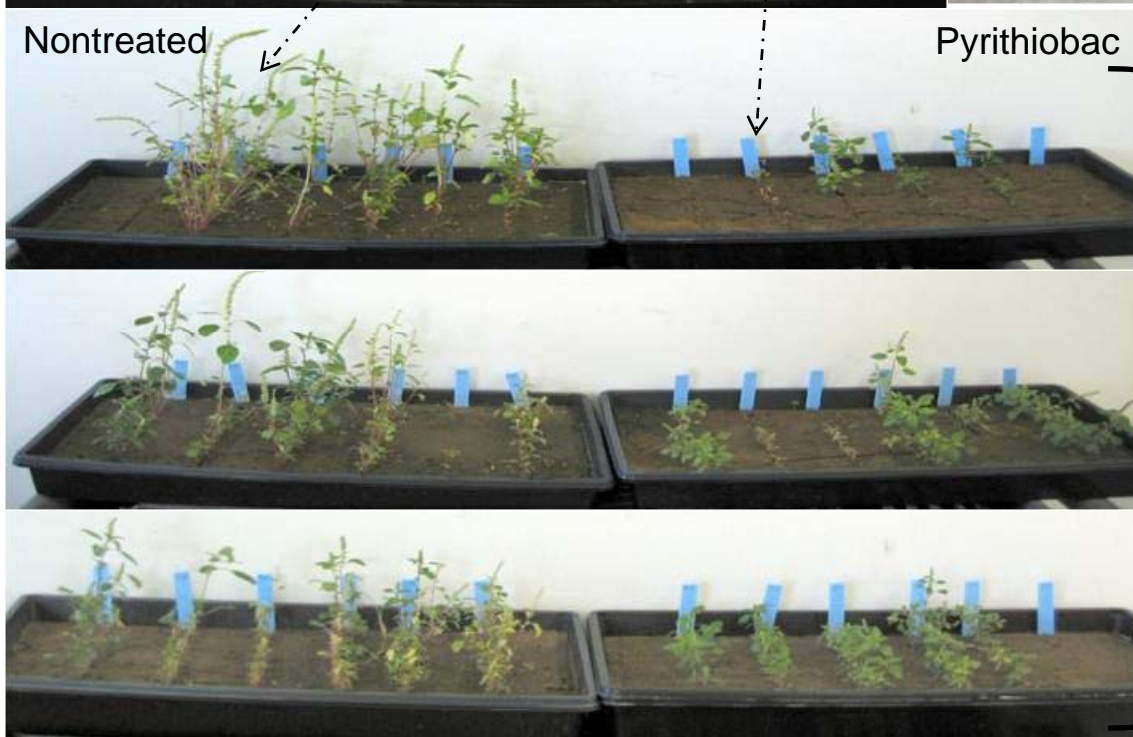
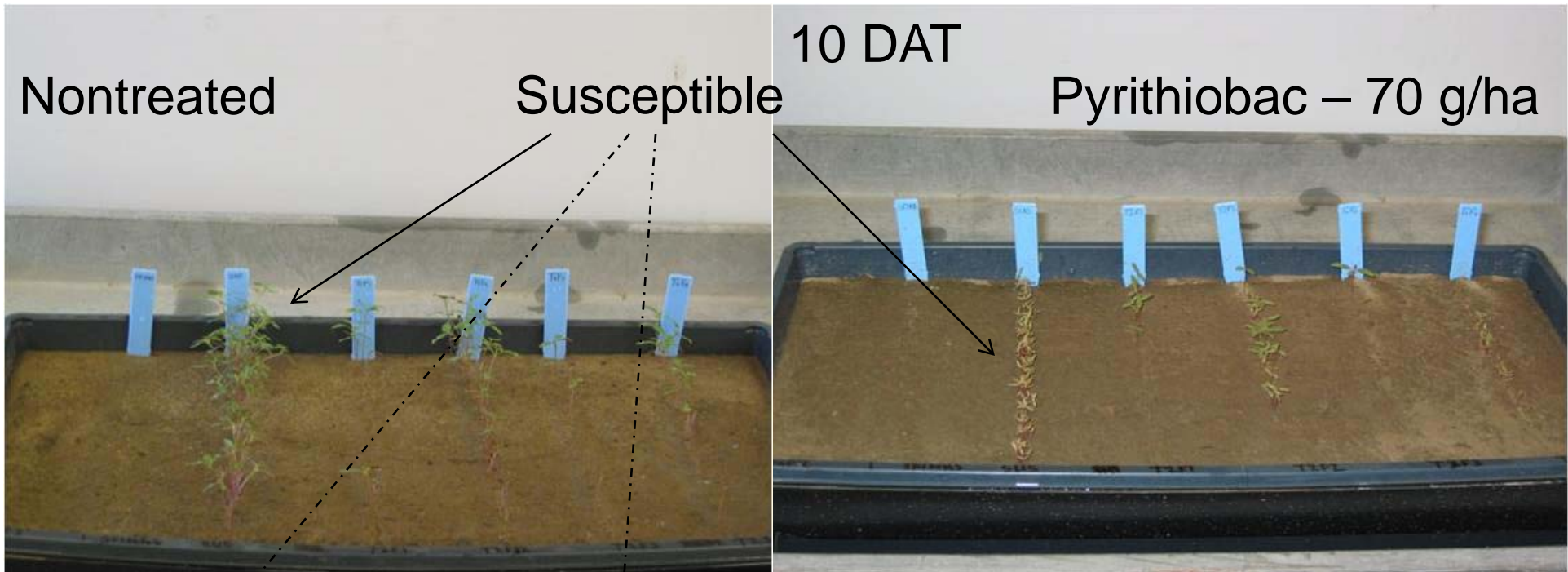
**Nontreated**

**Pyrithiobac**

Emergence of  
Palmer amaranth  
seedlings 4 WAT -  
None in S-  
metolachlor,  
fomesafen, and  
pendimethalin, but  
some biotypes  
survived pyrithiobac

A few other  
biotypes that  
survived  
pyrithiobac 4 WAT





4 WAT – Several  
biotypes survived  
pyriithiobac  
applied PRE



# Waterhemp

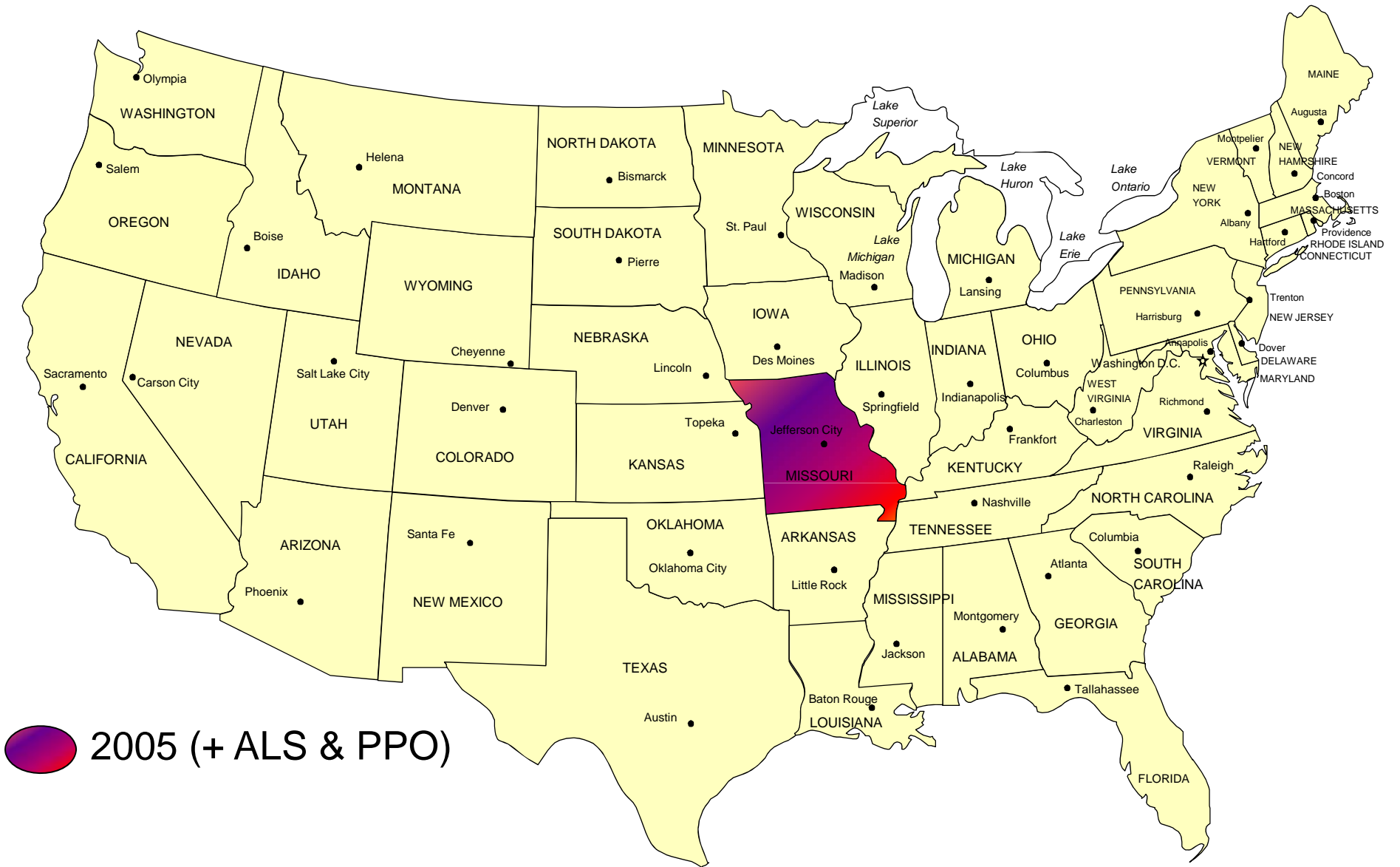
[http://twig.tamu.edu/Waterhemp\\_amaranthus\\_tuberculatus\\_01.jpg](http://twig.tamu.edu/Waterhemp_amaranthus_tuberculatus_01.jpg)



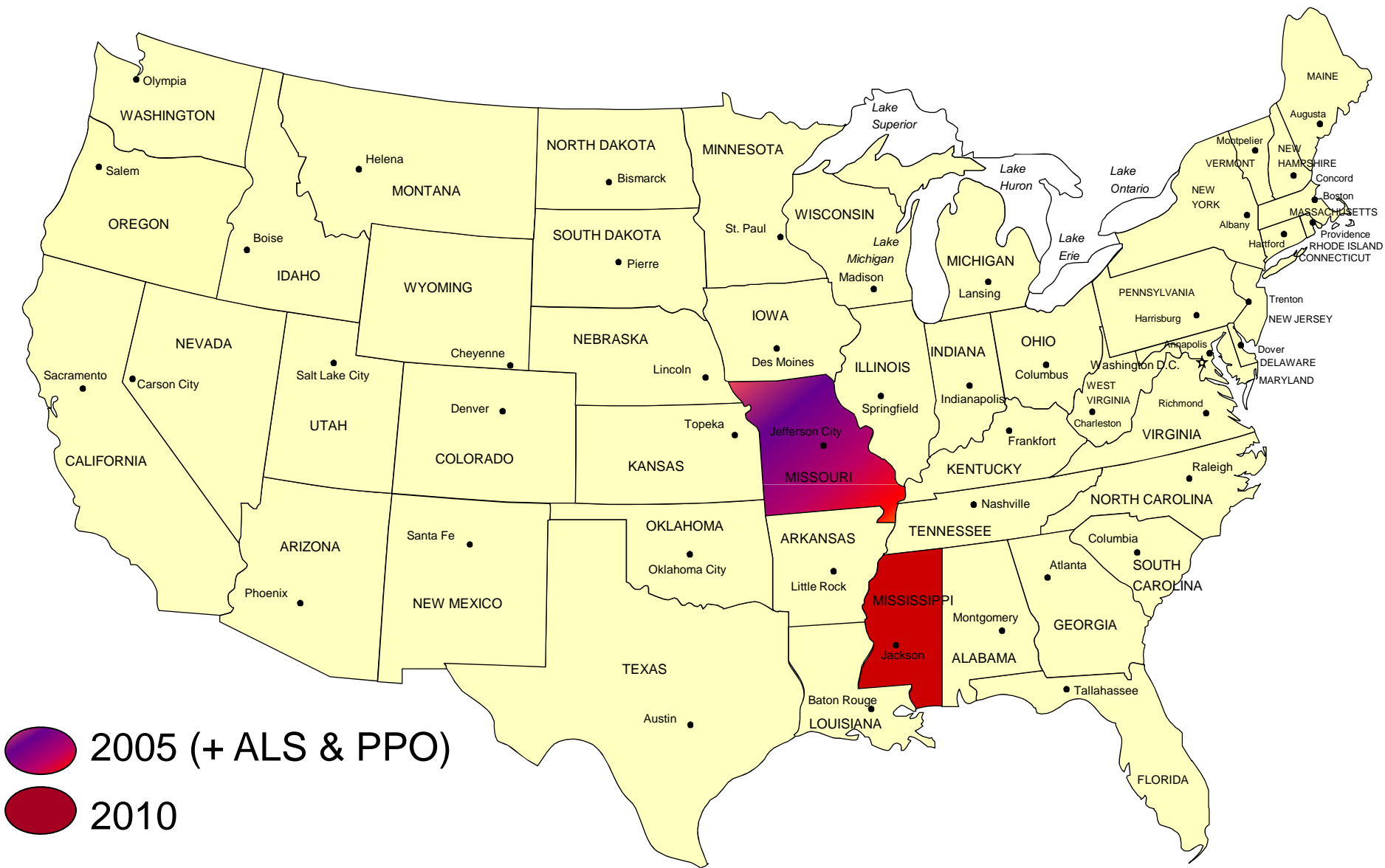
# Glyphosate-Resistant Waterhemp in the Southeastern US



# Glyphosate-Resistant Waterhemp in the Southeastern US



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# Waterhemp

Waterhemp16-Resistant

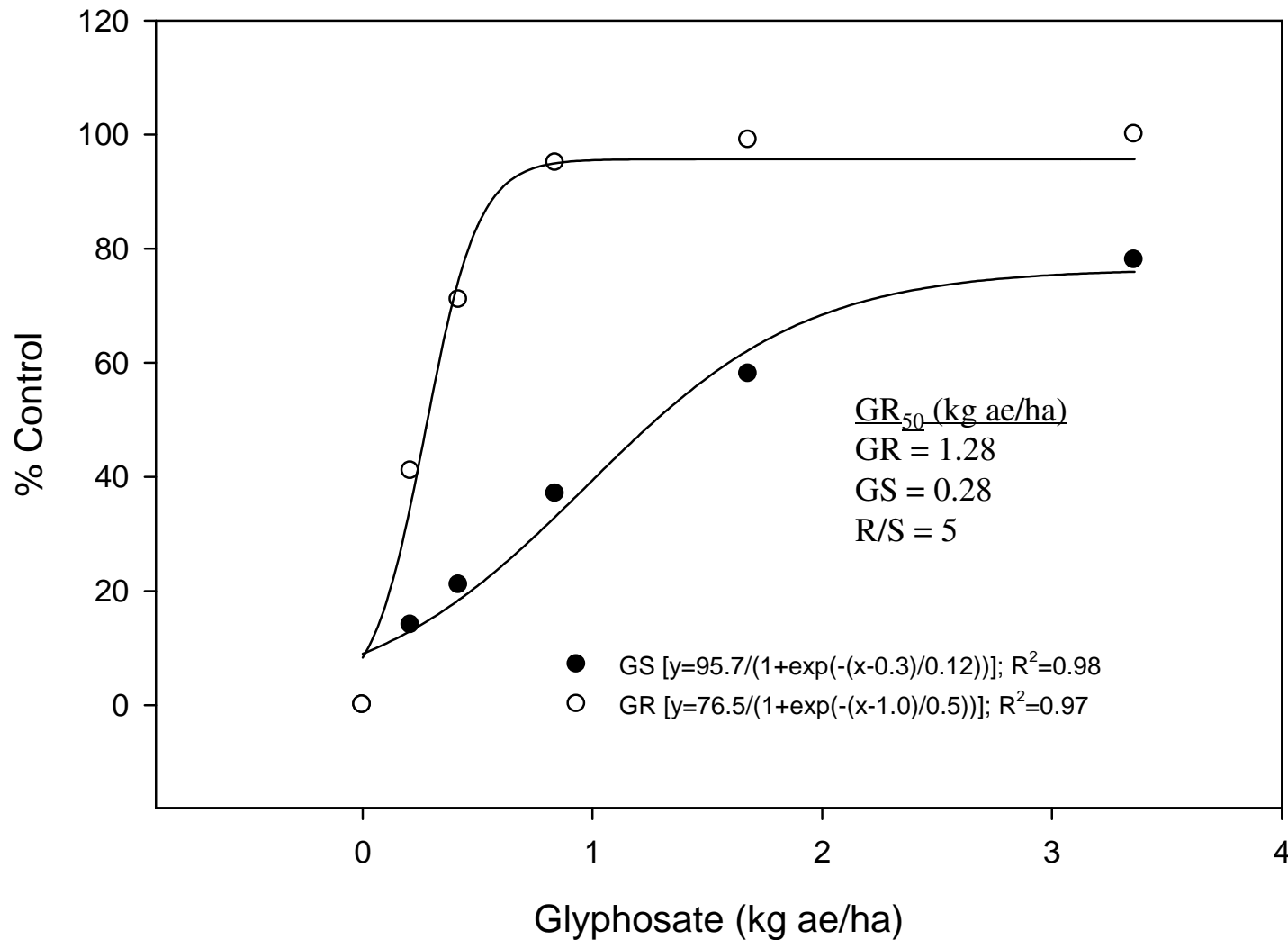
MO Waterhemp-Susceptible



Glyphosate (kg ae/ha) – L to R: 0, 0.21, 0.42, 0.84, 1.68, 3.36



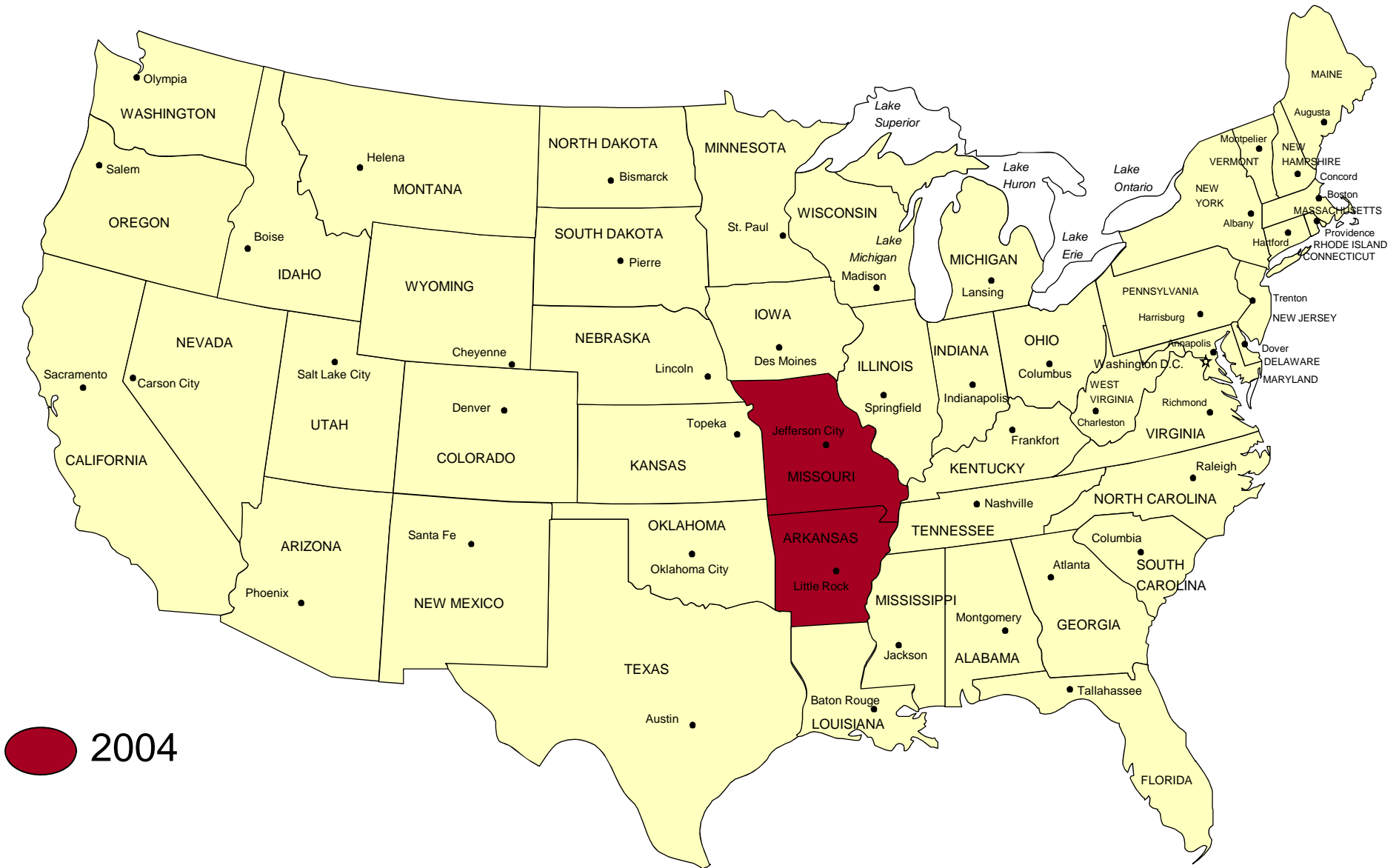
# Glyphosate-Resistant Waterhemp



# Common Ragweed



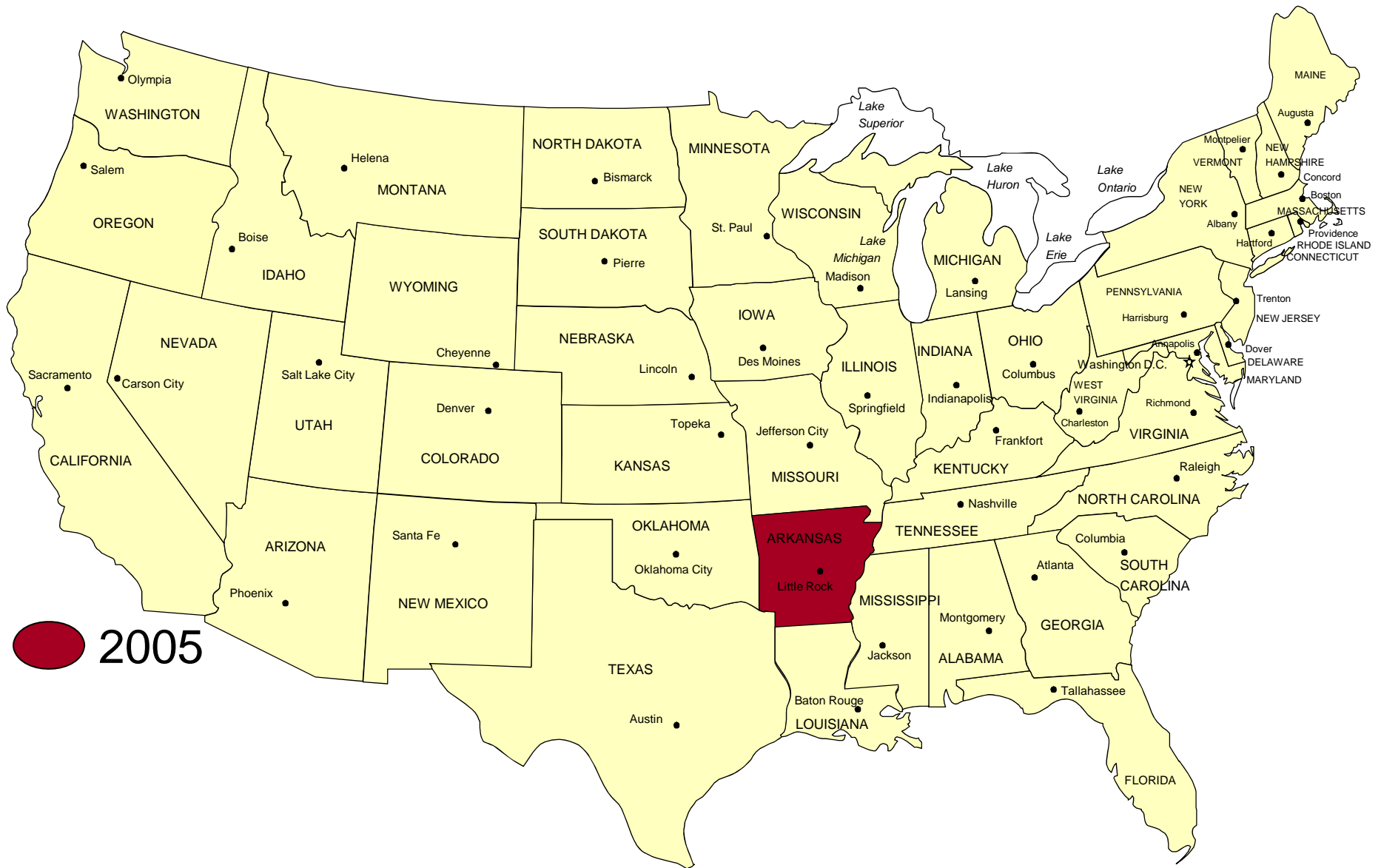
# Glyphosate-Resistant Common Ragweed in the Southeastern US



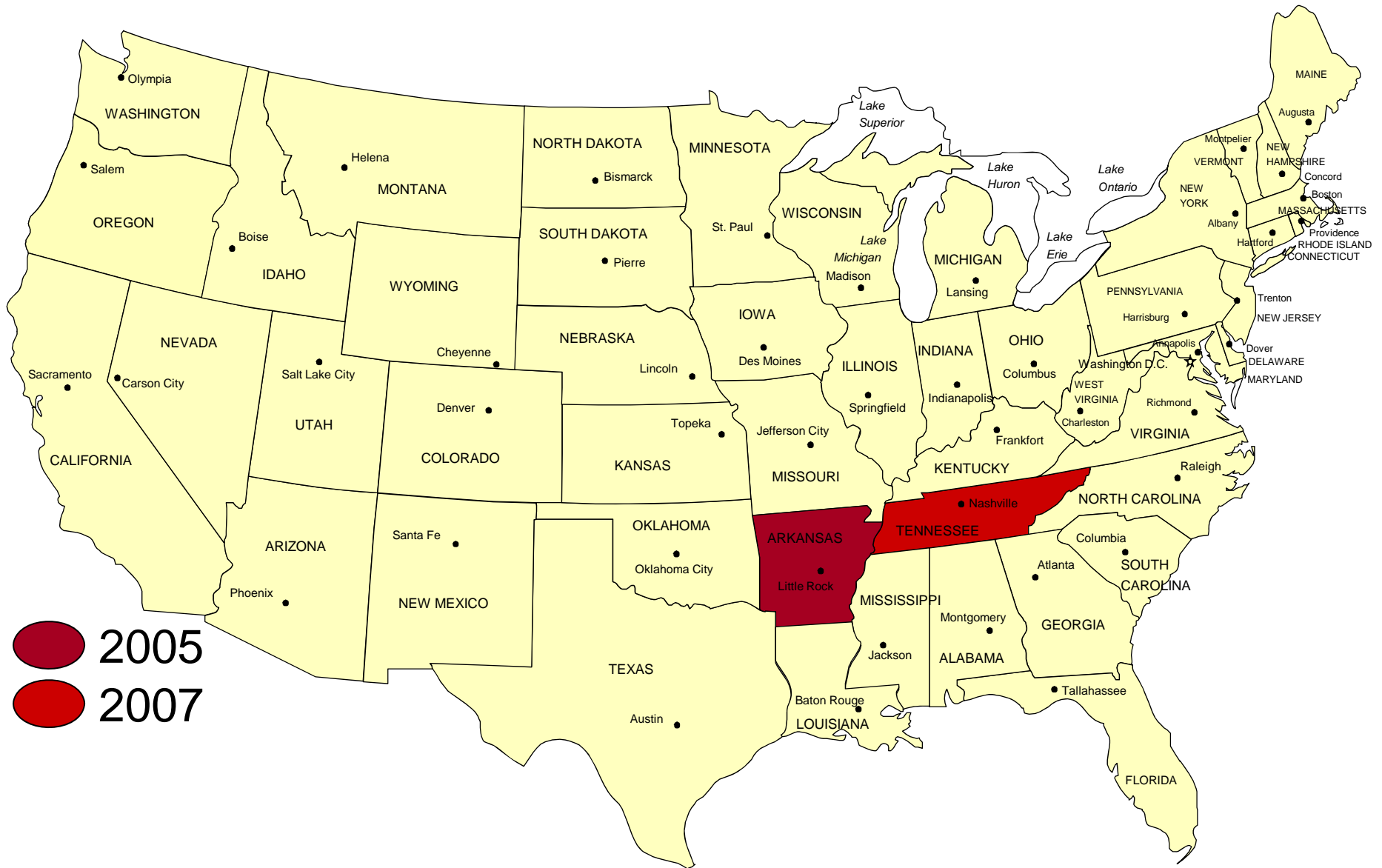
# Giant Ragweed



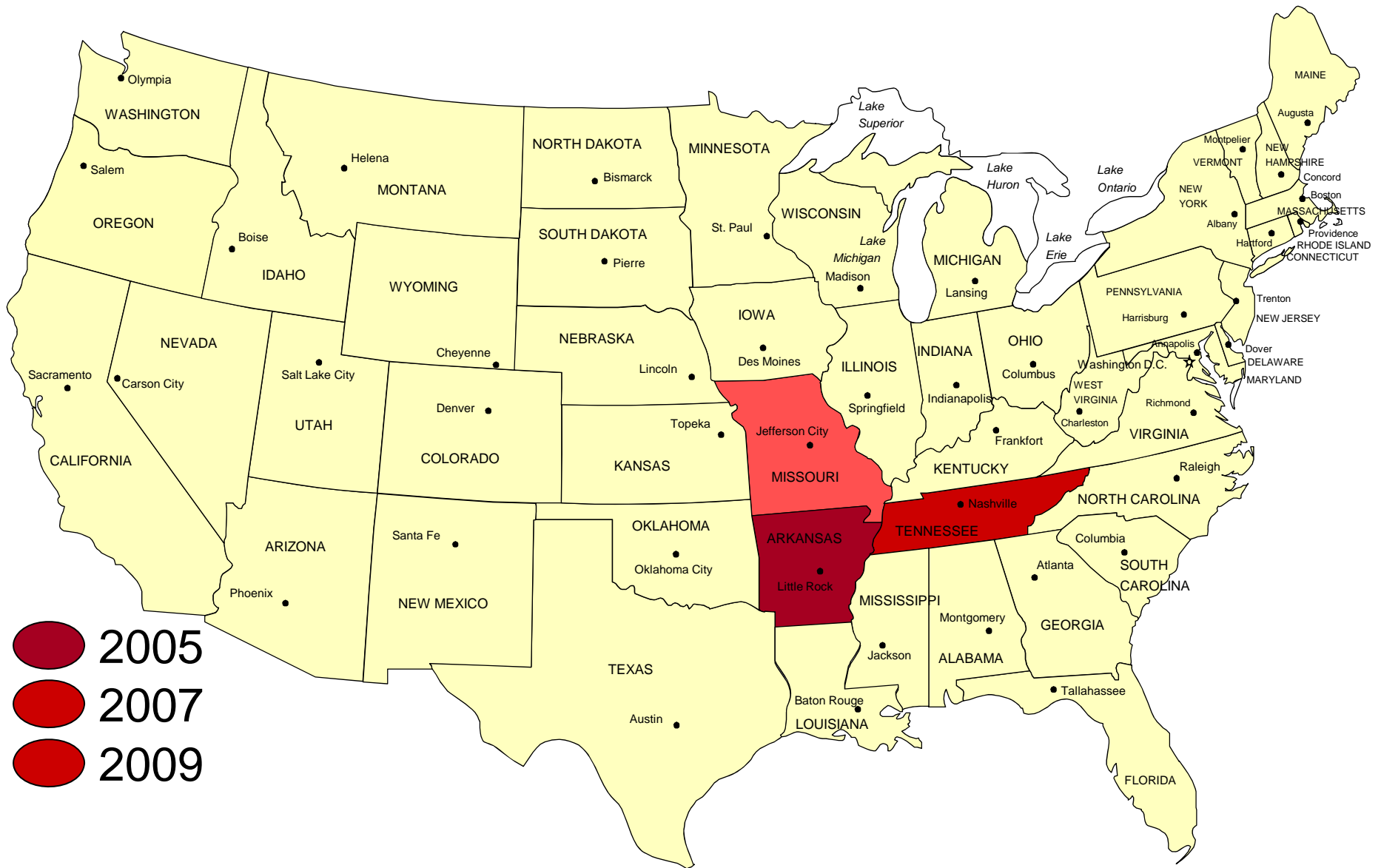
# Glyphosate-Resistant Giant Ragweed in the Southeastern US



# Glyphosate-Resistant Giant Ragweed in the Southeastern US



# Glyphosate-Resistant Giant Ragweed in the Southeastern US





# Horseweed



Tom Eubank

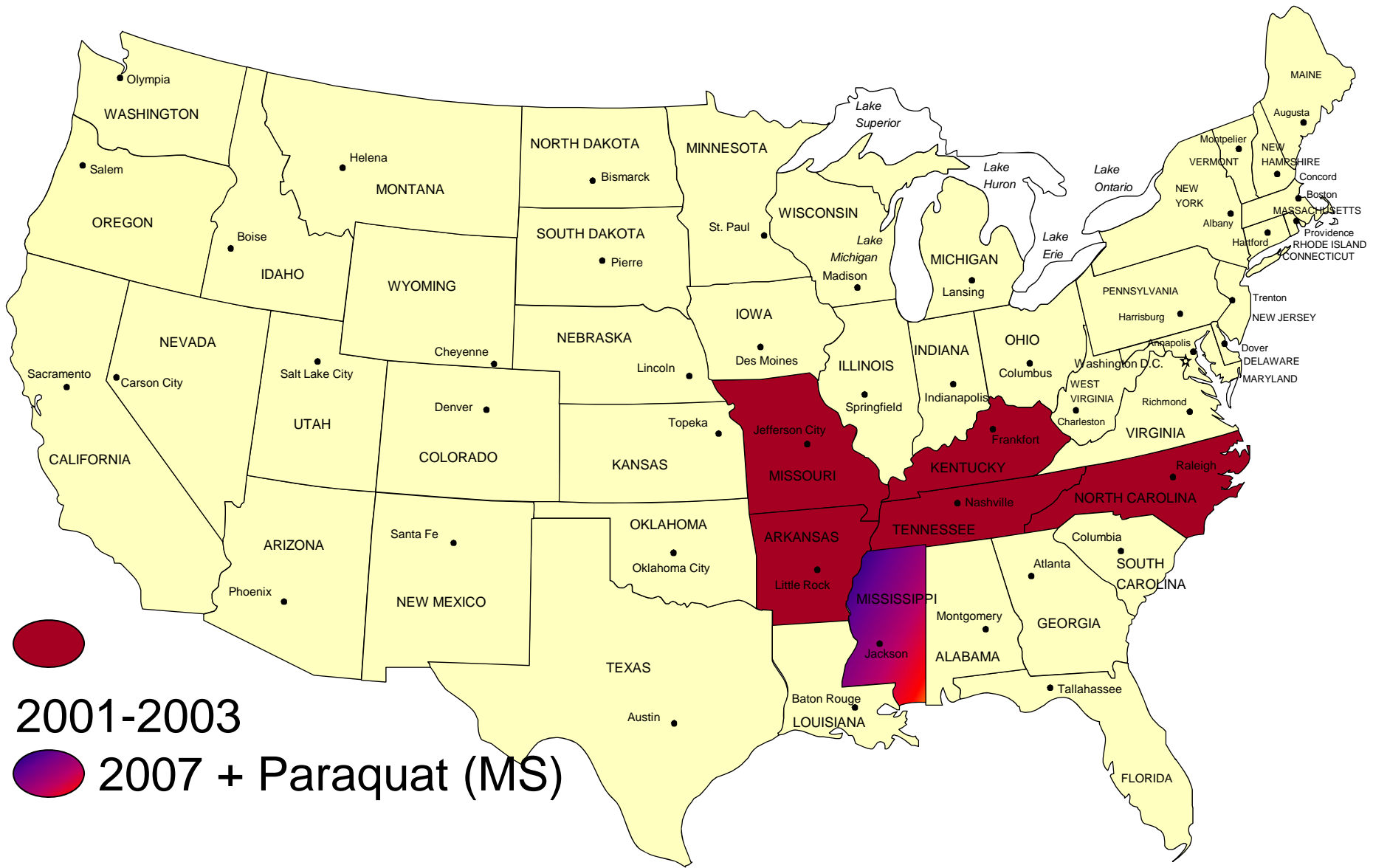


# Glyphosate-Resistant Horseweed in the Southeastern US



2001-2003

# Glyphosate-Resistant Horseweed in the Southeastern US



# Italian Ryegrass





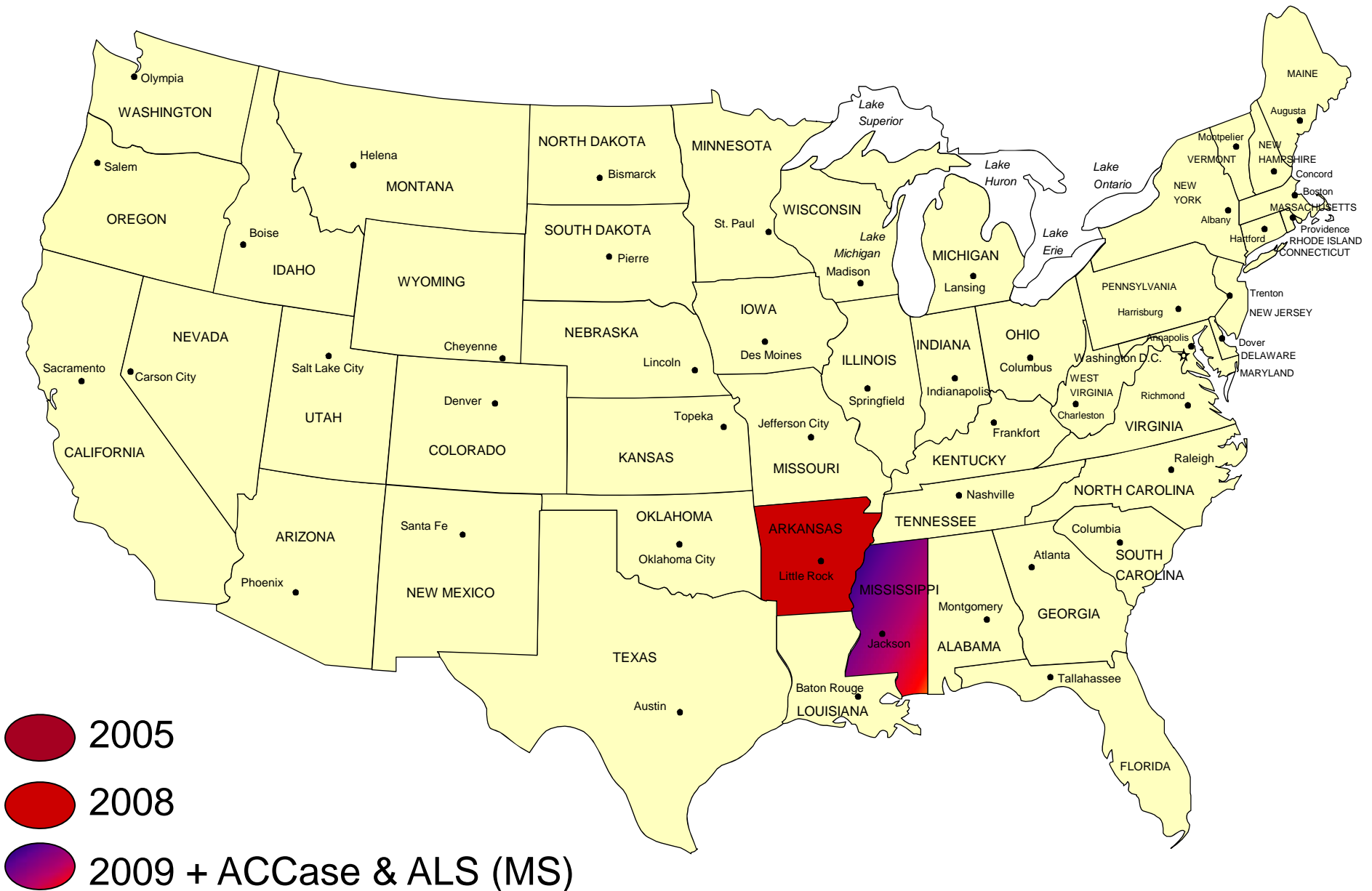
# Glyphosate-Resistant Italian Ryegrass in the Southeastern US



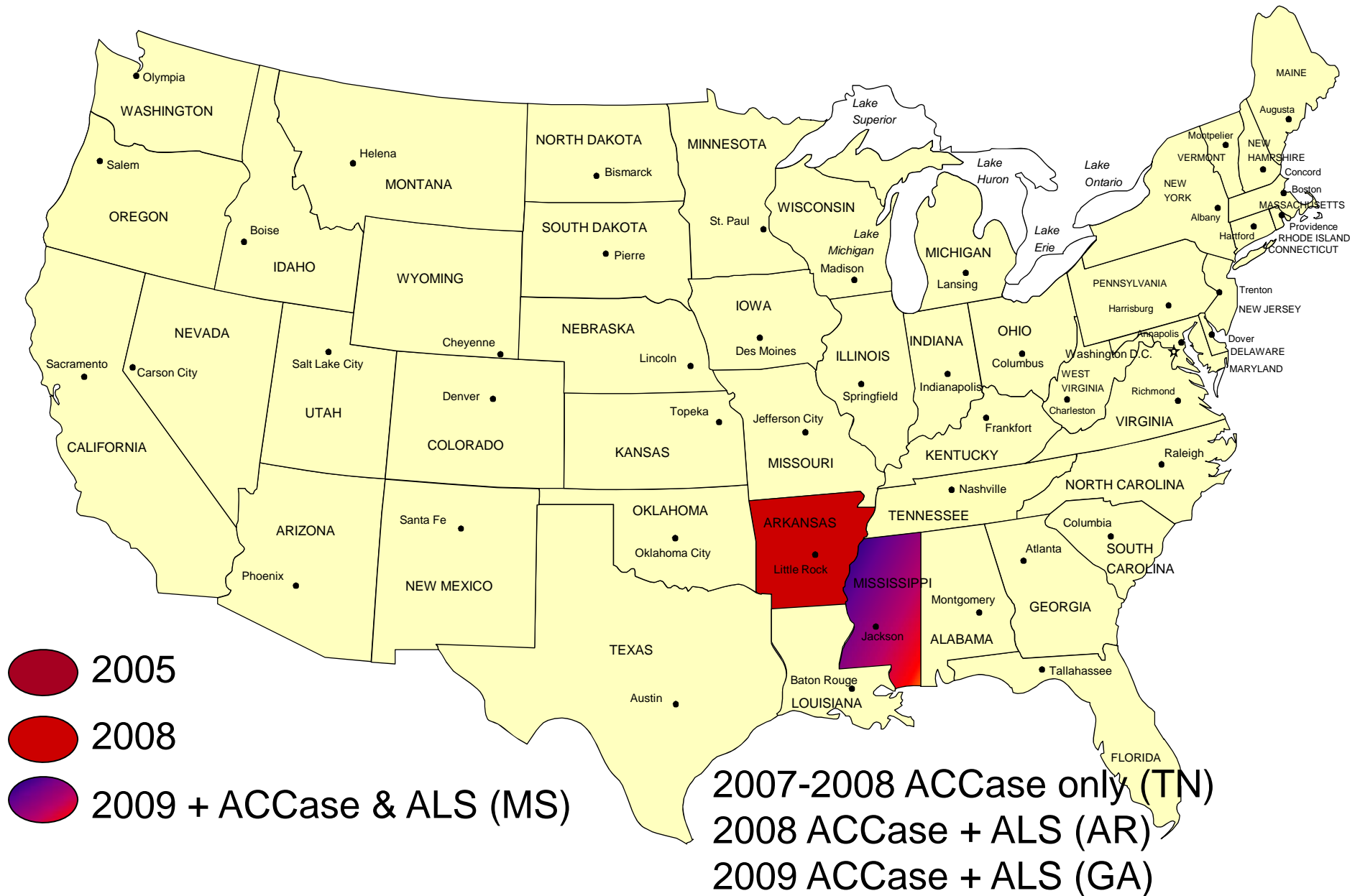
# Glyphosate-Resistant Italian Ryegrass in the Southeastern US



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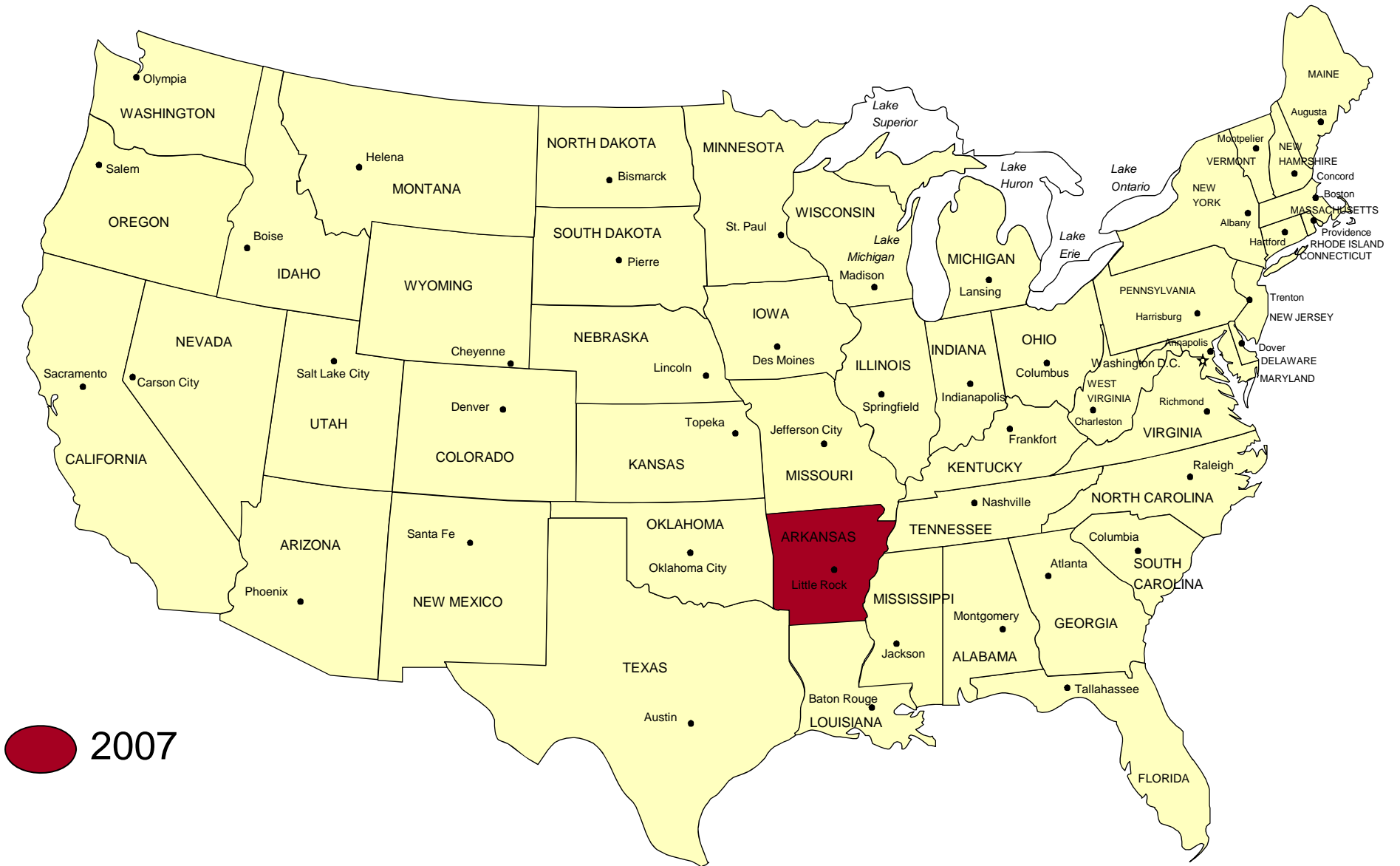
# Johnsongrass



[http://www.co.sumner.ks.us/Portals/ks-sumner/Noxious%20Weeds/Johnsongrass\\_3D.jpg](http://www.co.sumner.ks.us/Portals/ks-sumner/Noxious%20Weeds/Johnsongrass_3D.jpg)



# Glyphosate-Resistant Johnsongrass in the Southeastern US



● 2007

# Glyphosate-Resistant Johnsongrass in the Southeastern US



2007

2008 (pending confirmation of heritability)

# Non-Glyphosate Resistant Weeds

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- Barnyardgrass/Junglerice



[www.agf.gov.bc.ca](http://www.agf.gov.bc.ca)

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Arkansas: Command/ALS/Propanil/Facet



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- Rice Flatsedge



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Arkansas: ALS



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[www.agf.gov.bc.ca](http://www.agf.gov.bc.ca)

- Rice Flatsedge

Arkansas: ALS

Mississippi: ALS



[www.ppws.vt.edu](http://www.ppws.vt.edu)

- Amazon Sprangletop



[www.lsuagcenter.com](http://www.lsuagcenter.com)

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[www.agf.gov.bc.ca](http://www.agf.gov.bc.ca)

- Rice Flatsedge

Arkansas: ALS

Mississippi: ALS



[www.ppws.vt.edu](http://www.ppws.vt.edu)

- Amazon Sprangletop

Arkansas: ACCase



[www.lsuagcenter.com](http://www.lsuagcenter.com)



# Summary – Recent Resistance Cases in Mississippi, Mid-South, & Southeastern US

Palmer Amaranth	Glyphosate	AL, <b>AR</b> , FL, GA (+ALS), KY, LA, <b>MS (+ ALS)</b> , MO, NC, SC, <b>TN</b>
	ALS	FL, <b>TN</b>
	Triazine	GA
Waterhemp	Glyphosate	MO, <b>MS</b>
	ALS	<b>TN</b>
Common Ragweed	Glyphosate	<b>AR</b> , MO
Giant Ragweed	Glyphosate	<b>AR</b> , MO, <b>TN</b>
Horseweed	Glyphosate	<b>AR</b> , KY, <b>MS</b> , MO, NC, <b>TN</b>
Italian ryegrass	Glyphosate	<b>AR</b> , <b>MS (+ACCCase &amp; ALS)</b>
	ACCCase	<b>AR (+ALS)</b> , GA (+ALS)
Johnsongrass	Glyphosate	<b>AR</b> , <b>MS (pending heritability tests)</b>
Barnyardgrass } (Junglerice)	Propanil/Facet	<b>AR (also Command)</b> , <b>MS</b> , <b>LA</b>
	ALS	<b>AR</b> , <b>MS</b>
Rice Flatsedge	ALS	<b>AR</b> , <b>MS</b>
Amazon Sprangletop	ACCCase	<b>AR</b>

# ACKNOWLEDGMENTS



- Faculty/Scientists, staff, student workers of DREC, MAFES, USDA-ARS, and MSU Dept. of Plant & Soil Sciences
- Industry, growers, crop consultants

# Thank you

???????

Vijay Nandula  
Delta Research and Extension Center  
P.O. Box 197, 82 Stoneville Road  
Stoneville, MS 38776

Telephone: 662-686-3271

Mobile: 662-347-6752

E-mail: [vnandula@drec.msstate.edu](mailto:vnandula@drec.msstate.edu)