FLUTIANIL
Fungicide
Product name: GATTEN®

OAT Agrio Co., Ltd.
—Tokyo, Japan—

2018 IR-4 Food Use Workshop
Flutianil, Characteristics

- New chemical group: cyano-methylene thiazolidine
- Effective in controlling powdery mildew
- **Novel Mode of Action against powdery mildew**
  (FRAC Code U13)
- No Cross-Resistance with other chemical classes
Regulatory Information

- **US**
  - Reduced risk status granted for all of the registered crops
  - Approval: Registration granted March 2018
  - Registered crops: Apple, Cantaloupe, Cherry, Cucumber, Grape, Squash, and Strawberry. Anticipated label expansion: Cucurbitis group and Hops

- **Canada**
  - Pre-submission discussions with PMRA ongoing. Submission planned soon

- **Japan**
  - Registered on Eggplant, Cucumber, Pumpkin and Squash, Watermelon, Melons, Strawberry, Zucchini, Tomato, Peas, Flowers and Ornamental plants, and Trees and Shrubs.

- **Korea**
  - Registered on Green & Red pepper (Fresh), Strawberry, Watermelon, Cucumber, Korean melon, and Sweet pepper

- **EU**
  - Under evaluation
  - Anticipated registration in 2018
  - Proposed crops: Grapes and Flowers and Ornamental plants
US Label

- **Type:** Fungicide
- **Product Name:** GATTEN®
- **Active ingredient:** Flutianil
- **Formulation:** 5% EC
- **Use rate:** 0.04 lb ai/acre (0.01-0.05 lb ai/acre global)
  - **Note:** 0.01 – 0.02 lb ai/A is new targeted use rate in US
- **Application:** 4-5 times per season, 7 day interval
- **PHI:** 0-14 days
- **Crops:** Apple, Cantaloupe, Cherry, Cucumber, Grape, Squash, and Strawberry
  - **All granted reduced risk status**
US Label Expansion

- Cucurbit Crop Group
- Hops
- Mustard Greens (possible)
- Current IR-4 Studies – Lettuce (incl. GH), Peach, Cucumber (GH part of GMUS) and possibly Rosemary and Sage (IR-4 efficacy studies on-going)
- All studies completed and ready to submit except for IR-4 on-going studies
Cherry, hops and greenhouse pepper (2019)

Greenhouse tomato efficacy study done in 2017

Use rate: 4 times/7 day interval 0.01 and 0.02 lb ai/acre (targeted label use rate)

Results:

at 0.01 or 0.02 lb a.i./acre flutianil controlled powdery mildew of greenhouse tomato very well in the trial in 2017.

Under moderate disease pressure, GATTEN 5% (flutianil) reduced leaf area diseased by 70-90% compared to the check and was similar to NOVA, up to 21 days after the last application.

There was no difference between the 0.01 or 0.02 lb a.i. rates. No phytotoxicity on foliage, flowers or fruit.
The 1.2-leaf stages of cucumber plants that were inoculated with *Podosphaera xanthii* 7 d before a flutianil application were observed in a low-temperature cryofixation electron microscope.

The 1.2-leaf stages of barley that were inoculated with *Blumeria grainis* f.sp. *hordei* 7 days before a flutainil application and stained with lactophenol trypan blue, at 3 d after fungicide application and observed under a microscope. Bars=50 µm.
Novel Mode of Action

The 1.2-leaf stages of barley that were inoculated with *B. grainis f.sp. hordei* 7 days before a flutainil application and stained with DAPI or rhodamine phalloidin, at 3 d after fungicide application and observed under a microscope.
Erysiphe necator on Chardonnay Grape

Effective at Low Dose

<table>
<thead>
<tr>
<th></th>
<th>Leaves (0.01 lb ai/acre)</th>
<th>Leaves (0.02 lb ai/acre)</th>
<th>Leaves (0.04 lb ai/acre)</th>
<th>A fungicide (0.06 lb ai/acre)</th>
<th>B fungicide (0.11 lb ai/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Value</td>
<td>100</td>
<td>90</td>
<td>80</td>
<td>95</td>
<td>100</td>
</tr>
</tbody>
</table>

- Location: Italy
- Four applications, targeted for every 10 days until color change
- Assessment was determined at 11 (leaves) and 10 (bunches) days after the last application
**Erysiphe necator** on Tempranillo Grape

**Effective at Low Dose**

- Location: Spain
- Four applications made every 7-10 days. Applications were started late in the season when bunches were already formed.
- Assessment was determined at 12 (leaves) and 8 (bunches) days after the last application
**Podosphaera xanthii** on Leaves of Yellow Squash

**Effective at Low Dose**

<table>
<thead>
<tr>
<th>Control value</th>
<th>Flutianil (0.01 lb ai/acre)</th>
<th>Flutianil (0.02 lb ai/acre)</th>
<th>Flutianil (0.04 lb ai/acre)</th>
<th>A fungicide (0.10 lb ai/acre)</th>
<th>C fungicide (0.25 lb ai/acre)</th>
</tr>
</thead>
</table>

- Location: Raleigh, NC
- Five applications targeted at 7 days intervals
- Assessment was determined at 7 days after the last application
Sphaerotheca fuliginea on Squash

0.03 lb ai/acre Flutianil

untreated

- Location: Tokushima, Japan, OAT AGRIO
- One application targeted, Assessment was determined at 25 days after application
- Application: 1 - 6/18/2012
Thank you

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—Tokyo, Japan—