DuPont™ Lumiderm™
insecticide seed treatment
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Insecticide seed treatment

What is Lumiderm™ Seed Treatment?

• A new mode of action insecticide
• Active ingredient – Cyantraniliprole
• Group 28 insecticide

Standard

Lumiderm™
Rynaxypyr® impacts insect behavior by impairing muscle function (release of Ca++), which causes muscle paralysis & death
Mammalian Toxicology

<table>
<thead>
<tr>
<th>REPRESENTATIVE TEST</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute oral toxicity, rat LC&lt;sub&gt;50&lt;/sub&gt;:</td>
<td>&gt; 5,000 mg/ kg</td>
</tr>
<tr>
<td>Acute dermal toxicity, rat LD&lt;sub&gt;50&lt;/sub&gt;:</td>
<td>&gt; 5,000 mg/ kg</td>
</tr>
<tr>
<td>Sub-acute and subchronic toxicity (mouse, rat, dog):</td>
<td>No adverse effects</td>
</tr>
<tr>
<td>Inhalation, rat LC&lt;sub&gt;50&lt;/sub&gt;:</td>
<td>&gt; 5.1 mg/ L</td>
</tr>
<tr>
<td>Dermal irritation:</td>
<td>Not irritant</td>
</tr>
<tr>
<td>Eye irritation:</td>
<td>Slight, clearing in 72 hours</td>
</tr>
<tr>
<td>Dermal sensitization:</td>
<td>Not a sensitizer</td>
</tr>
<tr>
<td>Mutagenicity:</td>
<td>Not mutagenic</td>
</tr>
<tr>
<td>Carcinogenicity:</td>
<td>Not carcinogenic</td>
</tr>
<tr>
<td>Neurotoxicity:</td>
<td>Not neurotoxic</td>
</tr>
<tr>
<td>Immunotoxicity:</td>
<td>Not immunotoxic</td>
</tr>
<tr>
<td>Developmental toxicity:</td>
<td>No adverse effects</td>
</tr>
<tr>
<td>Reproductive toxicity:</td>
<td>No adverse effects</td>
</tr>
</tbody>
</table>

All regulatory toxicology studies have shown low toxicity to mammals, as low or lower than any other synthetic insecticides.
Product Concept

- **Lumiderm™ + Standard Seed Treatments are highly complementary**
  - Enhanced protection against both crucifer and striped flea beetles
  - New product functionality for protection against early season cutworms (lepidoptera)
  - Improved early season stand establishment & vigor of canola
  - Residual Control – up to 35 days protection from flea beetles & cutworms
  - Consistent Performance in Wide Range of Environmental Conditions

### Soil Conditions:

- **“Dry”**
- **“Normal”**
- **“Moist”**

**Standards**

Better performance

**Lumiderm™**

Better performance
**FLEA BEETLE CONTROL**

- Enhanced protection against both crucifer and striped flea beetles

![Crucifer](image1.png)  ![Striped](image2.png)
Untreated VS Lumiderm™ + Standard

Flee Beetle: Extremely HIGH Pressure - Crucifer
22 Days after seeding. Carman, MB
Standard VS Lumiderm™+Standard

Flee Beetle: Extremely HIGH Pressure - Crucifer
22 Days after seeding. Carman, MB

Standard

Lumiderm™ + Standard
WHAT DOES “Enhanced protection against striped flea beetles” LOOK LIKE?

**Striped Flea Beetle Damage**

<table>
<thead>
<tr>
<th>% Damage</th>
<th>Standard</th>
<th>LumidermTM + Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td></td>
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</tbody>
</table>

Source: University of Alberta, Dr. A. Keddie, 2-year Lab/Greenhouse Testing

33% less striped flea beetle damage
CUTWORM CONTROL

New product functionality for protection against cutworms
Lumiderm™+ Standard VS Standard

40 Days after seeding
New Norway Site, AB
Cutworm – Time Lapse Photography
DuPont – Stine-Haskell Research Centre – Wilmington, DE

- 24 canola cotyledons per tray
- Cutworm larvae were introduced at 2 per plant.
- The equivalent of 100 cutworms per square meter.
- This is 25 to 30 TIMES the economic threshold of 3 to 4 cutworms per square meter as identified by the Canola Council of Canada.

Standard  Standard + Lumiderm™
At 6 days post-infestation, none of the plants with the standard treatment have survived, while the majority of Lumiderm™-treated plants are still present and growing strong.
Seedling Vigor

Average Seedling Vigor

N= 115

8% higher vigor ratings
Plant Count

Average Seedling Count

12% higher seedling counts

N= 126
Flea Beetle Damage

29% less flea beetle damage

N= 112
MB had extremely high & prolonged pressure of Flea Beetles in 2013.
Thank You!

Questions / Comments?