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

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Delta Research and Extension Center
Mississippi State University

November 10, 2010
Herbicide Resistance Worldwide
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Source: Ian Heap
http://WeedScience.com
Herbicide Resistance Worldwide

as of November 2, 2010

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www.weedscience.com
Herbicide Resistance Worldwide

- 348 Resistant Biotypes

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- 194 Species (114 dicots and 80 monocots)

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Glyphosate-Resistant Weeds
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• Worldwide – 20 weed species
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• United States – 11 weed species
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• 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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- 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)

www.weedscience.com
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• Worldwide – 20 weed species

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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)

www.weedscience.com
Palmer Amaranth
Glyphosate-Resistant Palmer Amaranth in the Southeastern US
Glyphosate-Resistant Palmer Amaranth in the Southeastern US

2005

2006

2008 + ALS (GA, MS)
Glyphosate-Resistant Palmer Amaranth in the Southeastern US

- 2005
- 2006
- 2008 + ALS (GA, MS)
- 2010
Dr. Bob Nichols (some states still confirming 2009 counties)
Glyphosate-Resistant Palmer Amaranth in the Southeastern US

2005
2006
2008 + ALS (GA, MS)
2010
2006 ALS (TN)
2008 ALS (FL)
2008 Triazine (GA)
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 g/ha
R/S = 7

GR$_{50}$ = 9 g/ha

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

Pyrithiobac (g ai/ha)
Emergence of Palmer amaranth seedlings 10 DAT - None in S-metolachlor, fomesafen, and pendimethalin, but some through 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.
Several biotypes survived Pyrithiobac applied PRE.
Waterhemp

http://twig.tamu.edu/Waterhemp_amaranthus_tuberculatus_01.jpg
Glyphosate-Resistant Waterhemp in the Southeastern US

2005 (+ ALS & PPO)

2010
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 Waterhemph
Common Ragweed

weedscience.com
Giant Ragweed
Glyphosate-Resistant Giant Ragweed in the Southeastern US
Horseweed

Tom Eubank
Glyphosate-Resistant Horseweed in the Southeastern US

2001-2003
Italian Ryegrass
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

2007

2008 (pending confirmation of heritability)
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

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Non-Glyphosate Resistant Weeds

- Barnyardgrass/Junglerice
  - Arkansas: Command/ALS/Propanil/Facet
  - Mississippi: ALS/Propanil/Facet

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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

• Rice Flatsedge
Non-Glyphosate Resistant Weeds

• Barnyardgrass/Junglerice
  Arkansas: Command/ALS/Propanil/Facet
  Mississippi: ALS/Propanil/Facet
  Louisiana: Propanil/Facet

• Rice Flatsedge
  Arkansas: ALS

www.agf.gov.bc.ca

www.ppws.vt.edu
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• Rice Flatsedge
  Arkansas: ALS
  Mississippi: ALS

• Amazon Sprangletop
Non-Glyphosate Resistant Weeds

• Barnyardgrass/Junglerice
  
  Arkansas: Command/ALS/Propanil/Facet  
  Mississippi: ALS/Propanil/Facet  
  Louisiana: Propanil/Facet

• Rice Flatsedge
  
  Arkansas: ALS  
  Mississippi: ALS

• Amazon Sprangletop
  
  Arkansas: ACCase
## Summary – Recent Resistance Cases in Mississippi, Mid-South, & Southeastern US

<table>
<thead>
<tr>
<th>Weed Type</th>
<th>Herbicide</th>
<th>States/Resistance Mechanisms</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palmer Amaranth</td>
<td>Glyphosate</td>
<td>AL, AR, FL, GA (+ALS), KY, LA, MS (+ ALS), MO, NC, SC, TN</td>
<td></td>
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<tr>
<td></td>
<td>ALS</td>
<td>FL, TN</td>
<td></td>
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<tr>
<td></td>
<td>Triazine</td>
<td>GA</td>
<td></td>
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<tr>
<td>Waterhemp</td>
<td>Glyphosate</td>
<td>MO, MS</td>
<td></td>
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<tr>
<td></td>
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<td>TN</td>
<td></td>
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<td>Common Ragweed</td>
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</tr>
<tr>
<td>Horseweed</td>
<td>Glyphosate</td>
<td>AR, KY, MS, MO, NC, TN</td>
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<tr>
<td>Italian ryegrass</td>
<td>Glyphosate</td>
<td>AR, MS (+ACCase &amp; ALS)</td>
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<tr>
<td></td>
<td>ACCase</td>
<td>AR (+ALS), GA (+ALS)</td>
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<tr>
<td>Johnsongrass</td>
<td>Glyphosate</td>
<td>AR, MS (pending heritability tests)</td>
<td></td>
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<tr>
<td>Barnyardgrass (Junglerice)</td>
<td>Propanil/Facet</td>
<td>AR (also Command), MS, LA</td>
<td></td>
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<td>AR, MS</td>
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<td>Amazon Sprangletop</td>
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<td>AR</td>
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</table>
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Thank you

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