Rice Water Weevil Management Using Current Technology

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LATMC
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~ 40 days/ generation

7 d

25 d

4-9 d

Head
Adults feed & oviposit

Larvae feed, injure roots

Flooding

Weeks since flooding
RWW damage estimate

• If average is 14 RWW larvae per core (2008)
• 1 RWW Larva = 0.5% yield loss
• 14 RWW*0.5% = 7% yield loss

• Average yield in 2008 = 6,100 lbs/acre
• 427 lbs/acre RWW loss
• If $15/hundred-weight
  – $64.05 lost to RWW damage
RWW Control in Verification Fields

Dr. Johnny Saichuk
RWW Control Options

• Cultural
  – Early planting (avoidance)
  – Delay flood (avoidance) – NOT TOO LONG
  – Drain field (rescue)

• Chemical
  – Ovicide – Dimilin 2L (insect growth regulator)
  – Larvicide - Dermacor X-100 (smooth muscle)
  – Adulticide (nerve axon)
    • Pyrethroids (Karate, Mustang Max, Mustang EW)
    • Trebon 3G
# Draining – “Rescue”

<table>
<thead>
<tr>
<th><strong>Pros</strong></th>
<th><strong>Cons</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• No insecticide used</td>
<td>• Unpredictable rain</td>
</tr>
<tr>
<td>• Reduces larval population</td>
<td>• Weed control issues</td>
</tr>
<tr>
<td>– Not always</td>
<td>• Loss of fertilizer</td>
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<tr>
<td>– Don’t know how...</td>
<td>• Stresses plants</td>
</tr>
<tr>
<td>• Inhibits ability to feed</td>
<td>• Delays maturity</td>
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<tr>
<td>• Reapply flood &amp; fertilizer, gives plants a “boost”</td>
<td>• Favorable habitat for blast</td>
</tr>
<tr>
<td></td>
<td>• Hard to time re-flooding</td>
</tr>
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<td></td>
<td>• Increased water use</td>
</tr>
<tr>
<td></td>
<td>• Weevil re-infestation</td>
</tr>
</tbody>
</table>
Drain, assumes $2/gal diesel & 5 inch flood

Drain costs $20/barrel rice.
Adults feed + oviposit

Foliar

Flooding

Weeks since flooding
Pyrethroids & Trebon

• Contact & stomach poison
  – Foliar (Karate or Mustang)
    • Pre-flood
    • Post-flood
    • Pre & post-flood
  – On fertilizer (Mustang)
    • Pre or post-flood
  – Granule (Trebon)
    • Pre or post-flood
    • Near crawfish pond

www.entomology.umn.edu
Trebon is an adulticidal compound.

Trebon will not be effective for 3 weeks after application to field.

Trebon cannot be used as a “rescue” treatment if you miss your pyrethroid spray.
Dimilin 2L - Diflubenzuron

- Insect growth regulator
  - Inhibits chitin synthesis
  - Eggs do not hatch
- Optimally \( \rightarrow \) plant early, delay flood
- Use patterns – see insect control guide

Adults feed + oviposit

Foliar

Flooding

Weeks since flooding
Dermacor™ X-100

Seed

Flooding

Weeks since flooding

Larvae feed, injure roots
Dermacor™ X-100 Seed Treatment

• Section 18
• Certified treaters
  – Crowley Grain
  – G&H Seed Company
  – Angelina Seed Company
• Pending Processors
  – Jimmy Sanders Inc., Tallulah, LA
  – Kennedy Rice Drier, Mer Rouge, LA (Helena)
  – Agro Distribution, LLC, Jones, LA
• Rate of insecticide determined by seeding rate
Dermacor X-100 mode of action

Rynaxypyr™ binds to insect ryanodine receptors in muscle cells causing the channel to open and release calcium ions (Ca^{2+}) from internal stores into the cytoplasm. Depletion of Ca^{2+} stores results in paralysis and death.
Dermacor X-100 Demonstration Trial, 2008

![Graph showing average number of RWW Larvae per core with comparison of untreated, pyrethroid, and Dermacor treated samples.]

- **Untreated**: 9 samples, average 14 larvae/core
- **Pyrethroid**: 2 samples, average 2 larvae/core
- **Dermacor**: 8 samples, average 8 larvae/core

9 Untreated
2 Pyrethroid
8 Dermacor
2008 DuPont™ Dermacor™ X-100 Seed Treatment for Control of Rice Water Weevil – Large Plot Demo. LA. Plant Health Study

- $180/acre profit
- Based on 18.5 cents per lb for rough rice.
- Minus $20/acre Dermacor™ X-100
RWW Insecticide Demonstration Trial, 2009

All same variety, at one location
10-20 acre blocks if possible
Same planting date, or as close as possible
Pre-flood (24hr before flood)
Post-flood (if alone, 2-3d post-flood)
Post-flood following pre (7-10d post-flood)

Locations:
- Acadia
- Concordia
- Evangeline
- Vermillion
Mexican Rice Borer – in La 12/2008

Mexican Rice Borer

Sugarcane borer adult
2008 Louisiana Rice Insects Survey

• Please complete both sides of page
• Your input is greatly needed
• One lucky person will win a hand-lens

2008 Louisiana Rice Insects Survey
January 2008

The purpose of this survey is to determine which insects were the most important pests in Louisiana rice production in 2008. Please answer all questions to the best of your ability. Individual responses will be kept confidential. You can remain anonymous if you prefer. If you have any questions, please contact Natalie Humbal at 253-235-2378 or nhumbal@laextension lsu.edu.

1. Name (optional): ____________________________
2. Phone number (optional): ____________________________
3. E-mail (optional): ____________________________
4. Parish: ____________________________
5. How close you related to rice production? (check all that apply)
   ___ Farmer ___ Consultant ___ Dealer ___ Other (describe): ____________________________
6. How many years have you been involved with rice production?
   ___ 0 ___ 1-5 ___ 6-10 ___ 11-15 ___ 16-20 ___ 21-25 ___ 26-30 ___ 31-35 ___ 36-40 ___ more than 40
7. How many acres of rice did you grow / manage / provide advice on in 2008?
   ___ 0 ___ 1-100 ___ 11-150 ___ 151-200 ___ 201-250 ___ 251-300 ___ 301-500 ___ more than 500
8. What percentage of your rice acreage was planted in a dry seeded (either drill seeded or dry broadcast)?
   ___ 0% ___ 1-25% ___ 25-50% ___ 51-75% ___ 76-100%
9. What percentage of your rice acreage was planted in a Clearedfield variety?
   ___ 0% ___ 1-25% ___ 25-50% ___ 51-75% ___ 76-100%
10. In your rice crop which of the following insects were found in your field(s) in 2008? Please check all that apply and estimate the total number of acres treated in any way (insecticide, flooding to kill insects, delayed planting, etc.).
   ___ Rice Stalk Bug ___ Rice Water Weevil ___ Armyworms ___ Aphids ___ Chick Bug
   ___ estimated acres treated ___ estimated acres treated ___ estimated acres treated ___ estimated acres treated ___ estimated acres treated
Acknowledgements

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County Agents
Glen Daniels
Eddie Eskew
Keith Fontenot
Stuart Gauthier
Ronnie Levy
Keith Normand
Keith Collins
# Seeding rate

<table>
<thead>
<tr>
<th>Seeding rate (seeds per m²)</th>
<th>Number of larvae/pupae per core sample ± s.e.</th>
<th>'Jupiter’ experiment</th>
<th>'Cheniere’ experiment</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>30 d post-flood</td>
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</tr>
<tr>
<td></td>
<td>- Ins.</td>
<td>+ Ins.</td>
<td>- Ins.</td>
</tr>
<tr>
<td>108 – 31%</td>
<td>50.4 ±6.8</td>
<td>11.5±2.2</td>
<td>37.1±5.1</td>
</tr>
<tr>
<td>215 – 67%</td>
<td>45.1±5.6</td>
<td>8.0±1.6</td>
<td>30.9±6.0</td>
</tr>
<tr>
<td>323 – 100%</td>
<td>46.4±5.0</td>
<td>4.0±0.5</td>
<td>27.9±3.3</td>
</tr>
<tr>
<td>430 – 133%</td>
<td>55.8±5.1</td>
<td>3.5±1.1</td>
<td>32.5±3.0</td>
</tr>
<tr>
<td>538 – 167%</td>
<td>45.1±7.1</td>
<td>2.0±0.6</td>
<td>25.6±5.1</td>
</tr>
</tbody>
</table>
• Jupiter & Cheniere
Delayed Flood – “Avoidance”

• 2 weeks after 4 to 5 leaf stage
• Cost is a reduction in optimal fertilizer application and herbicide timing.
• More susceptible to blast
• Flooding causes
  – Enhanced plant growth
  – Increases in foliar nutrients
  – Adults attracted for oviposition
Early Planting – “Avoidance”

• Within range of recommended dates
• Head-start
• Younger plants more susceptible to damage
• Tillering most attractive for oviposition
Factors that increase susceptibility to RWW

• Cultural
  – Late planting
  – Low seeding rate
  – High fertilizer rate

• Water management
  – Water seeding
  – Early flooding of young rice
  – Deep flood
  – Maintaining flood with no insecticide