Fall-Spring Management of Glyphosate-resistant Italian Ryegrass

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Emergence Patterns

GR Italian Ryegrass Emergence in Mississippi

![Graph showing emergence patterns of GR Italian Ryegrass over different years and months. The graph includes data from 2009-10 (n=4), 2010-2011 (n=36), and 2011-2012 (n=32) with density in no./m² plotted against time from 15-Aug to 15-Apr.](#)
Residual Herbicide Timing

GR Italian Ryegrass Control in Early-March
2009-10 and 2010-11

*Data pooled over three studies.

Application timing:
- September
- October
- November

Control (%):
- Double disk
- Dual Mag.-1.33 PT
- Command-2 PT
- Treflan-3 PT
- Zidua-2.77 OZ

Legend:
- a
- b
- c
- d
- e
- f

Note: All data points are represented by letters indicating statistical significance.
Does Tillage Help?

Double disk treatments

September timing  October timing  November timing

March 31, 2010
**Early-spring Applications**

**GR Italian Ryegrass Control on April 12, 2010**

*Data pooled over two studies.*

![Bar Chart](Image)

- **November 5**
  - Glyphosate: 10%
  - Select Max-12 OZ: 30%
  - Select Max-16 OZ: 20%
  - Fusilade-12 OZ: 50%
  - Fusilade-16 OZ: 40%
  - Assure II-8 OZ: 30%
  - Assure II-12 OZ: 20%

- **January 13**
  - Glyphosate: 20%
  - Select Max-12 OZ: 40%
  - Select Max-16 OZ: 30%
  - Fusilade-12 OZ: 70%
  - Fusilade-16 OZ: 60%
  - Assure II-8 OZ: 50%
  - Assure II-12 OZ: 40%

- **March 1**
  - Glyphosate: 30%
  - Select Max-12 OZ: 50%
  - Select Max-16 OZ: 40%
  - Fusilade-12 OZ: 80%
  - Fusilade-16 OZ: 70%
  - Assure II-8 OZ: 60%
  - Assure II-12 OZ: 50%

Legend:
- Glyphosate
- Select Max-12 OZ
- Select Max-16 OZ
- Fusilade-12 OZ
- Fusilade-16 OZ
- Assure II-8 OZ
- Assure II-12 OZ
Late-spring Applications

Gramoxone Inteon Tank-mixtures
GR Italian Ryegrass Control 28 DAT

*Data pooled over two studies.

- Gramoxone Inteon 3 PT/A
- Gramoxone Inteon 4 PT/A

Control (%)

- No tank-mix
- Sencor-7 OZ
- Aatrex-1 QT
- Direx-1.6 PT

Legend:
- Red: No tank-mix
- Yellow: Sencor-7 OZ
- Blue: Aatrex-1 QT
- Green: Direx-1.6 PT

Data indicate significant differences among treatments.
Problem

• Only 6 commercial herbicides are effective against GR Italian ryegrass—4 residuals and 2 POST herbicides.
• GR Italian ryegrass has broad emergence window ranging from August-September to March-April.
• Environmental conditions make herbicide applications challenging during the optimum application window.
• Biomass accumulation and stiff straw of Italian ryegrass negatively impact planting and seedling development.
Fall-Spring Programs

• **Factor 1**: Fall application
  – No fall treatment
  – Double disk
  – Dual Magnum at 1.33 PT/A + Gramoxone at 3 PT/A

• **Factor 2**: Winter application
  – No winter treatment
  – Select Max at 12 OZ/A

• **Factor 3**: Spring application
  – No spring treatment
  – Gramoxone SL at 4 PT/A
Fall-Spring Programs

GR Italian Ryegrass Control on 15 Days After Final Treatment

![Bar chart showing the control of GR Italian Ryegrass under different treatments. The treatments include No fall treatment, Double disk; November, and Dual Magnum 1.33 PT/A; November. The chart indicates the percentage of control with data pooled over five studies.]

*Data pooled over five studies.*

Control (%)

- No fall treatment
- Double disk; November
- Dual Magnum 1.33 PT/A; November

Legend:
- No POST
- Gramoxone SL 4 PT/A; February
- Select Max 12 OZ/A; January
- Select Max fb Gramoxone SL
No fall treatment

No POST

Select Max 12 OZ/A; Jan.

Gramoxone SL 4 PT/A; Feb.

Select Max fb Gramoxone SL

March 20, 2012
Double disk; November

No POST

Select Max 12 OZ/A; Jan.

Gramoxone SL 4 PT/A; Feb.

Select Max fb Gramoxone SL

March 20, 2012
Dual Magnum at 1.33 PT/A; November

No POST

Select Max 12 OZ/A; Jan.

Gramoxone SL 4 PT/A; Feb.

Select Max fb Gramoxone SL

March 24, 2011
Fall-Spring Programs

Cotton Yield Following Italian Ryegrass Control Programs

- No fall treatment
- Double disk; November
- Dual Magnum 1.33 PT/A; November

Yield (LB/A):
- No飘 POST
- Gramoxone SL 4 PT/A; February
- Select Max 12 OZ/A; January
- Select Max fb Gramoxone SL

Legend:
- No POST
- Gramoxone SL 4 PT/A; February
- Select Max 12 OZ/A; January
- Select Max fb Gramoxone SL
Fall-Spring Programs

Soybean Yield Following Italian Ryegrass Control Programs

<table>
<thead>
<tr>
<th>Treatment</th>
<th>No fall treatment</th>
<th>Double disk; November</th>
<th>Dual Magnum 1.33 PT/A; November</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield (bushels/A)</td>
<td>No POST</td>
<td>Select Max 12 OZ/A; January</td>
<td>Select Max fb Gramoxone SL</td>
</tr>
<tr>
<td>No POST</td>
<td>b</td>
<td>b</td>
<td>a</td>
</tr>
<tr>
<td>Gramoxone SL 4 PT/A; February</td>
<td>b</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>Select Max fb Gramoxone SL</td>
<td></td>
<td></td>
<td>a</td>
</tr>
</tbody>
</table>
Fall-Spring Programs

May 18, 2012

Gramoxone SL in March

Dual Magnum in November
fb Gramoxone SL in March
Fall-Spring Programs

August 16, 2012

Gramoxone SL in March

Dual Magnum in November fb Gramoxone SL in March
Italian Ryegrass in Corn

Source: T.W. Eubank
Fall-Spring Programs

Corn Yield Following Italian Ryegrass Control Programs

Yield (bushels/A)

No fall treatment
Double disk; November
Dual Magnum 1.33 PT/A; November

- No POST
- Gramoxone SL 4 PT/A; February
- Select Max 12 OZ/A; January
- Select Max fb Gramoxone SL
No fall program fb Select Max; Jan. fb Gramoxone; Feb.

Cost = $28/A

Benefit:Cost = $11/A

Double disk; Nov. fb Select Max; Jan. fb Gramoxone; Feb.

Cost = $44/A

Benefit:Cost = $11/A

Specified Expense = $442/A (MSU Ag Econ. 2012 Corn Budget)

Corn Price = $6.90/bushel
## GR Italian Ryegrass

<table>
<thead>
<tr>
<th>Crop</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>Dual Magnum at 1.33 pt/A or <strong>Zidua at 2.5 oz/A</strong> or double disk</td>
<td>Select Max at 12 to 16 oz/A or equivalent of 2-lb clethodim</td>
<td>One or two applications of paraquat at 0.75 to 1 lb ai/A</td>
</tr>
<tr>
<td>Cotton</td>
<td>Dual Magnum at 1.33 pt/A or Treflan at 3 pt/A or double disk</td>
<td>Select Max at 12 to 16 oz/A or equivalent rate of 2-lb clethodim</td>
<td>One or two applications of paraquat at 0.75 to 1 lb ai/A</td>
</tr>
<tr>
<td>Soybean</td>
<td>Dual Magnum at 1.33 pt/A or Treflan at 3 pt/A or <strong>Boundary at 2 pt/A</strong> or double disk</td>
<td>Select Max at 12 to 16 oz/A or equivalent rate of 2-lb clethodim</td>
<td>One or two applications of paraquat at 0.75 to 1 lb ai/A</td>
</tr>
<tr>
<td>Rice</td>
<td>Command at 2 pt/A or double disk</td>
<td>Select Max at 12 to 16 oz/A or equivalent rate of 2-lb clethodim</td>
<td>One or two applications of paraquat at 0.75 to 1 lb ai/A</td>
</tr>
</tbody>
</table>
Questions?

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