Coragen® for Control of Key Pests in Sugarcane

Michael T. Edwards
DuPont Crop Protection
1014 Belle River Rd
Pierre Part, LA 70339

(225) 264-0413 - Office and Cell
(866) 385-7464 - Fax
Michael.T.Edwards@usa.dupont.com

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Rynaxypyr® Technical Info and Formulations

- Chemical name – Chlorantraniliprole
  - Group 28 Insecticide - Ryanodine receptor modulators

- Rynaxypyr® is labeled on more than 400 crops

- Currently sold as:
  - Coragen®: 1.67 lb ai/gal suspension concentrate
    - Primarily vegetables and row crops
    - Labeled for Sugarcane in 2010
  - Altacor®: 35 % water-dispersible granules
    - Primarily fruit
  - Dermacor® X-100: 5.21 lb ai/gal suspension concentrate
    - Seed treatment formulation

- Excellent Toxicology - Applicator PPE:
  - Long-sleeved shirt and long pants.
  - Shoes plus socks.
Effective and Uniquely Broad Spectrum

**Lepidoptera**
- Sugarcane Borer
- Mexican Rice Borer
- Armyworms (beet, southern, fall, western yellowstriped)
- Tobacco budworm
- Cotton Bollworm
- Saltmarsh caterpillar
- Cabbage looper
- Soybean looper*
- Tomato fruitworm & pinworm
- Hornworms
- Webworms
- Potato tuberworm
- Diamondback moth
- Imported cabbageworm
- European corn borer
- Melonworm, Pickleworm
- Cutworms
- Rice stem borers

**Others**
- Colorado potato beetle
- Rice water weevil
- ** Pepper weevil
- ** Serpentine vegetable leafminer
- ** Whiteflies

**Best Performance with applied via soil

* Suppression

3/24/2011
Insect Poisoning Symptoms

Primary route of exposure - Ingestion

- Rapid feeding cessation
- General lethargy
- Regurgitation
- Muscle paralysis
- Death within 72 hrs

Photos: R. Armstrong, Delaware, USA
High Larvicidal Potency by Ingestion

Potency by Ingestion of Rynaxypyr® vs. Standards
Feeding bioassay against 3rd instar larvae on cotton

**H. virescens**

<table>
<thead>
<tr>
<th>Treatment</th>
<th><strong>LC&lt;sub&gt;50&lt;/sub&gt; (ppm)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cypermethrin</td>
<td>13.5&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Indoxacarb (Steward®)</td>
<td>1.5&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Rynaxypyr®</td>
<td>0.1&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Data: DuPont Stine Research - C. Clark, Delaware, USA
Two blocks of cotton plants received a single foliar application at 30 g ai/ha.

One of the blocks of plants was protected from natural rain by a plastic tunnel.

At 28 days after the treatment, leaves were collected at random from the treated blocks and used in a laboratory feeding bioassay against 3rd instar Fall Armyworm larvae.

Larval mortality resulting from exposure to these aged leaf residues was evaluated 96 hours post-exposure.

Data and photos: M. Lima & F. Andrade, São Paulo, Brazil
Cotton Rainfastness and Residual Activity Field Study, Paulínia – São Paulo, Brazil

% Mortality of 3rd instar *S. frugiperda* larvae (28 days after single foliar application)

More than 95% larval mortality at 28 days after a total of 6.5 in of accumulated rain.

Coragen® 20SC at 30 g ai/ha

Data and photos: M. Lima & F. Andrade, São Paulo, Brazil
Ovicidal vs. Ovi-Larvicidal Activity against *Heliothis virescens* – Comparison with the standard Methomyl

Comparative effect of Coragen® vs. Lannate® upon eggs of *Heliothis virescens*

**Ovicidal activity of Methomyl at 125 g ai/100 L.** Embryo is killed within the egg → larvae do not develop and do not hatch.

**Ovi-larvicidal activity of Rynaxypyr® 20 SC at 7.5 g ai/100 L.** Neonate is exposed to residues on the outer surface of the egg membrane and dies rapidly.

*Photos: M. Lima, Paulínia, Brazil*
Biological Features
Materials and Methods

- 4 trials from 2008 – 2010
- 2 States = Louisiana, Texas
- Majority of trials 3 - 4 replicates
- Majority 15 – 60 PSI and 20-40 GPA
- Tractor Mounted Sprayers

Data: DuPont and University trials 2002 - 2010
Performance against *Borers in Sugarcane*
Combined Sugarcane and Mexican Rice borer data

Data: DuPont and University trials 2002 - 2010
Label DFU
February 2010
<table>
<thead>
<tr>
<th>Crop</th>
<th>Application Method</th>
<th>Target Pest</th>
<th>DUPONT™ CORAGEN® RATE</th>
<th>Last Application (Days to Harvest)</th>
<th>REI (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugarcane</td>
<td>FOLIAR</td>
<td>Sugarcane borer</td>
<td>Lb. ai per acre</td>
<td>fluid ounces product per acre</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>0.045-0.065</td>
<td>3.5 - 5.0</td>
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Make no more than 4 applications per acre per crop. Minimum interval between treatments is 7 days. Do not apply more than 15.4 fl oz CORAGEN® or 0.2 lbs a.i. of chlorantraniliprole containing products per acre per crop.
DuPont Coragen®

In a nutshell ....

- Novel mode of action
- Favorable Toxicological and Eco-toxicological profile
- Long-lasting
- Broad Spectrum
- Excellent crop safety
- Soft on beneficial arthropods
- Excellent fit into IPM and IRM Programs