Stink Bug Thresholds in First and Second Crop and Efficacy of Malathion

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“Rice Insects Information” website

www.lsuagcenter.com/riceinsects

- Information on biology and management
- Pictures
- Links to videos
Insects

Rice insects Information

Rice in Louisiana can be injured by a variety of invertebrate pests; insects and mites. The major invertebrate pests of rice in Louisiana are rice blast weevil and the rice stink bug. In addition, rice saw borers, rice seed midge, the rice leafminer, chinch bugs, bill bugs, sugarcane beetles, the South American rice mite, and armyworms can be important rice pests. Under heavy infestation levels, all of these pests can cause economic losses.

This website contains information about the identification, life cycle, injury to rice and current scouting and management practices for these pests.

Please click on the links located in the box below to obtain information on correct insect scouting, identification, and management practices and additional Rice Integrated Pest Management information.

Rice Insects Information

Rice Insect Fact Sheets

Rice Insect Photo Galleries

Online Rice Pest Identification Guide

Louisiana Rice Insect Blog by Natalie Hummel

Demonstration Tests (coming soon)

Rice Field Notes by Johnny Saichuk

Meetings (Oral and Poster Presentations) (coming soon)

Rice Pest Management Guide & Insecticide Links (coming soon)

Rice Extension Publications (coming soon)

The scouting and management recommendations are based on the best available information and will be modified as additional research is conducted. If you suspect insect injury in your fields, contact your county agent for verification and help with insect management and injury assessment.

The preferred approach to controlling insect pests is by developing and following an integrated pest management plan. Integrated pest management is the integration of a variety of pest control strategies in order to reduce pest populations to a level which is acceptable. This includes the use of crop rotation, crop scouting, and pesticide use along with other tactics to control insect pests.
Rice stink bug: most important late-season insect pest of Louisiana rice

May be most important insect pest in some areas
Your input is needed!
Adult movement – weedy hosts to heading rice

Adults and nymphs feed on developing rice grains
All instars and adults suck out the contents of developing grains.

Bugs may carry pathogens on their mouthparts – partly responsible for pecking.
Rice Stink Bug Damage

Feeding on flowers (non-filled seed)

Remove contents of developing kernels (partially-filled seed)

Pecky rice and broken kernels
Rice stink bug – current management program

• Adults can move into fields rapidly after heading
• Adults are the primary damaging stage
• Thresholds are important – mere presence of stink bugs in a field should not trigger spraying
• Scout with sweep net
Rice stink bug – current management program

• Begin scouting when rice is 50 to 75% heading
• 10 sweeps at 10 different areas
• Avoid hot hours
• First two weeks of heading: 3 bugs per 10 sweeps
• After first two weeks: 10 bugs per 10 sweeps (grains become more resistant as they ripen)
Current Insecticide Options

Pyrethroids
- Karate® Zeon®
- Mustang MAX®
+ others

Organophosphates
- Malathion
- Methyl-Parathion

Carbamate
- Sevin®

Neonicotinoids
- Tenchu
Rice stink bug management program

- Loss/lack of efficacy of older insecticides
- Introduction of new insecticides
- Reevaluation of damage and thresholds
- Other management tactics
Methyl parathion in rice

EPA has received requests from the registrants to voluntarily cancel all product registrations containing methyl parathion, a restricted use organophosphate insecticide and acaricide used primarily on cotton, corn, and rice, as well as on other agricultural crops. These requests would terminate the last methyl parathion products registered for use in the U.S., effective December 31, 2012. End-use products will not be sold after August 31, 2013, and end-use products cannot legally be used after December 31, 2013. All end use product labels will be amended to reflect the last legal use date.
# Malathion efficacy – two trials, 2012

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean RSB in 10 Sweeps for three sampling dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated Control</td>
<td>6.63 ± 3.03AB</td>
</tr>
<tr>
<td>Karate Z, 0.04 lbs ai/acre</td>
<td>3.96 ± 2.82B</td>
</tr>
<tr>
<td>Malathion, 0.9 lbs ai/acre</td>
<td>6.75 ± 4.10A</td>
</tr>
<tr>
<td>Tenchu 20SG, 9.0 oz ai/acre</td>
<td>5.83 ± 4.81AB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1 DAT</th>
<th>3-4 DAT</th>
<th>6 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated Control</td>
<td>7.13 ± 0.90</td>
<td>6.63 ± 1.27</td>
<td>6.13 ± 1.14</td>
</tr>
<tr>
<td>Karate Z, 0.04 lbs ai/acre</td>
<td>3.25 ± 0.90</td>
<td>4.00 ± 1.30</td>
<td>4.63 ± 0.80</td>
</tr>
<tr>
<td>Malathion, 0.9 lbs ai/acre</td>
<td>7.13 ± 1.33</td>
<td>5.63 ± 1.31</td>
<td>7.50 ± 1.77</td>
</tr>
<tr>
<td>Tenchu 20SG, 9.0 oz ai/acre</td>
<td>5.00 ± 2.04</td>
<td>5.88 ± 1.67</td>
<td>6.63 ± 1.54</td>
</tr>
</tbody>
</table>
Rice stink bug management program

- Loss/efficacy of older insecticides
- Introduction of new insecticides
- Reevaluation of damage and thresholds
- Other management tactics
Tenchu 20 SG label

- LX434 Dinotefuran 20SG
- Rate: 7.5 to 10.5 oz. product per Acre (0.094-0.131 lbs ai per Acre)
- Labeled only for rice stink bug in rice
- Maximum of two applications per year
- 7 d phi
- Crawfish restrictions
- Waiting on state label
Fastac label

- Active ingredient: alpha-cypermethrin (pyrethroid)
- Rate: 2.6 to 3.8 fl oz/acre (0.02-0.025 lb ai/acre)
- Use like other pyrethroids
- Do not apply > 11.4 fl oz/acre/year
- “Do not use treated rice fields for the aquaculture ...”
- Rice water weevil, aphids, armyworms, stink bugs
2011 Small Plot Insecticide Efficacy

Treatments

Control
Endigo 2.06
Tenchu
Centric
Endigo 2CX
Karate

1DAT
2DAT
5DAT

RSB Adults / 10 Sweeps

0
5
10
15
20
25
30
35
2011 Small Plot Insecticide Efficacy

Nymphs / 10 Sweeps

Treatments

Control  Endigo 2.06  Tenchu  Centric  Endigo 2CX  Karate

1DAT  2DAT  5DAT
Percent reduction in RSB numbers - 24hr before treatment vs. 48hr after treatment.
Percent pecky rice by treatment (Pyrethroid- yellow, Tenchu 20 SG- Blue) at each location.
Rice stink bug management program

• Loss/efficacy of older insecticides
• Introduction of new insecticides
• Reevaluation of damage and thresholds
• Other management tactics

Your input is needed!
Why re-evaluate application thresholds?

- Origins of current thresholds unknown
- Recent results from TX suggest thresholds may be too low – spraying too much?
- New insecticides, varieties

First step: re-evaluate relationship between stink bug density and damage (peck, blanks)
Rice Stink Bug Cage Studies
Cage Study

Beginning: Plant 5 Plots of Cocodrie

Install Cages at First Sign of Emergence

Infest with 0, 2, 5, 10, or 20 RSB Adults
Sweep net sampling efficiency

\[ y = 0.1634x \]

\[ R^2 = 0.5852 \]
- Recapture rate is 16%
- Early LA threshold is 0.3 RSB per sweep (= 3 RSB per 10 sweeps)
- So, threshold of 0.3/sweep is equivalent to 1.88 bugs actually present in the sweep radius
RSB Cage Study

- Cages are 6.67 sq. ft
- Recommended sweep covers approximately 9.5 sq. ft.
- Cage area is 70% of 1 sweep
RSB Cage Study

- 3 RSB per 10 sweeps equates to 1.313 RSB per cage

- 2010-Cage Study 4 reps w/ 0, 1, 2, 5, or 10 bugs per cage

- 2011 & 2012- 4 reps each year w/ 0, 2, 5, 10, 20 bugs per cage
Cage Study

Beginning: Plant 5 Plots of Cocodrie

- Count Panicles Harvested
- Hand Thresh and Weigh Rough Rice

Install Cages at First Sign of Emergence

- Harvest Entire Cage
- Separate Blank Hulls and Weigh

Infest with 0, 2, 5, 10, or 20 RSB Adults

- Spray Twice Weekly Until Grain Hardening
- Shell 100 gm and Calculate % Pecky Rice due to RSB

Remove Cages After 14 Days

Result: Correlate % Pecky Rice with RSB per 10 Sweeps
$y = 0.0483x + 3.0472$

$R^2 = 0.691$

2010 and 2011

% Peck in unpolished rice, broken and whole grains
Threshold development

- Statistical analysis
- Relate damage (peck, blanks) to economic losses (yield loss, penalties for peck)
- Adjust for rice prices, insecticide costs, etc. to obtain economic threshold
- Verification
- Expect preliminary answers by June (training session?)
Rice stink bug management program

• Loss/efficacy of older insecticides
• Introduction of new insecticides
• Reevaluation of damage and thresholds
• Other management tactics
Adult movement – weedy hosts to heading rice

Nymphs develop on ripening grains
Unanswered questions – rice stink bug biology

• What causes adult stink bugs to move in and out of fields (nymphs cannot fly)?

• How much damage do nymphs cause?
  --do immature stink bugs develop rapidly enough to cause economic injury to developing rice grains?

• How much impact do natural enemies have?
Questions or feedback?

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