

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

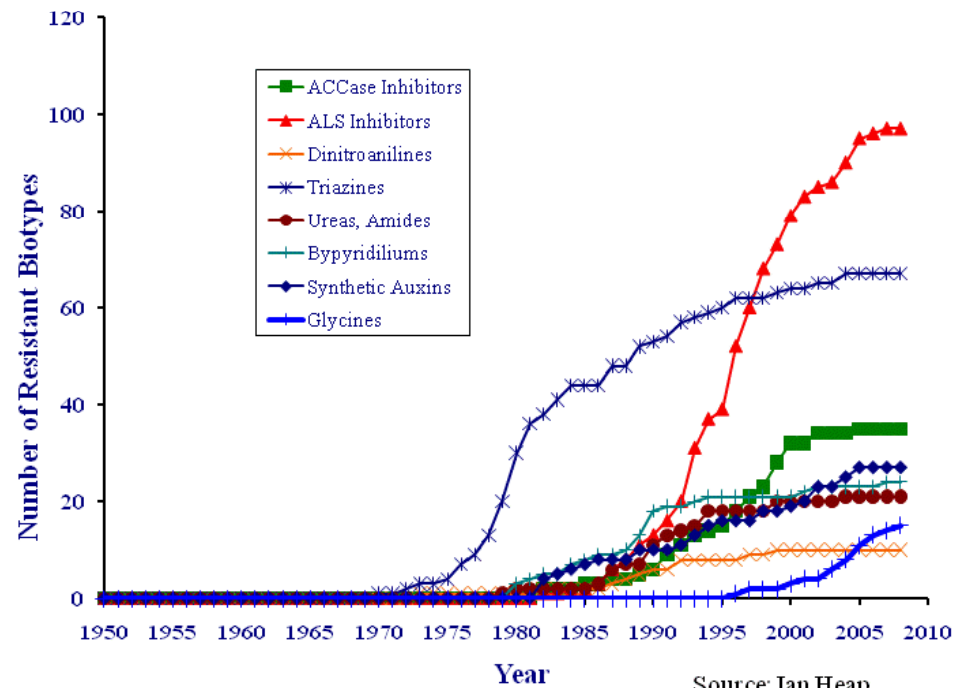
Vijay K. Nandula

Delta Research and Extension Center
Mississippi State University

November 10, 2010

Herbicide Resistance Worldwide

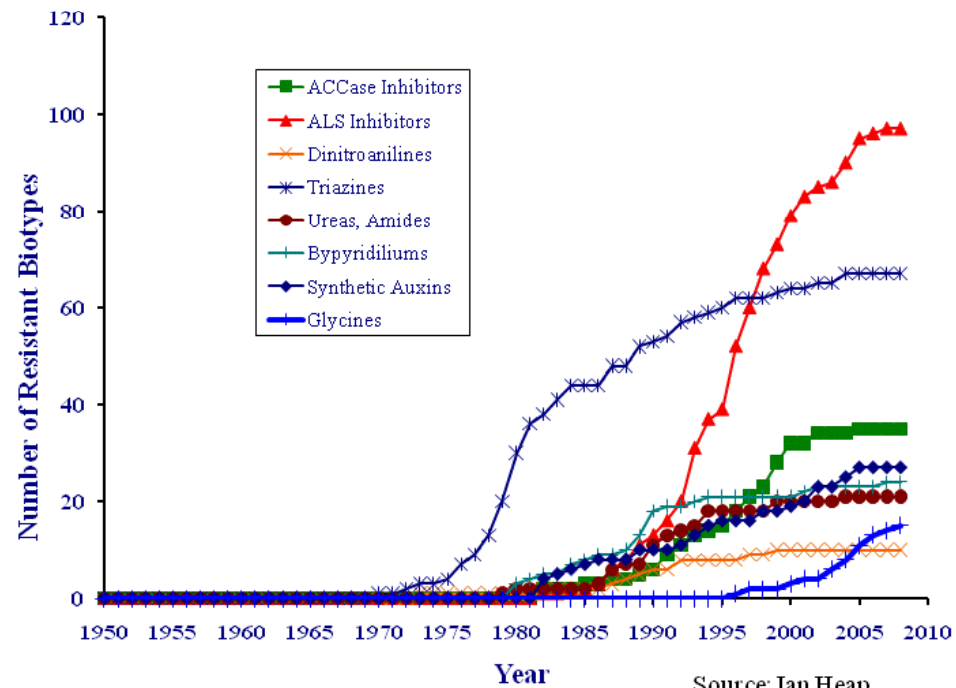
Herbicide Resistance Worldwide



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

Herbicide Resistance Worldwide

as of November 2, 2010

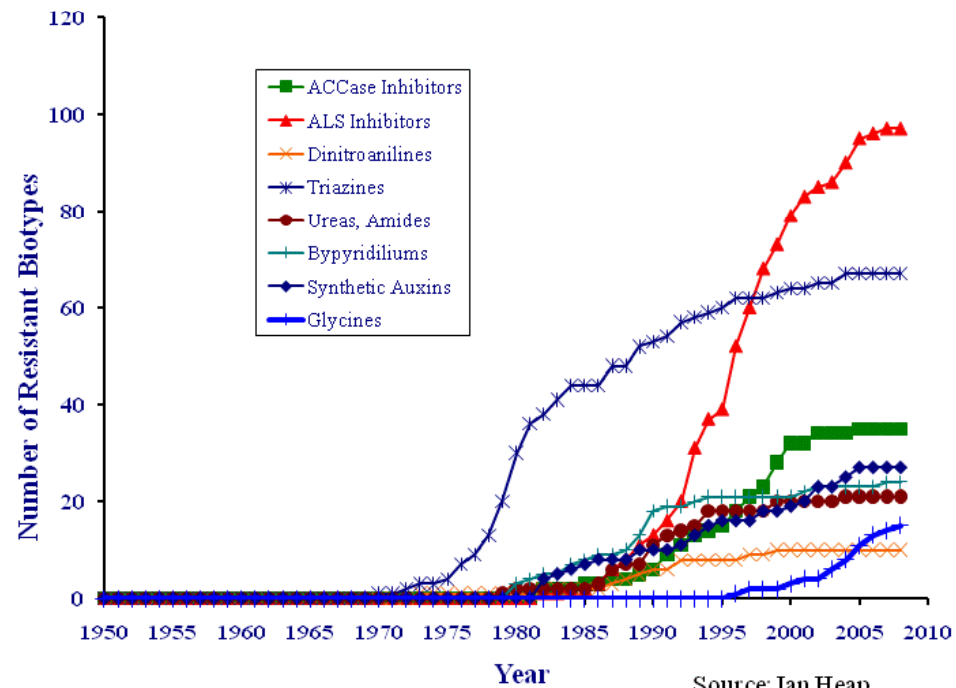


Source: Ian Heap
<http://WeedScience.com>

Herbicide Resistance Worldwide

- 348 Resistant Biotypes

as of November 2, 2010

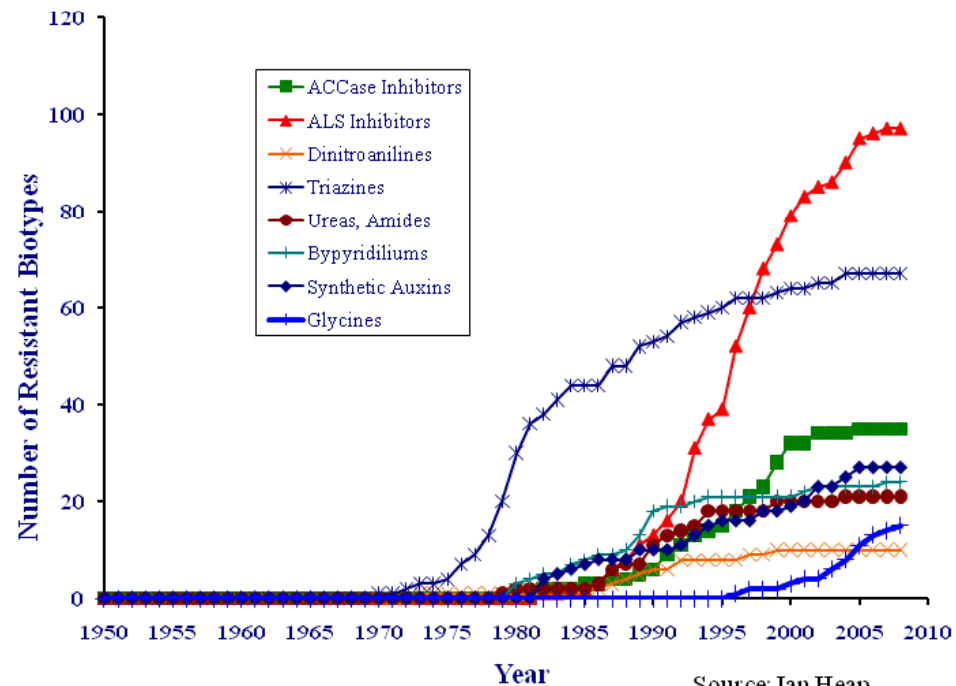


Source: Ian Heap
<http://WeedScience.com>

Herbicide Resistance Worldwide

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

as of November 2, 2010

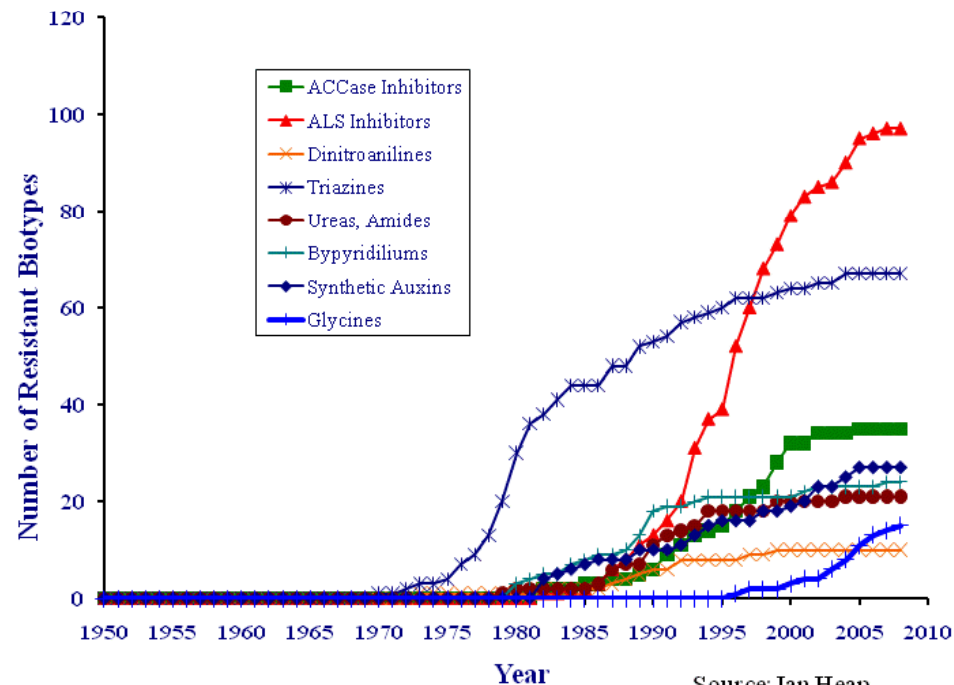


Source: Ian Heap
<http://WeedScience.com>

Herbicide Resistance Worldwide

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

as of November 2, 2010

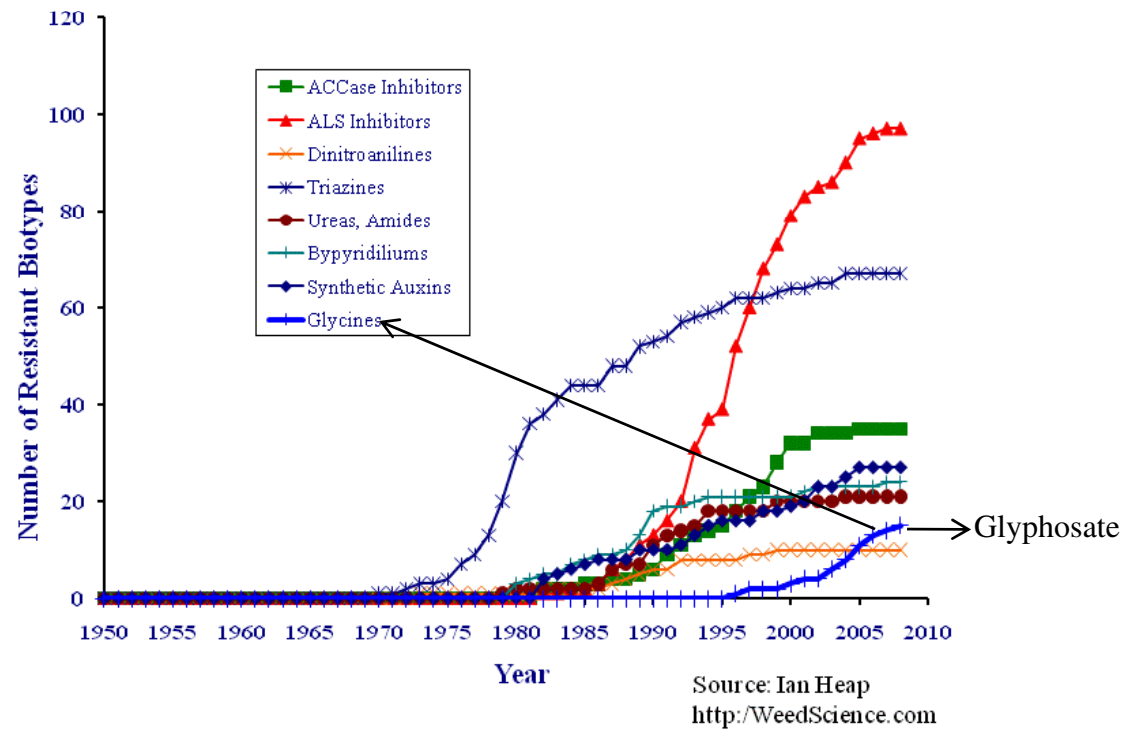


Source: Ian Heap
<http://WeedScience.com>

Herbicide Resistance Worldwide

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

as of November 2, 2010



Glyphosate-Resistant Weeds

Glyphosate-Resistant Weeds

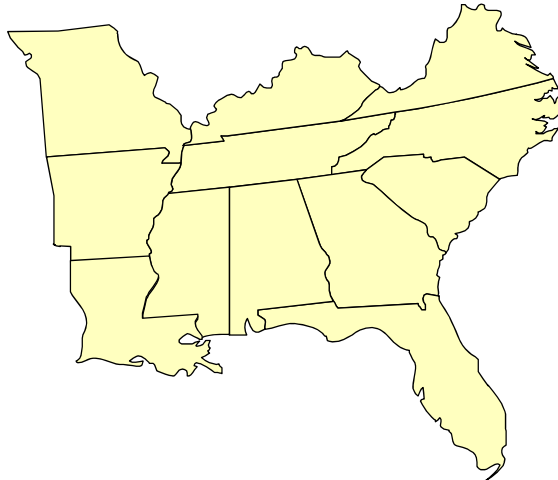
- Worldwide – 20 weed species

Glyphosate-Resistant Weeds

- Worldwide – 20 weed species
- United States – 11 weed species

Glyphosate-Resistant Weeds

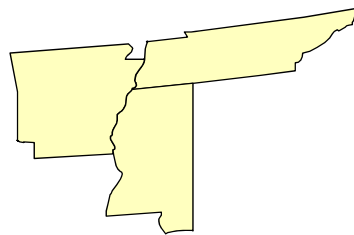
- Worldwide – 20 weed species
- United States – 11 weed species
- Southeastern US – 8 weed species
(AL, AR, FL, GA, KY, LA, MS, MO, NC, SC, TN, VA)



Glyphosate-Resistant Weeds

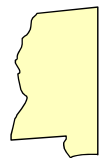
- Worldwide – 20 weed species
- United States – 11 weed species
- Southeastern US – 8 weed species
(AL, AR, FL, GA, KY, LA, MS, MO, NC, SC, TN, VA)
- Mid-South – 7 weed species

(AR, TN, MS)



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)
- Mid-South – 7 weed species
(AR, TN, MS)
- Mississippi – 4 weed species (+3)



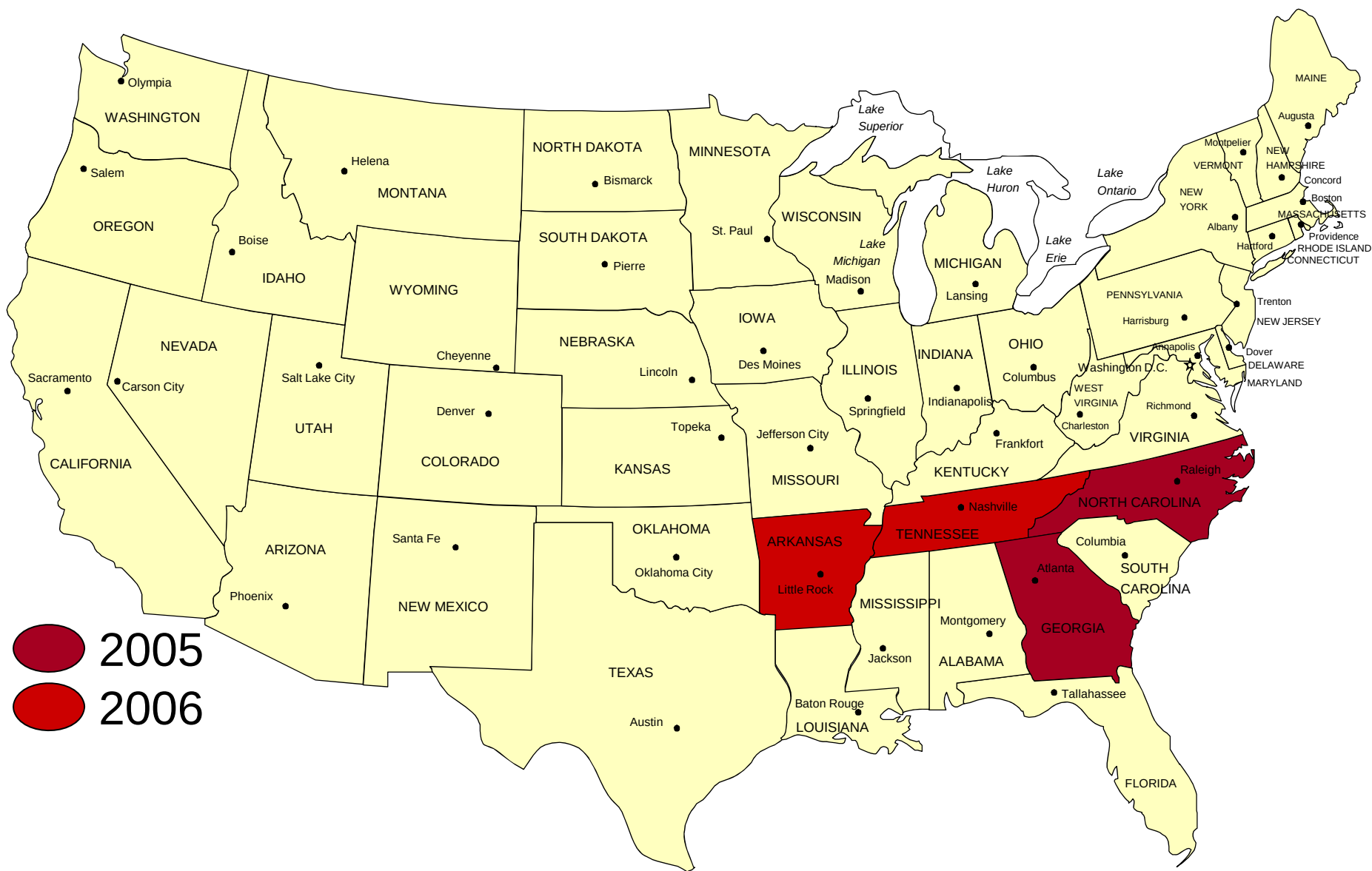
Palmer Amaranth



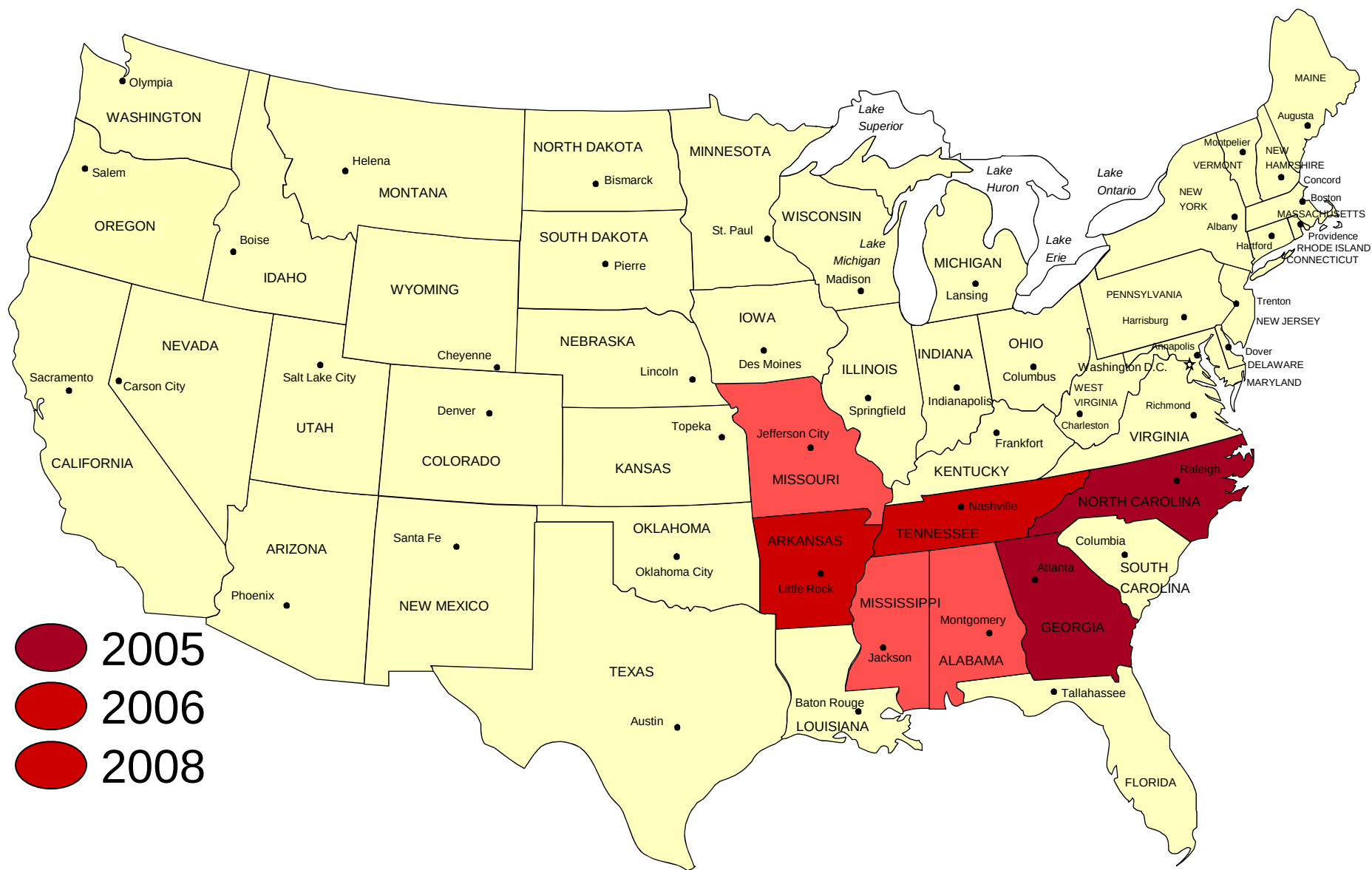
Glyphosate-Resistant Palmer Amaranth in the Southeastern US



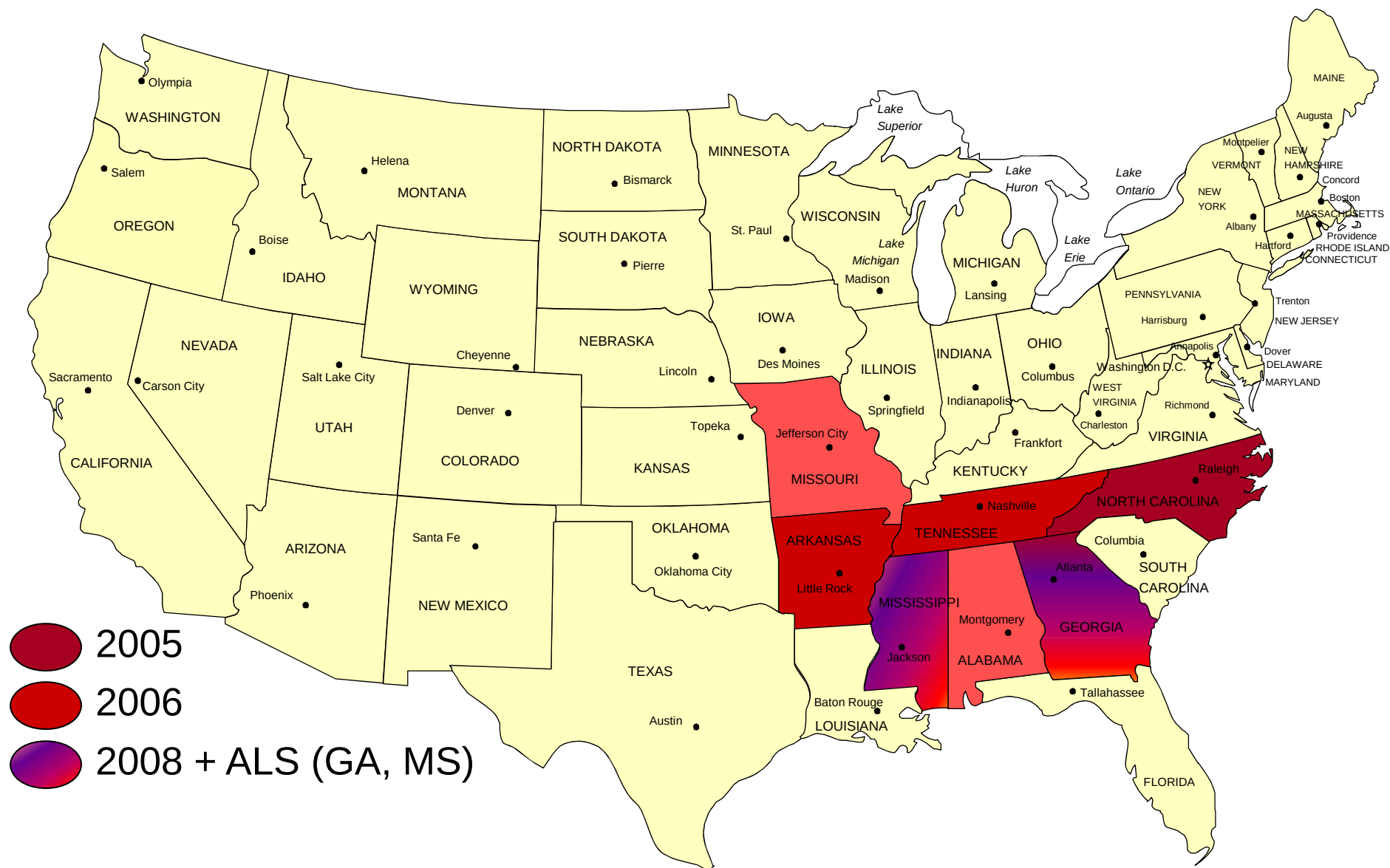
Glyphosate-Resistant Palmer Amaranth in the Southeastern US



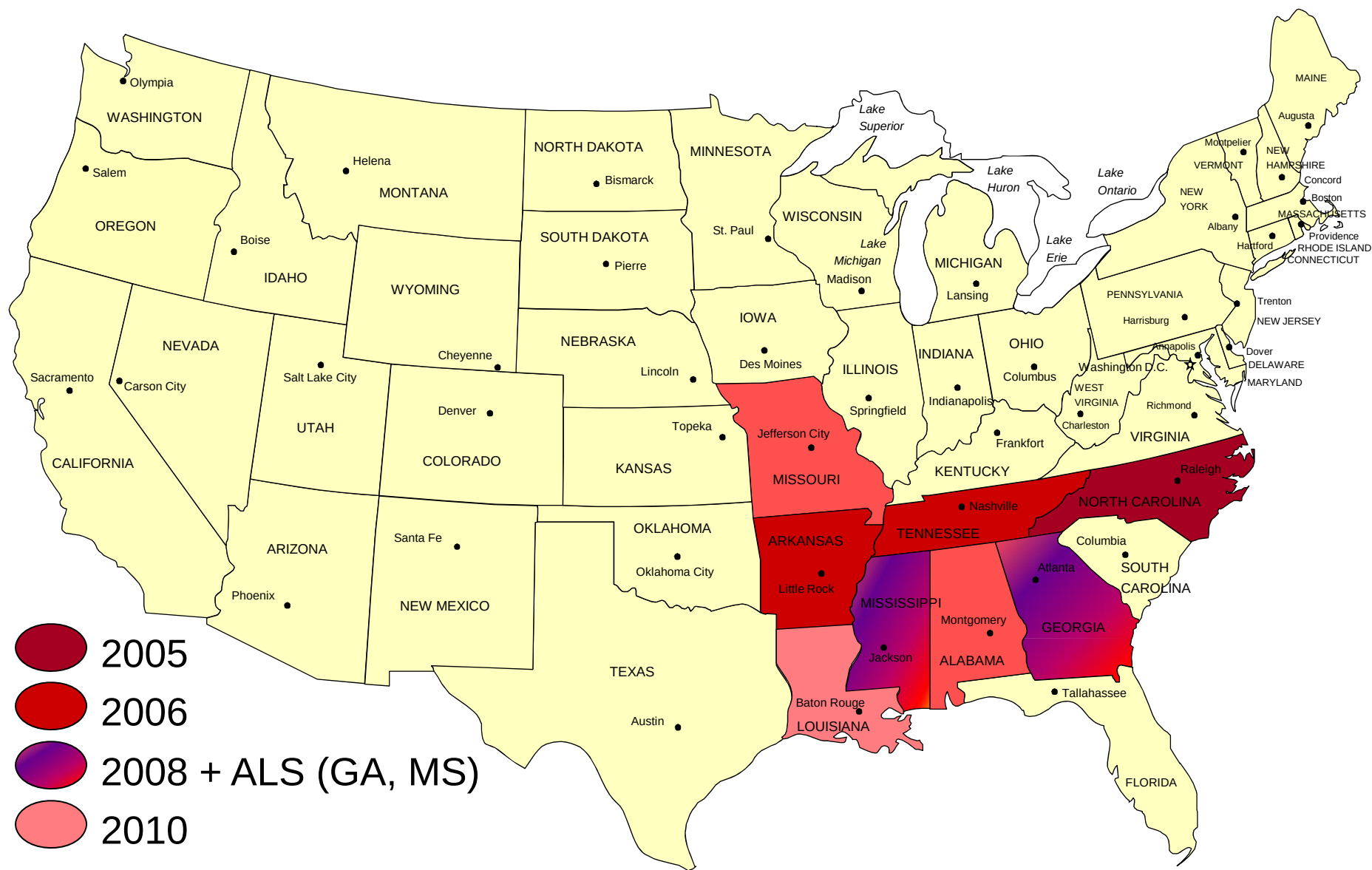
Glyphosate-Resistant Palmer Amaranth in the Southeastern US

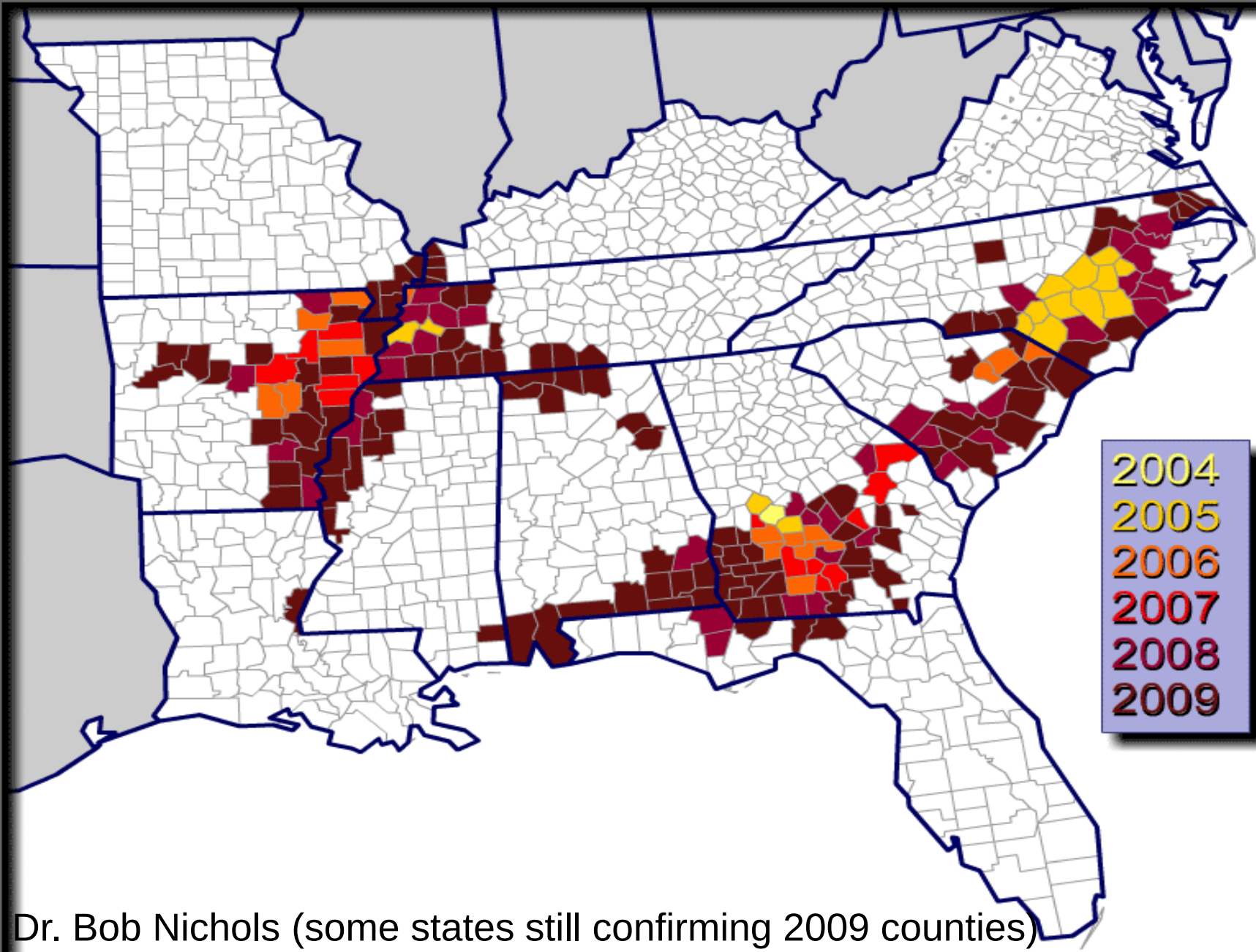


Glyphosate-Resistant Palmer Amaranth in the Southeastern US

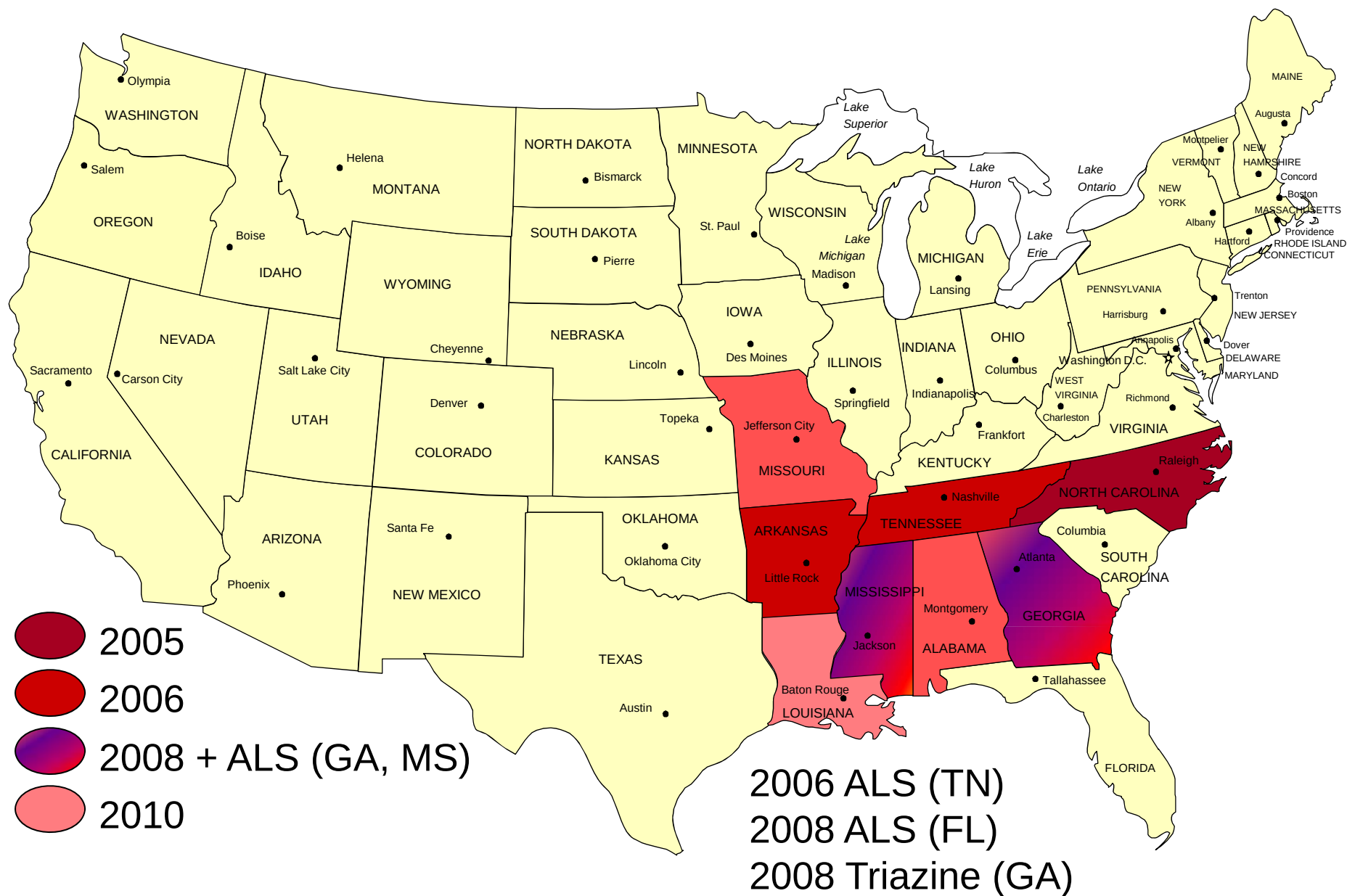


Glyphosate-Resistant Palmer Amaranth in the Southeastern US





Glyphosate-Resistant Palmer Amaranth in the Southeastern US



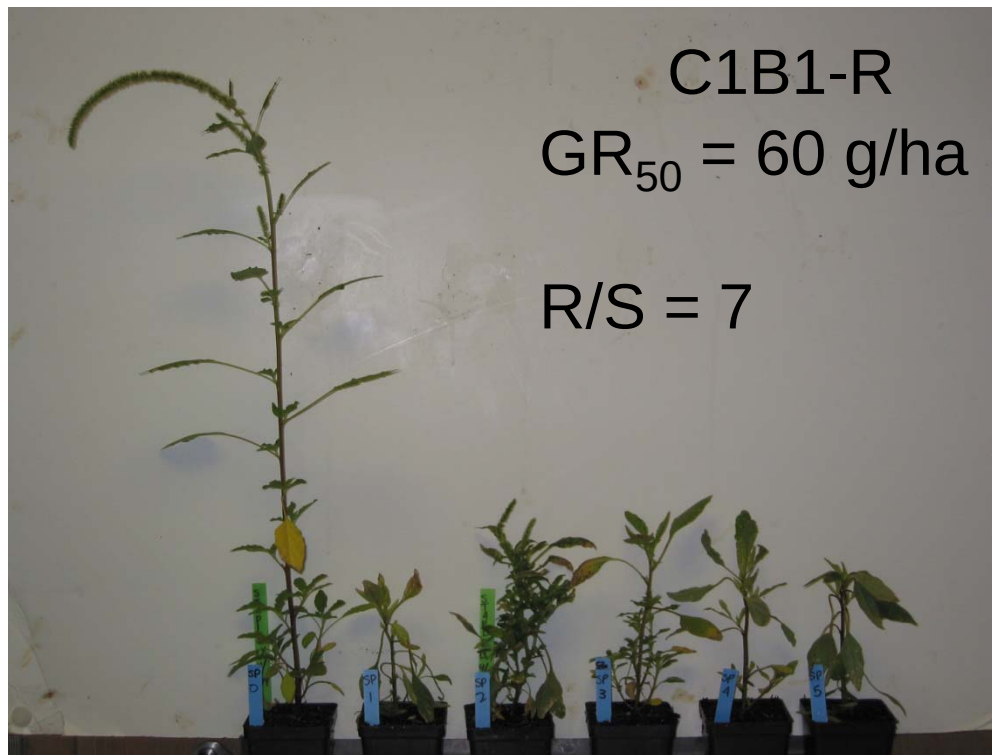


Susceptible



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



C1B1-R
 $GR_{50} = 60 \text{ g/ha}$

$R/S = 7$

0 55 110 220 440 880

15 GPA
 3 WAT
 110 g => (1X)

Pyriithiobac (g ai/ha)



S
 $GR_{50} = 9 \text{ g/ha}$

0 55 110 220 440 880

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

S-metolachlor



Pendimethalin



Nontreated

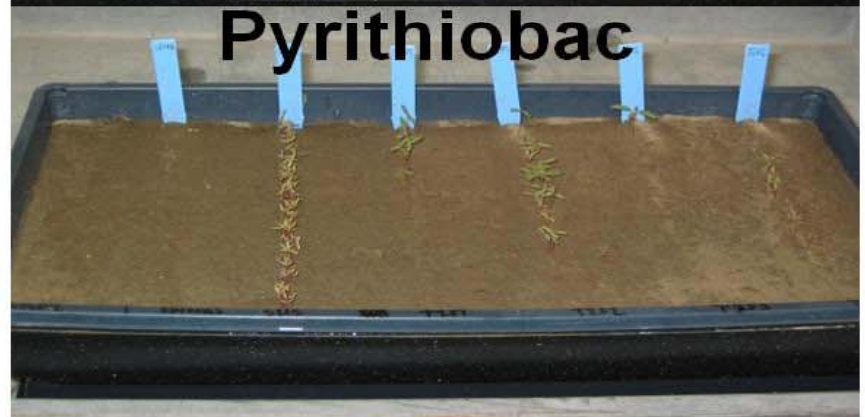
Susceptible check



Fomesafen



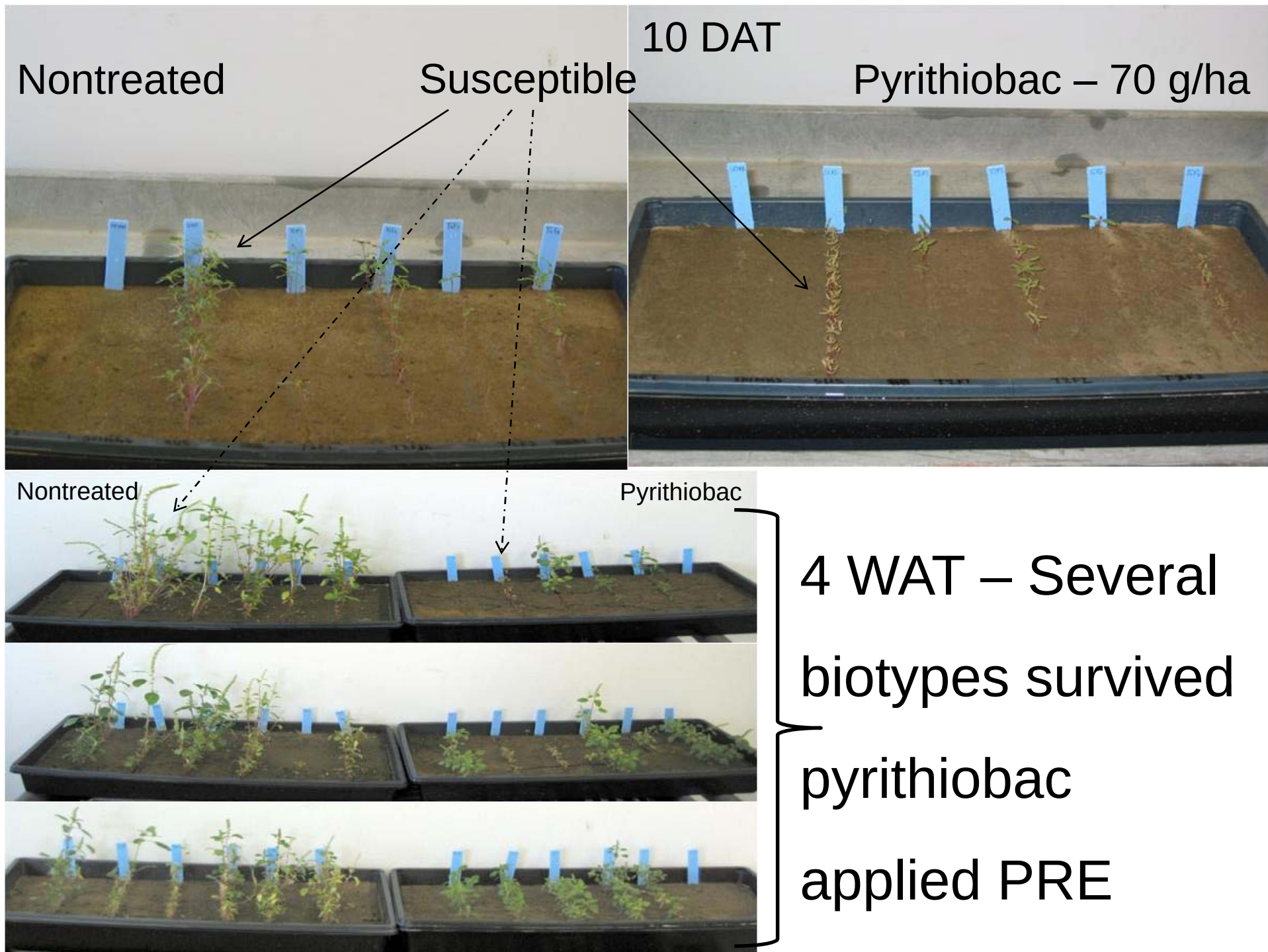
Pyrithiobac





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

A few other
biotypes that
survived
pyriproxyfen 4 WAT





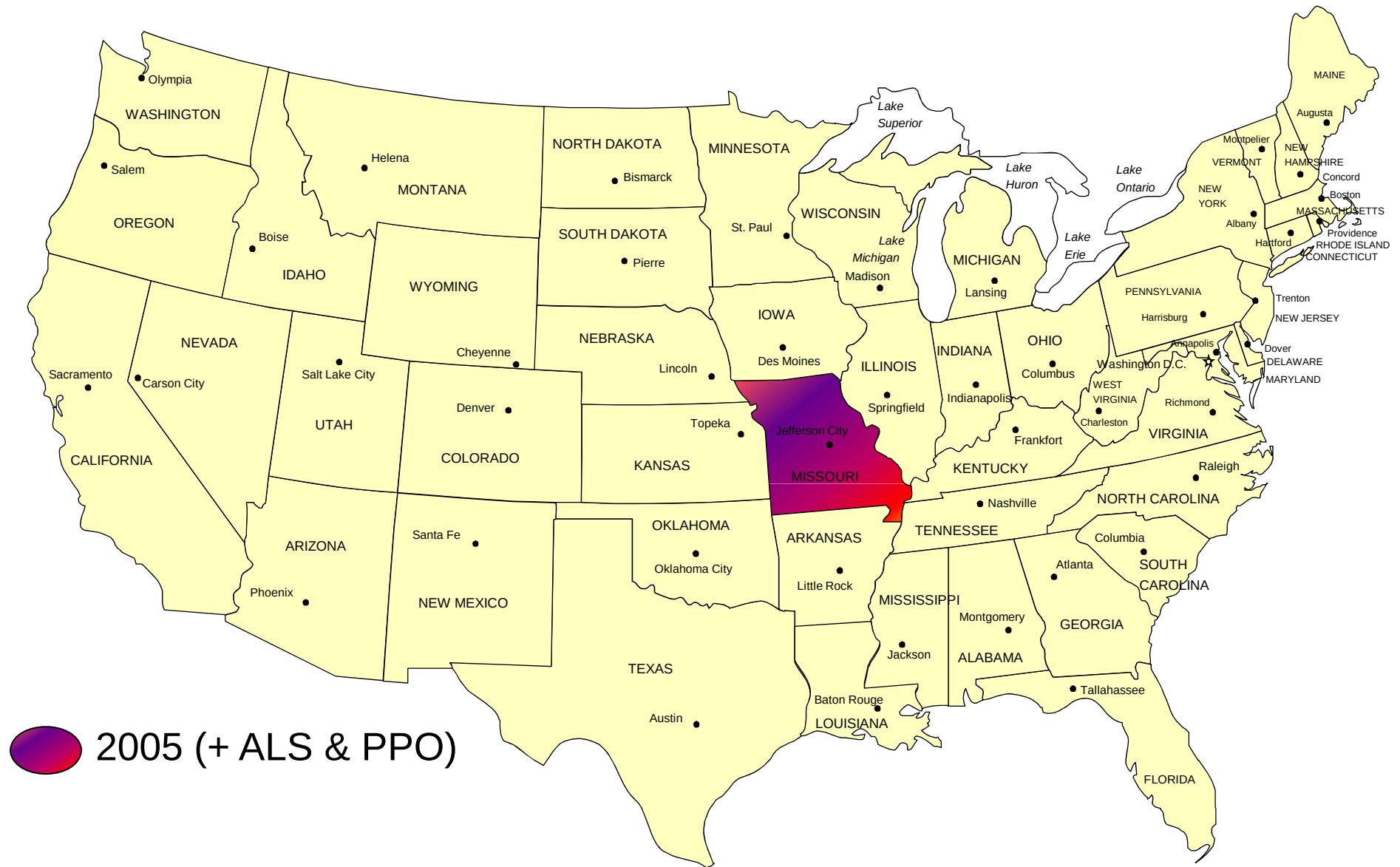
Waterhemp

http://twig.tamu.edu/Waterhemp_amaranthus_tuberculatus_01.jpg

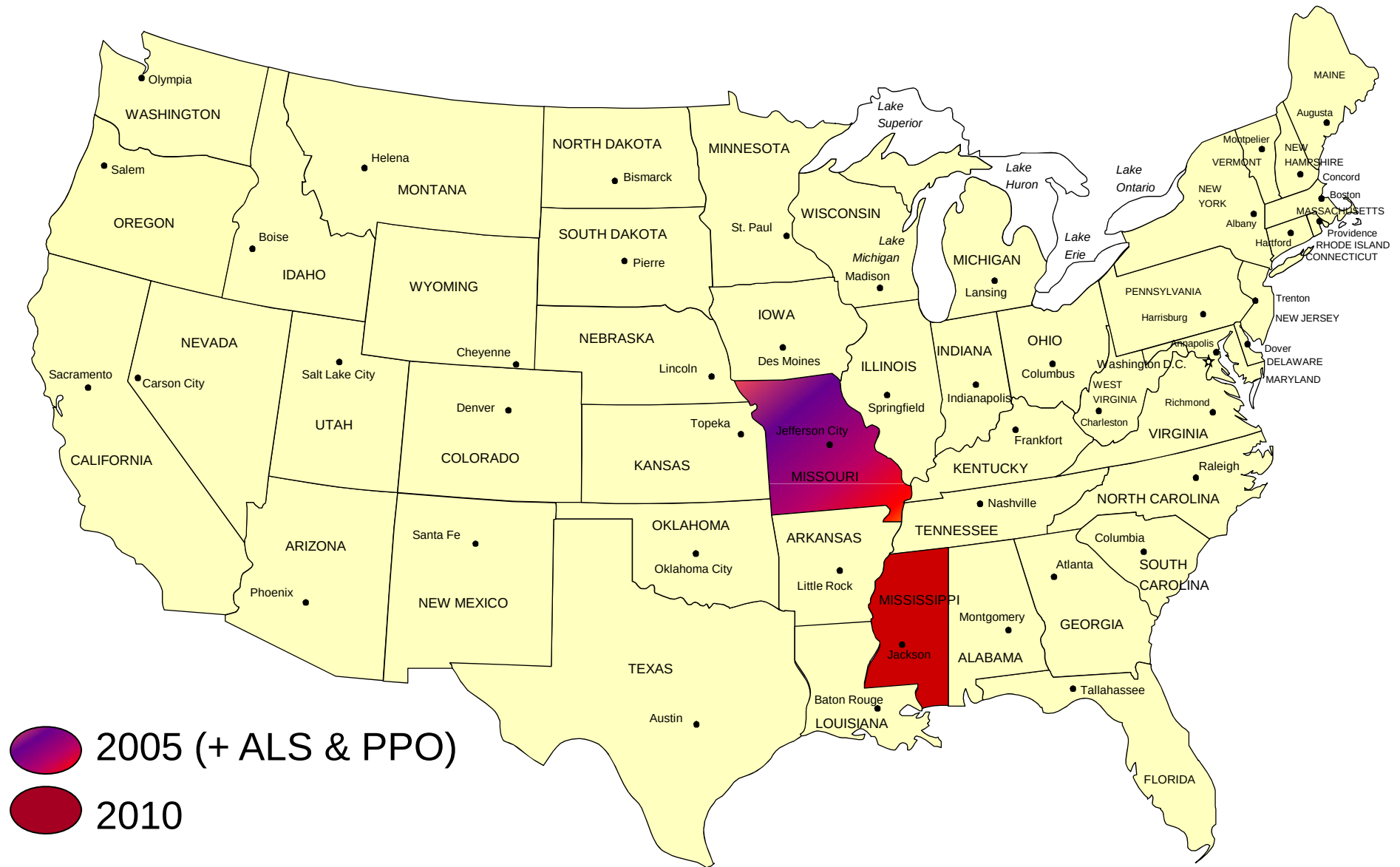
Glyphosate-Resistant Waterhemp in the Southeastern US



Glyphosate-Resistant Waterhemp in the Southeastern US



Glyphosate-Resistant Waterhemp in the Southeastern US



Waterhemp

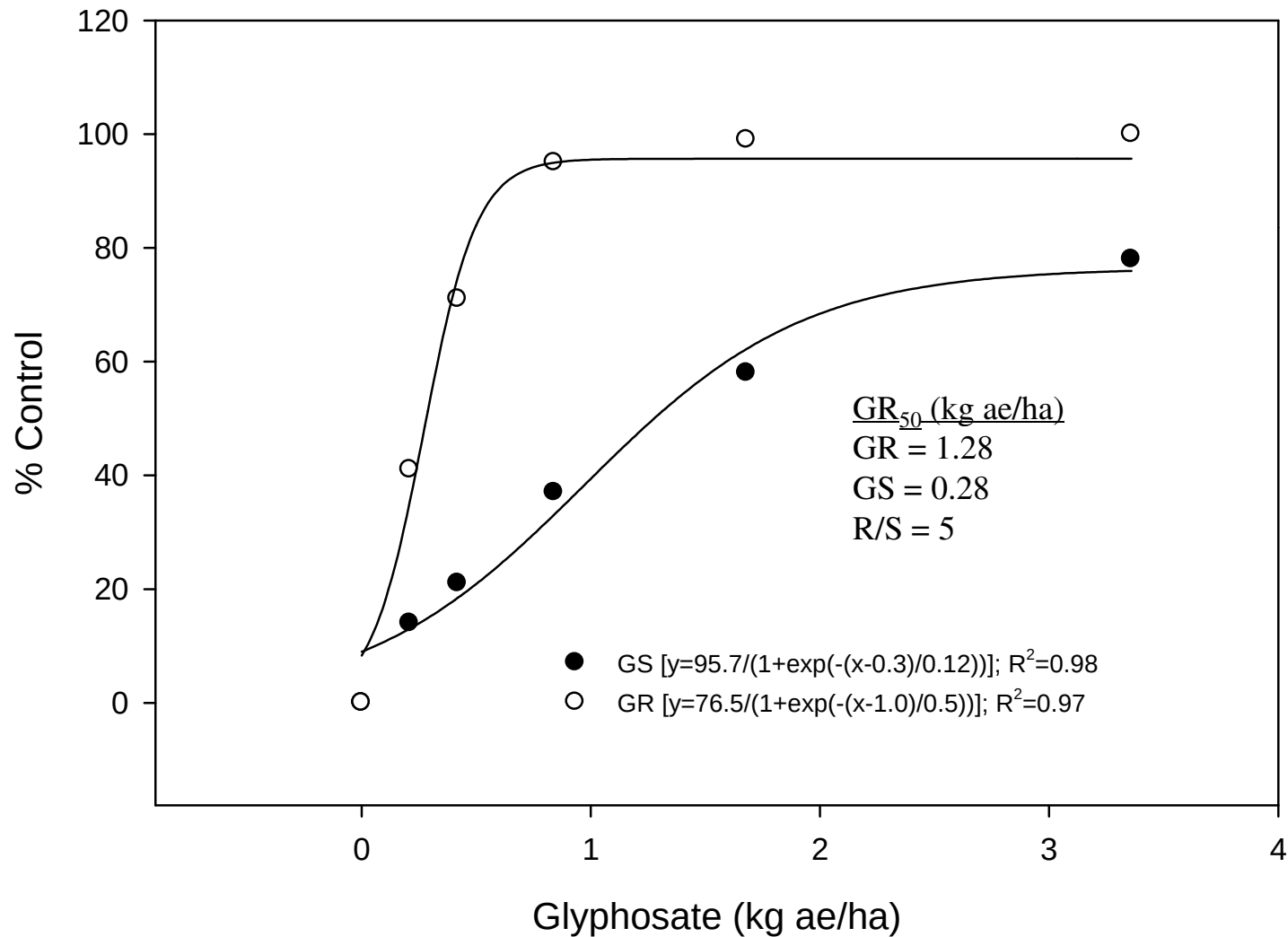
Waterhemp16-Resistant

MO Waterhemp-Susceptible



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

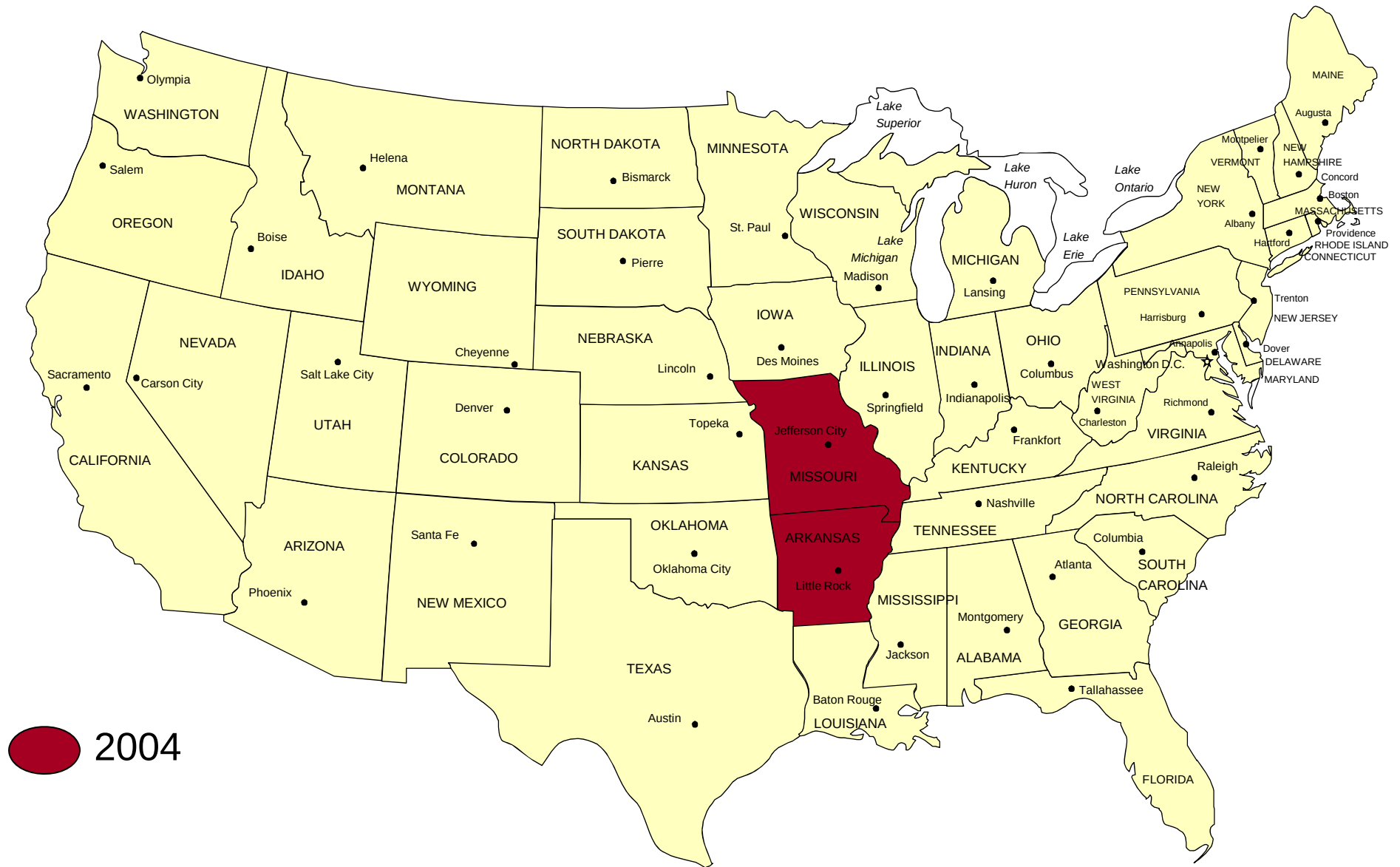
Glyphosate-Resistant Waterhemp



Common Ragweed



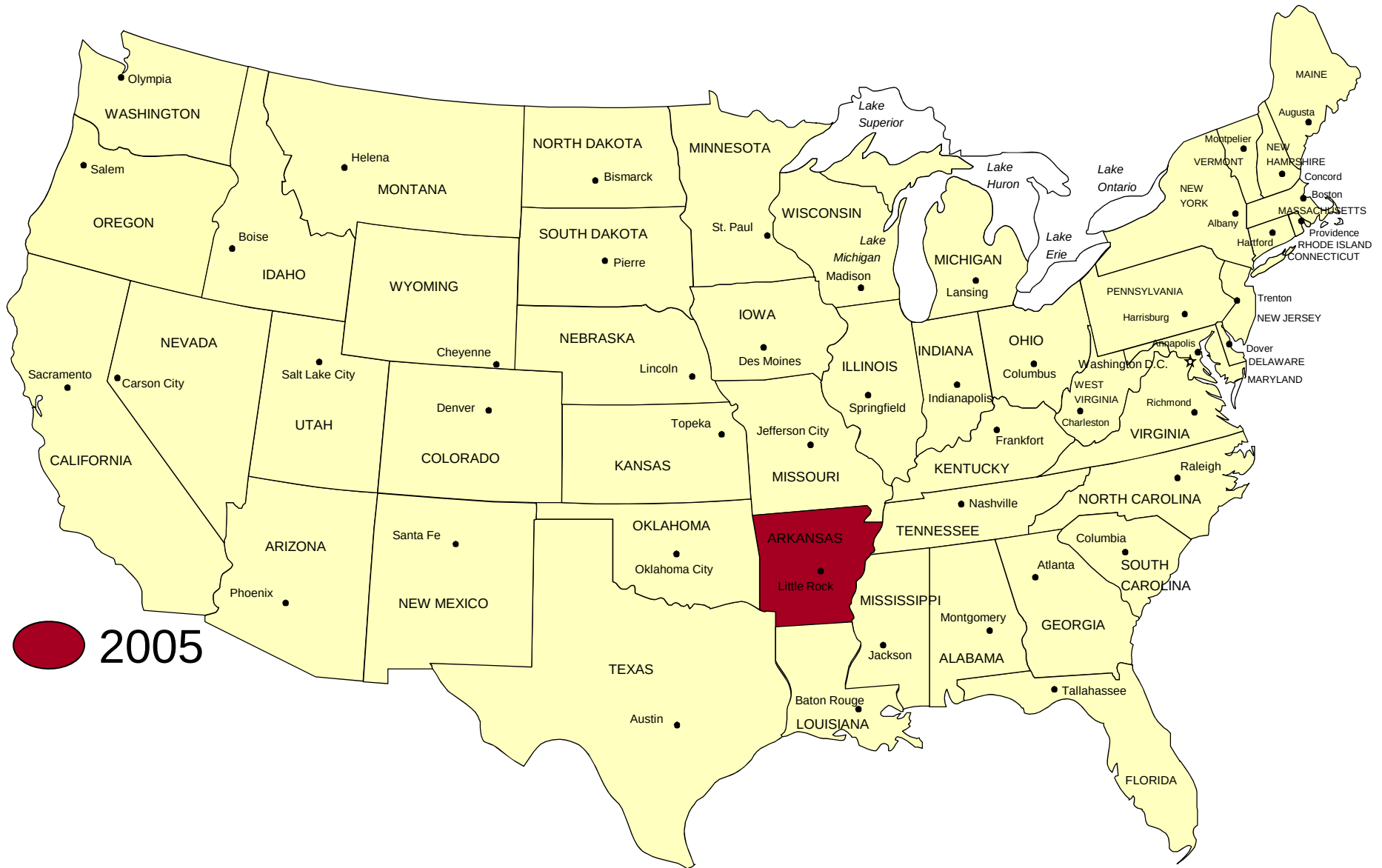
Glyphosate-Resistant Common Ragweed in the Southeastern US



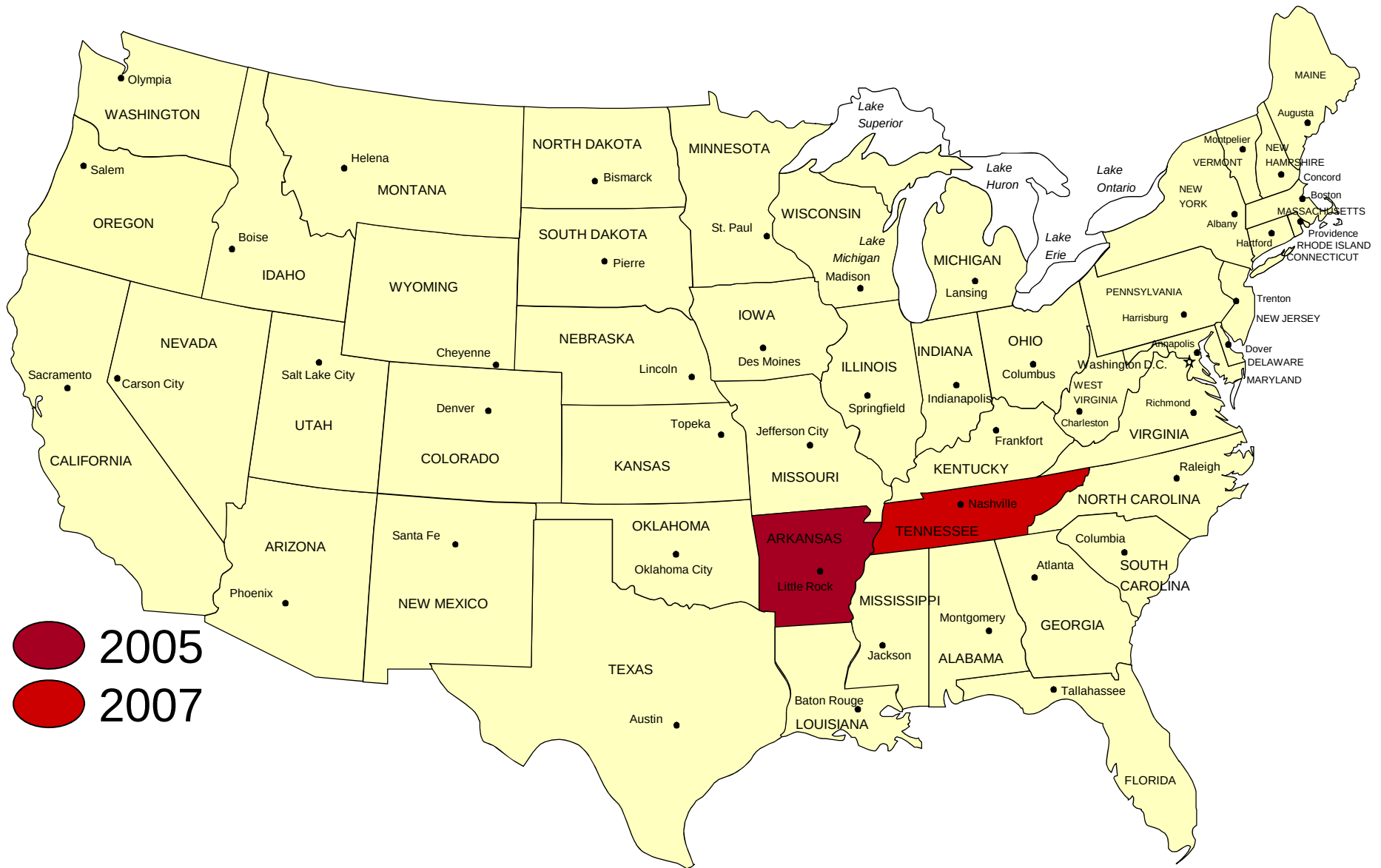
Giant Ragweed



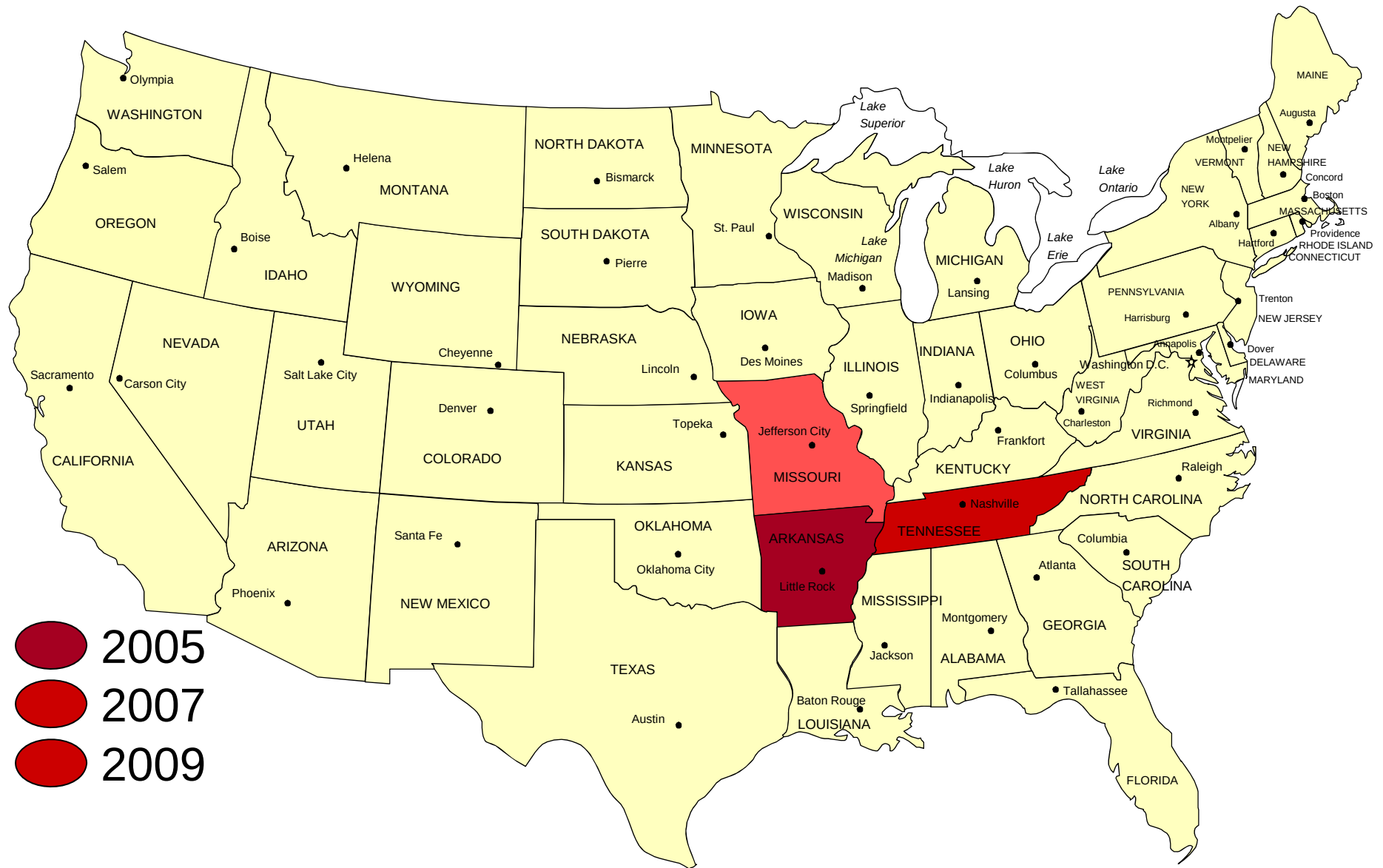
Glyphosate-Resistant Giant Ragweed in the Southeastern US



Glyphosate-Resistant Giant Ragweed in the Southeastern US



Glyphosate-Resistant Giant Ragweed in the Southeastern US

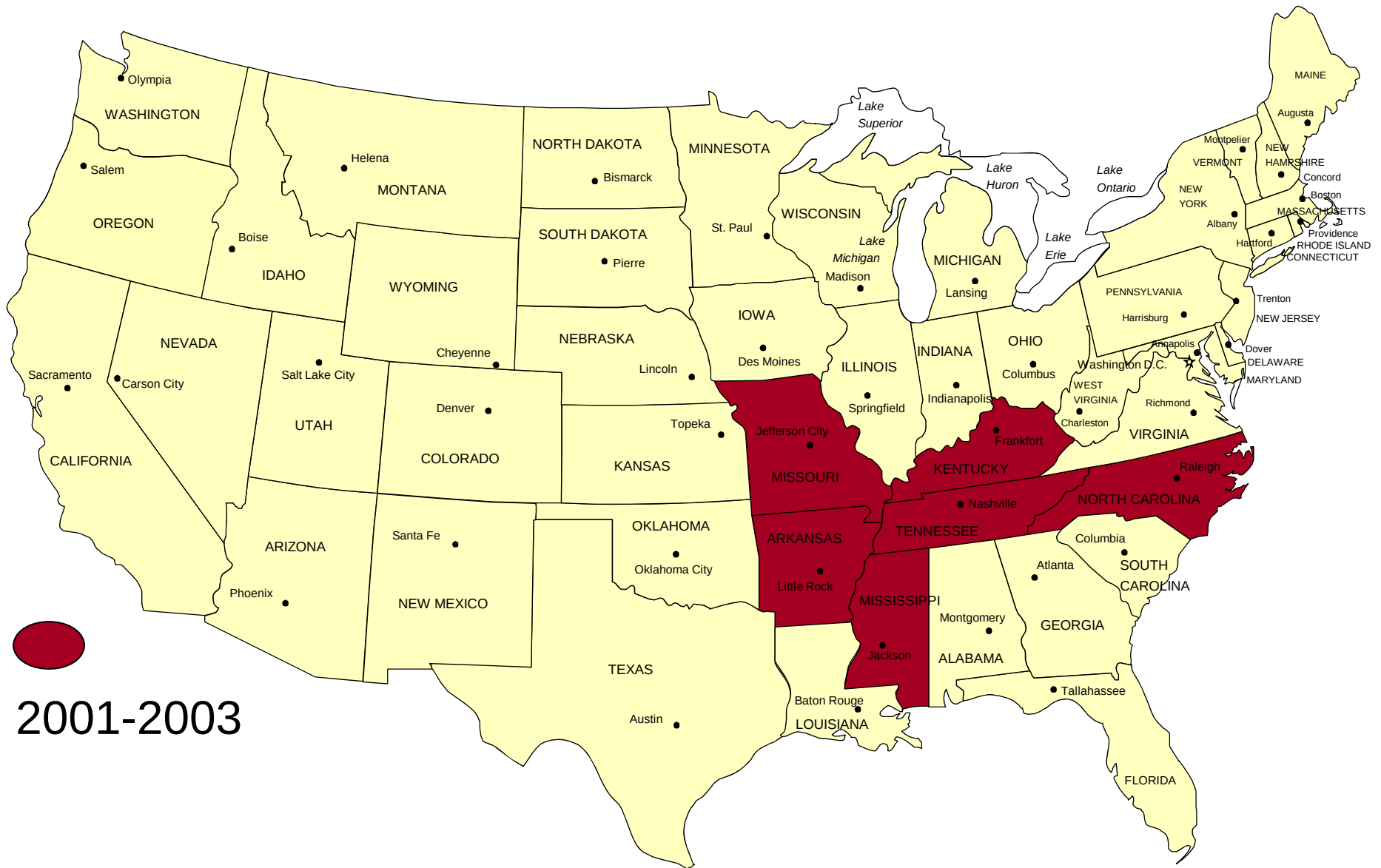


Horseweed

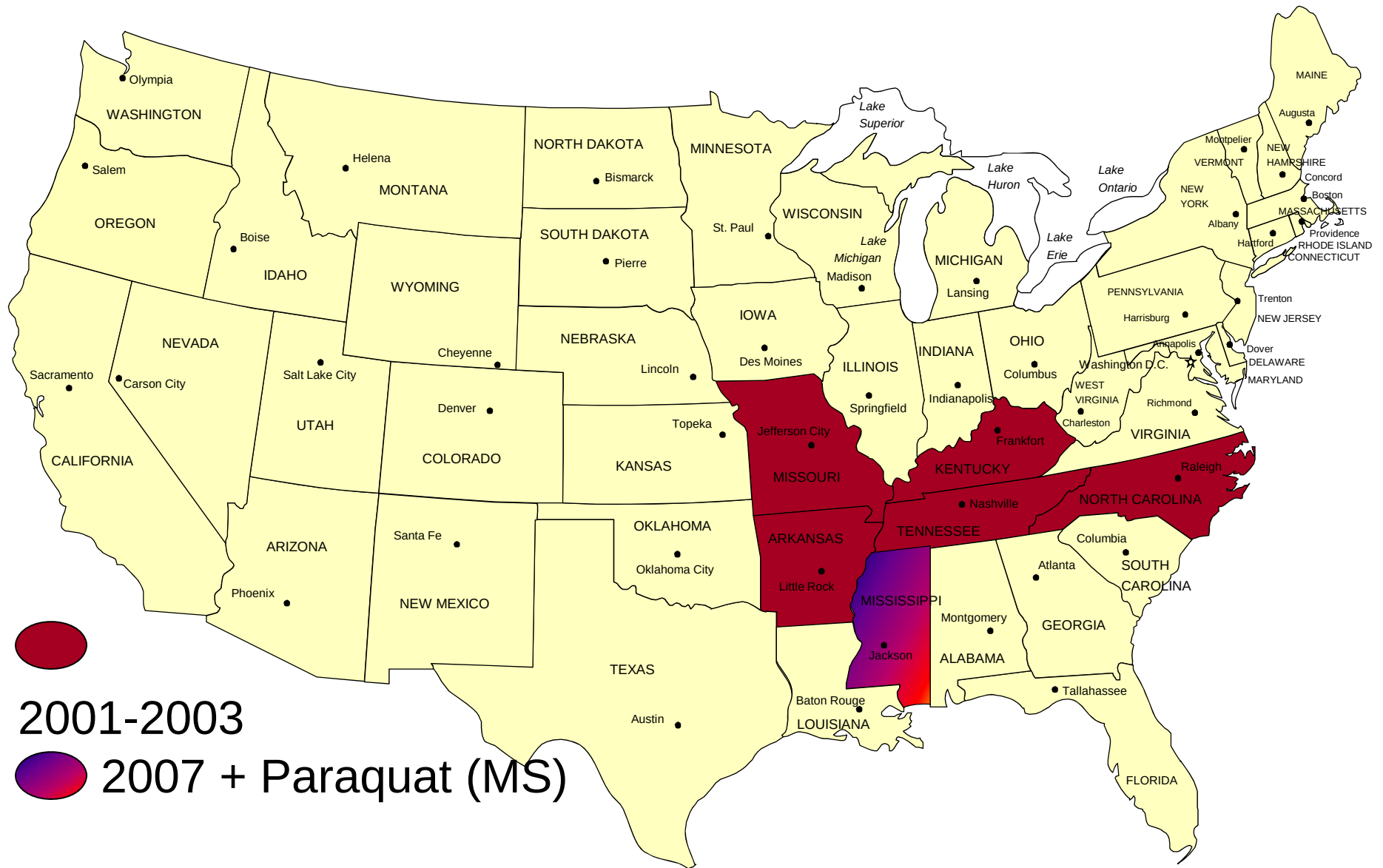


Tom Eubank

Glyphosate-Resistant Horseweed in the Southeastern US



Glyphosate-Resistant Horseweed in the Southeastern US



Italian Ryegrass



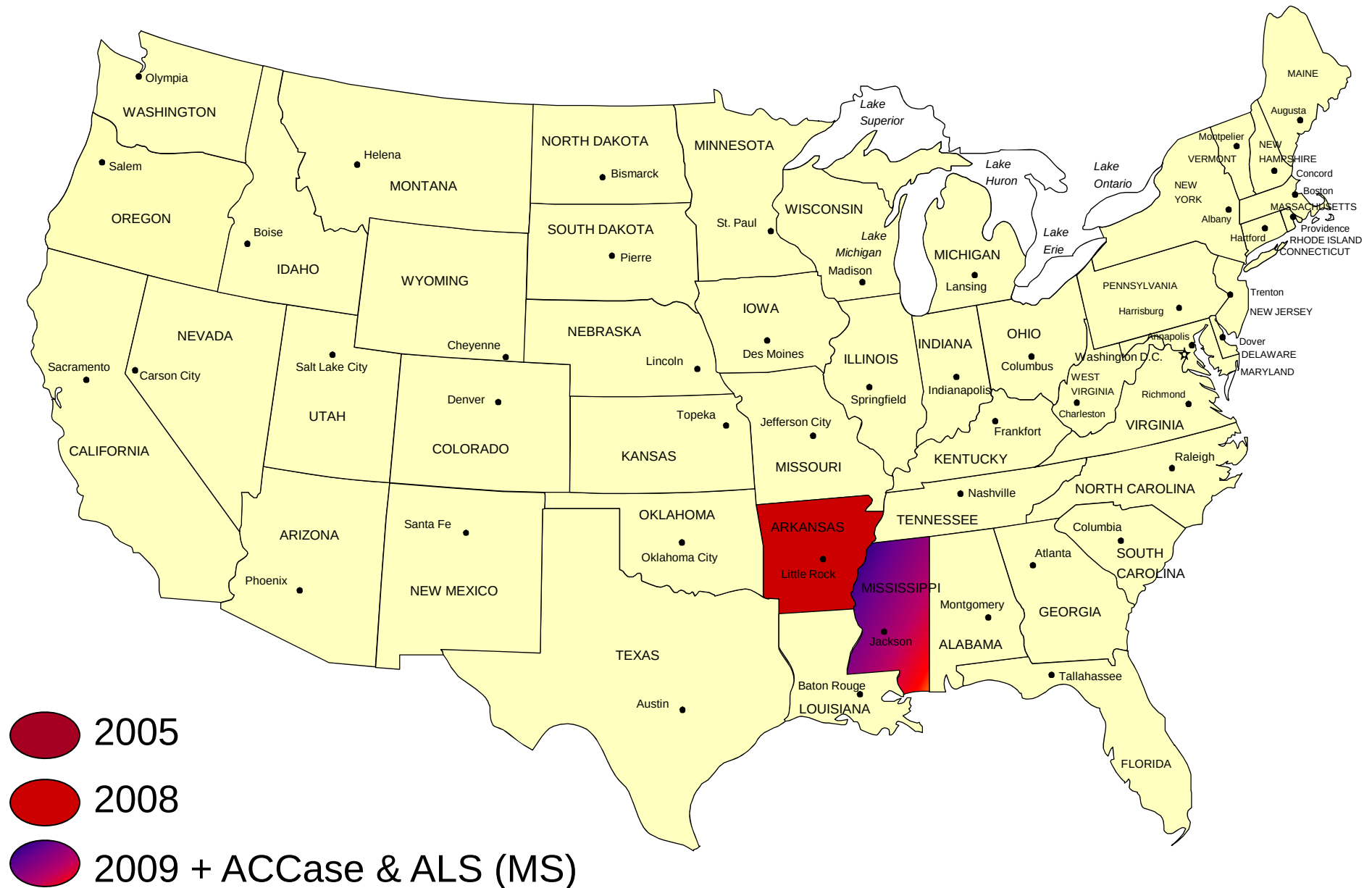
Glyphosate-Resistant Italian Ryegrass in the Southeastern US



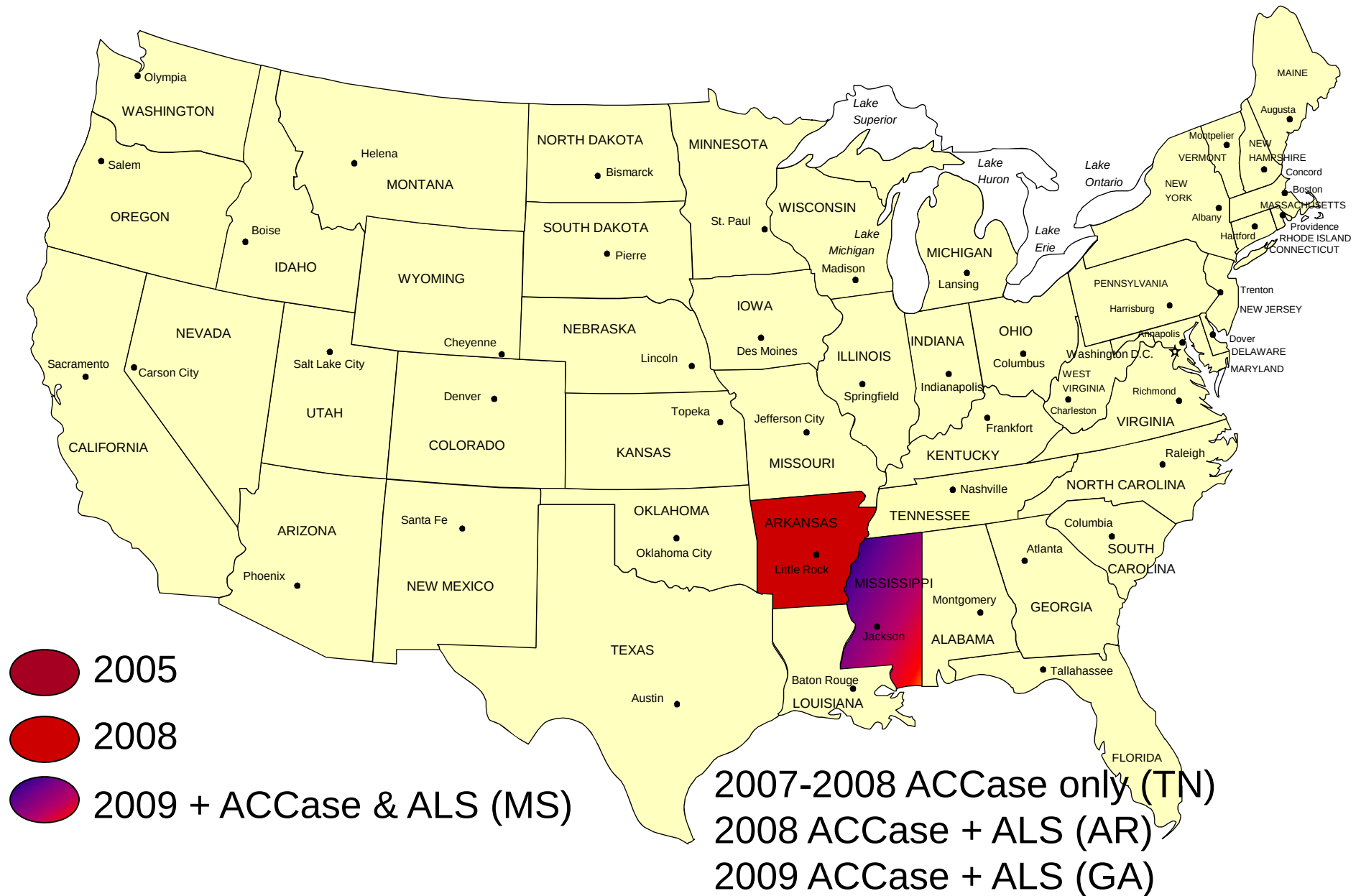
Glyphosate-Resistant Italian Ryegrass in the Southeastern US



Glyphosate-Resistant Italian Ryegrass in the Southeastern US



Glyphosate-Resistant Italian Ryegrass in the Southeastern US

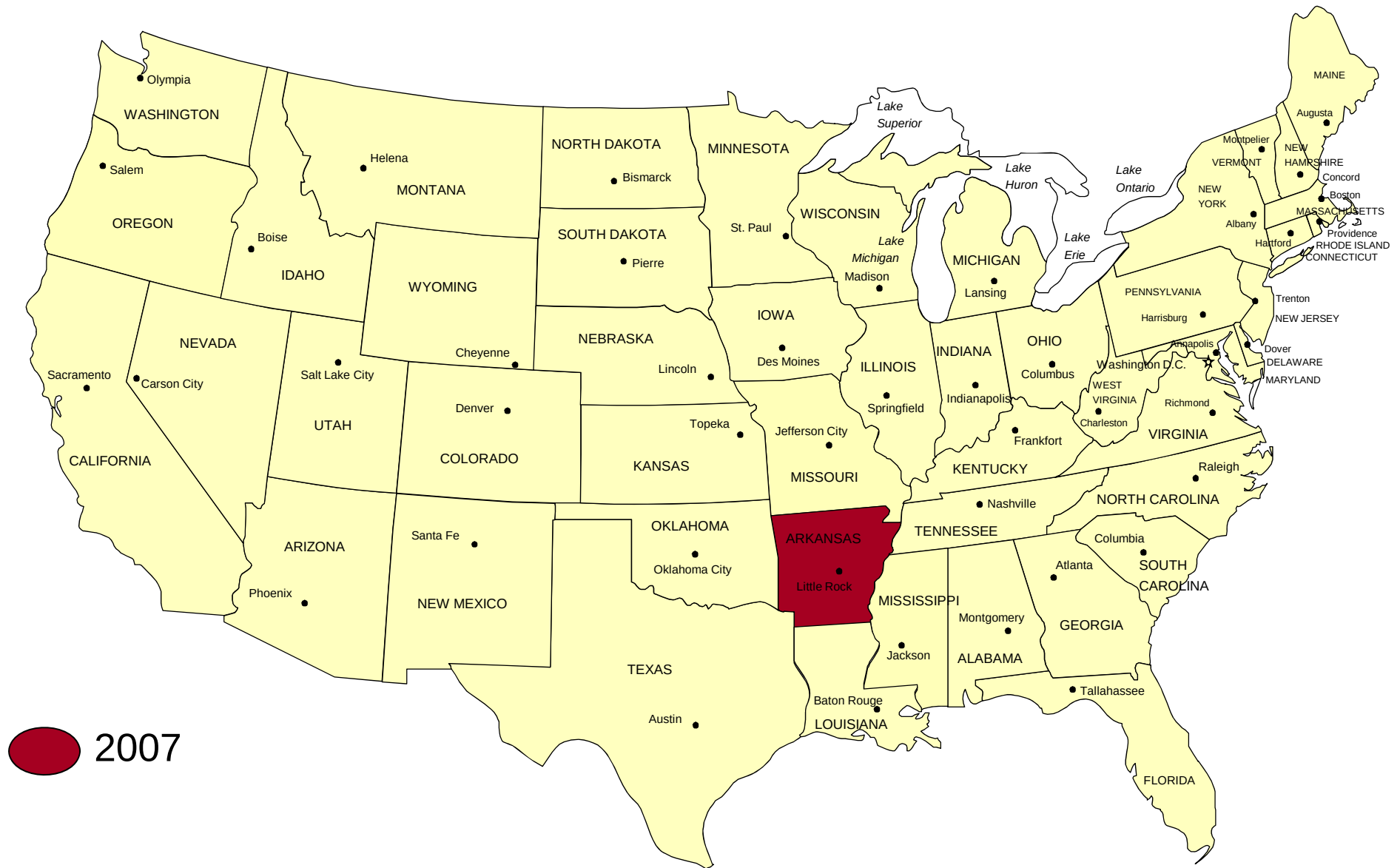


Johnsongrass

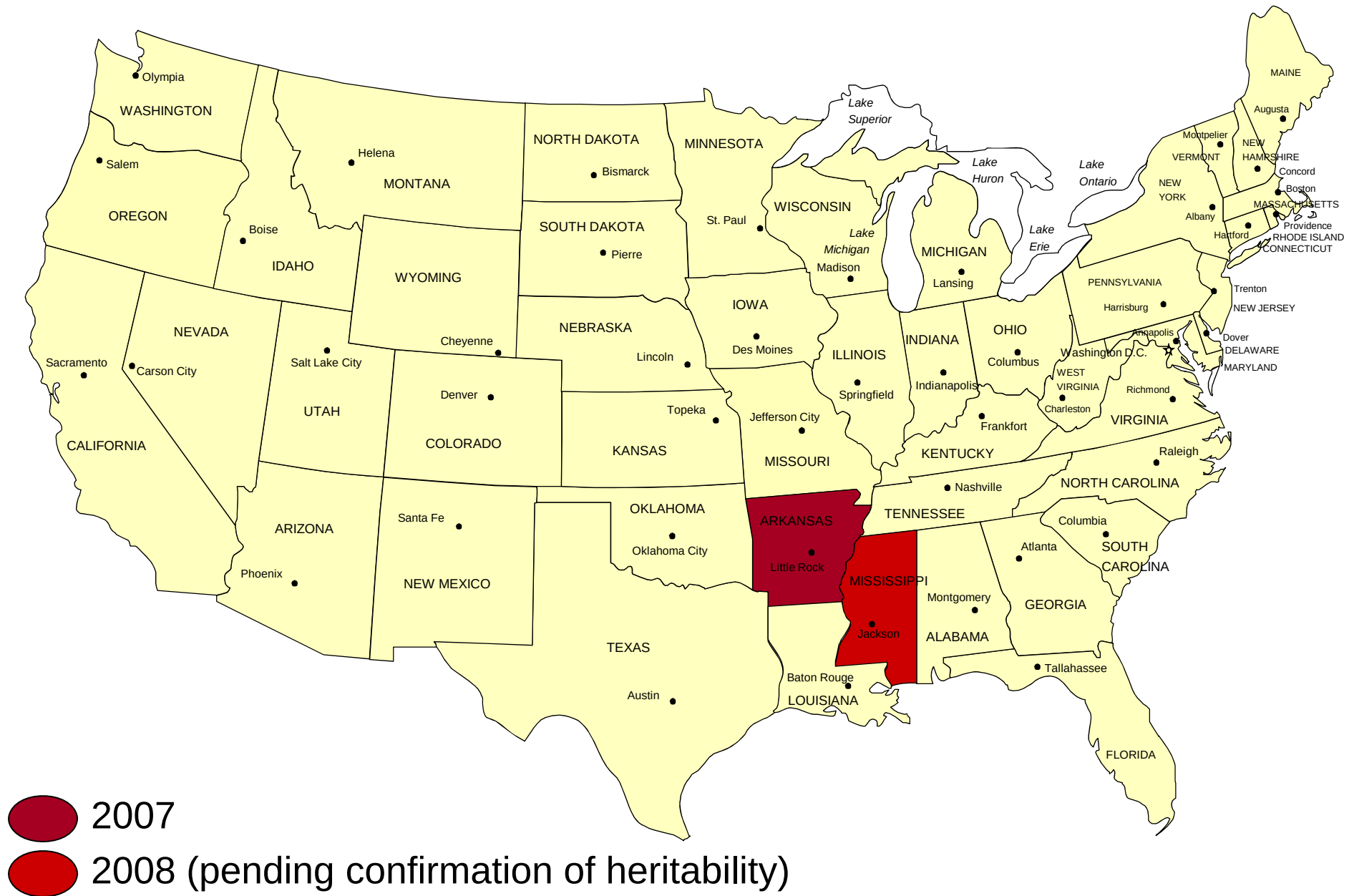


http://www.co.sumner.ks.us/Portals/ks-sumner/Noxious%20Weeds/Johnsongrass_3D.jpg

Glyphosate-Resistant Johnsongrass in the Southeastern US



Glyphosate-Resistant Johnsongrass in the Southeastern US



Non-Glyphosate Resistant Weeds

Non-Glyphosate Resistant Weeds

- Barnyardgrass/Junglerice

www.agf.gov.bc.ca



Non-Glyphosate Resistant Weeds

- Barnyardgrass/Junglerice

Arkansas: Command/ALS/Propanil/Facet

www.agf.gov.bc.ca



Non-Glyphosate Resistant Weeds

- Barnyardgrass/Junglerice

Arkansas: Command/ALS/Propanil/Facet

Mississippi: ALS/Propanil/Facet

www.agf.gov.bc.ca



Non-Glyphosate Resistant Weeds

- Barnyardgrass/Junglerice

Arkansas: Command/ALS/Propanil/Facet

Mississippi: ALS/Propanil/Facet

Louisiana: Propanil/Facet

www.agf.gov.bc.ca



Non-Glyphosate Resistant Weeds

- Barnyardgrass/Junglerice

Arkansas: Command/ALS/Propanil/Facet

Mississippi: ALS/Propanil/Facet

Louisiana: Propanil/Facet

www.agf.gov.bc.ca



- Rice Flatsedge



www.ppws.vt.edu

Non-Glyphosate Resistant Weeds

- Barnyardgrass/Junglerice

Arkansas: Command/ALS/Propanil/Facet

Mississippi: ALS/Propanil/Facet

Louisiana: Propanil/Facet

www.agf.gov.bc.ca



- Rice Flatsedge

Arkansas: ALS



www.ppws.vt.edu

Non-Glyphosate Resistant Weeds

- Barnyardgrass/Junglerice

Arkansas: Command/ALS/Propanil/Facet

Mississippi: ALS/Propanil/Facet

Louisiana: Propanil/Facet

www.agf.gov.bc.ca



- Rice Flatsedge

Arkansas: ALS

Mississippi: ALS



www.ppws.vt.edu

Non-Glyphosate Resistant Weeds

- Barnyardgrass/Junglerice

Arkansas: Command/ALS/Propanil/Facet

Mississippi: ALS/Propanil/Facet

Louisiana: Propanil/Facet



www.agf.gov.bc.ca

- Rice Flatsedge

Arkansas: ALS

Mississippi: ALS



www.ppws.vt.edu

- Amazon Sprangletop



www.lsuagcenter.com

Non-Glyphosate Resistant Weeds

- Barnyardgrass/Junglerice

Arkansas: Command/ALS/Propanil/Facet

Mississippi: ALS/Propanil/Facet

Louisiana: Propanil/Facet



www.agf.gov.bc.ca

- Rice Flatsedge

Arkansas: ALS

Mississippi: ALS



www.ppws.vt.edu

- Amazon Sprangletop

Arkansas: ACCase



www.lsuagcenter.com

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

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

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