

# FLUTIANIL

## Fungicide

### Product name: GATTEN<sup>®</sup>

The logo consists of a stylized blue 'A' with a green swoosh underneath it, followed by the text 'OAT' in blue and a green heart symbol.

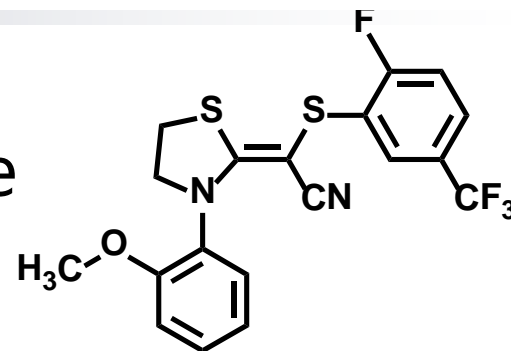
OAT Agrio Co., Ltd.

—Tokyo, Japan—

**2017 IR-4 Food Use Workshop, September, 2017**

# 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**



## ■ US

- Reduced risk status granted for all of the proposed crops.
- Anticipated approval: 2017
- Proposed crops: Apple, Cantaloupe, Cherry, Cucumber, Grape, Squash, and Strawberry

## ■ Japan

- Registered on Eggplant, Cucumber, Pumpkin and Squash, Watermelon, Melons, Strawberry, and Flowers and Ornamental plants

## ■ Korea

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

## ■ EU

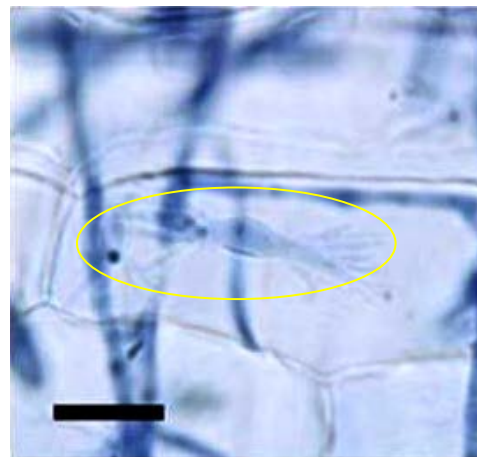
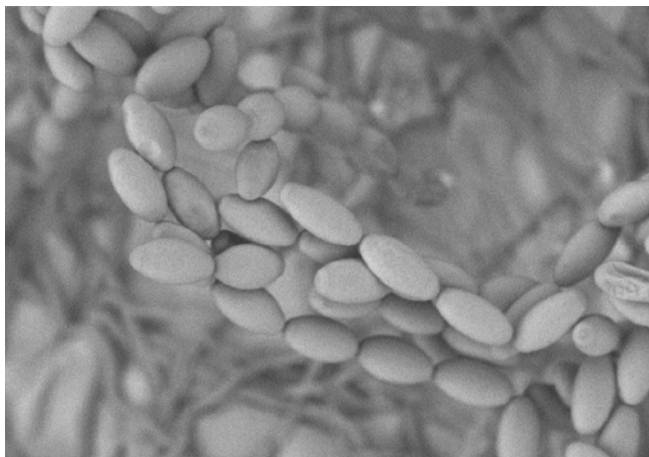
- Under evaluation
- Anticipated registration in 2017
- Proposed crops: Grapes and Flowers and Ornamental plants

# US Label (proposed)

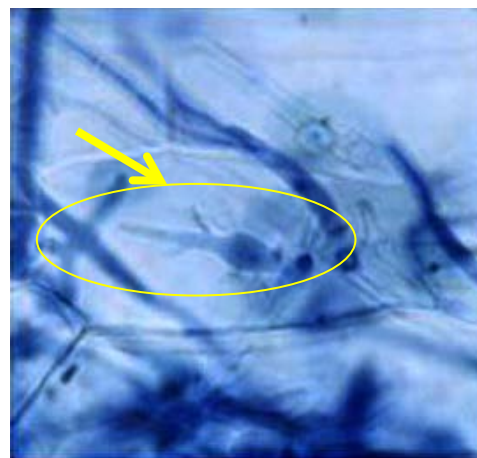
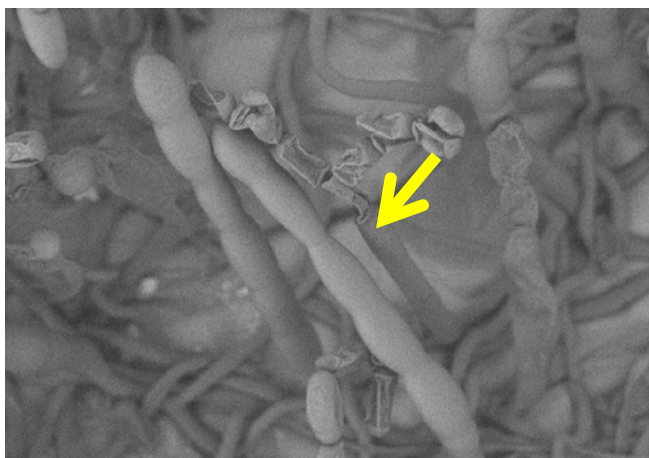
- **Type:** Fungicide
- **Product Name:** GATTEN<sup>®</sup>
- **Active ingredient:** Flutianil
- **Formulation:** 5% EC
- **Use rate:** 0.04 lb ai/acre (0.01-0.05 lb ai/acre global)
  - **Note: 0.01 – 0.02 lb ai/A is new targeted use rate in US**
- **Application:** 4-5 times per season, 7 day interval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

# Novel Mode of Action

untreated



10 mg/L  
Flutianil



**Inhibition of  
haustorial  
formation, and  
sporulation**

Conidiophores

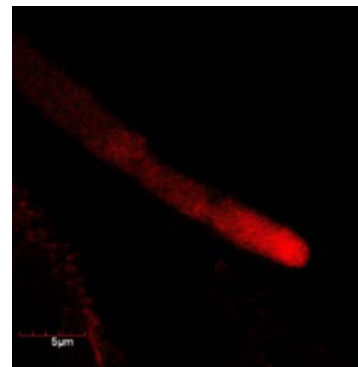
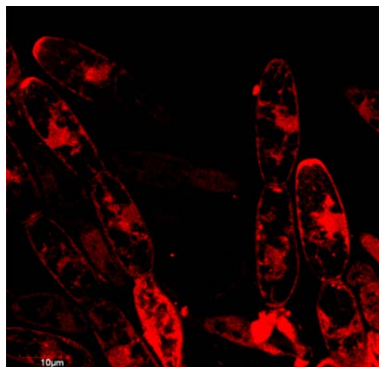
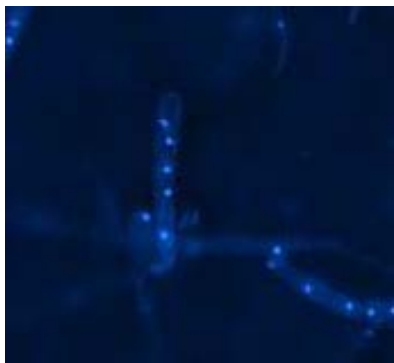
The 1.2-leaf stages of cucumber plants that were inoculated with *Podosphaera xanthii* 7 d before a flutianil application were observed in a low-temperature cryofixation electron microscope

Haustrorium

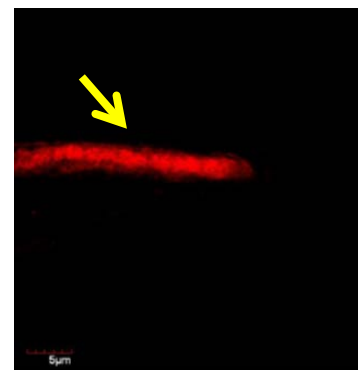
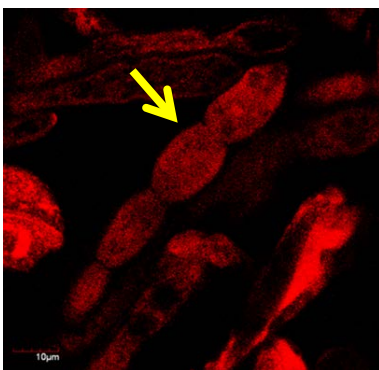
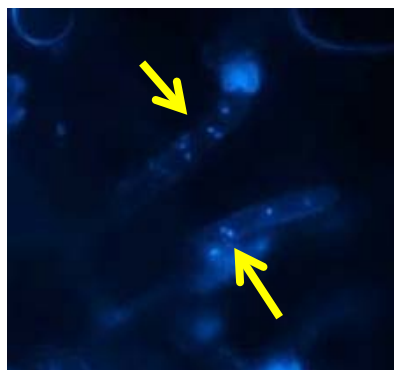
The 1.2-leaf stages of barley that were inoculated with *Blumeria grainis* f.sp. *hordei* 7 days before a flutainil application and stained with lactophenol trypan blue, at 3 d after fungicide application and observed under a microscope. Bars=50  $\mu$ m

# Novel Mode of Action

untreated



10 mg/L  
Flutianil



**Actin disruption  
and abnormal  
nuclei were  
observed**

conidiophores

Nuclei  
distribution

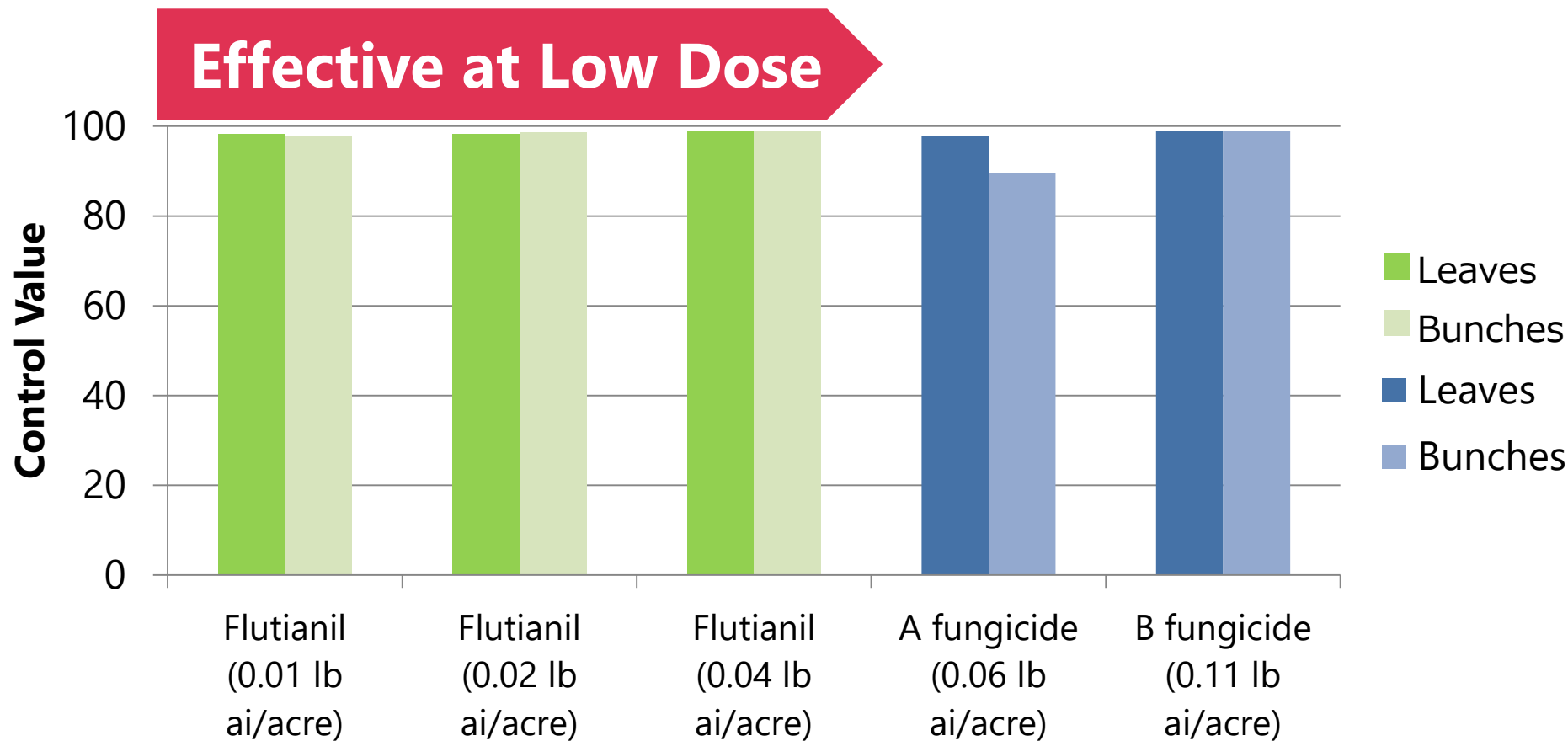
conidiophores

Actin organization

Hyphae

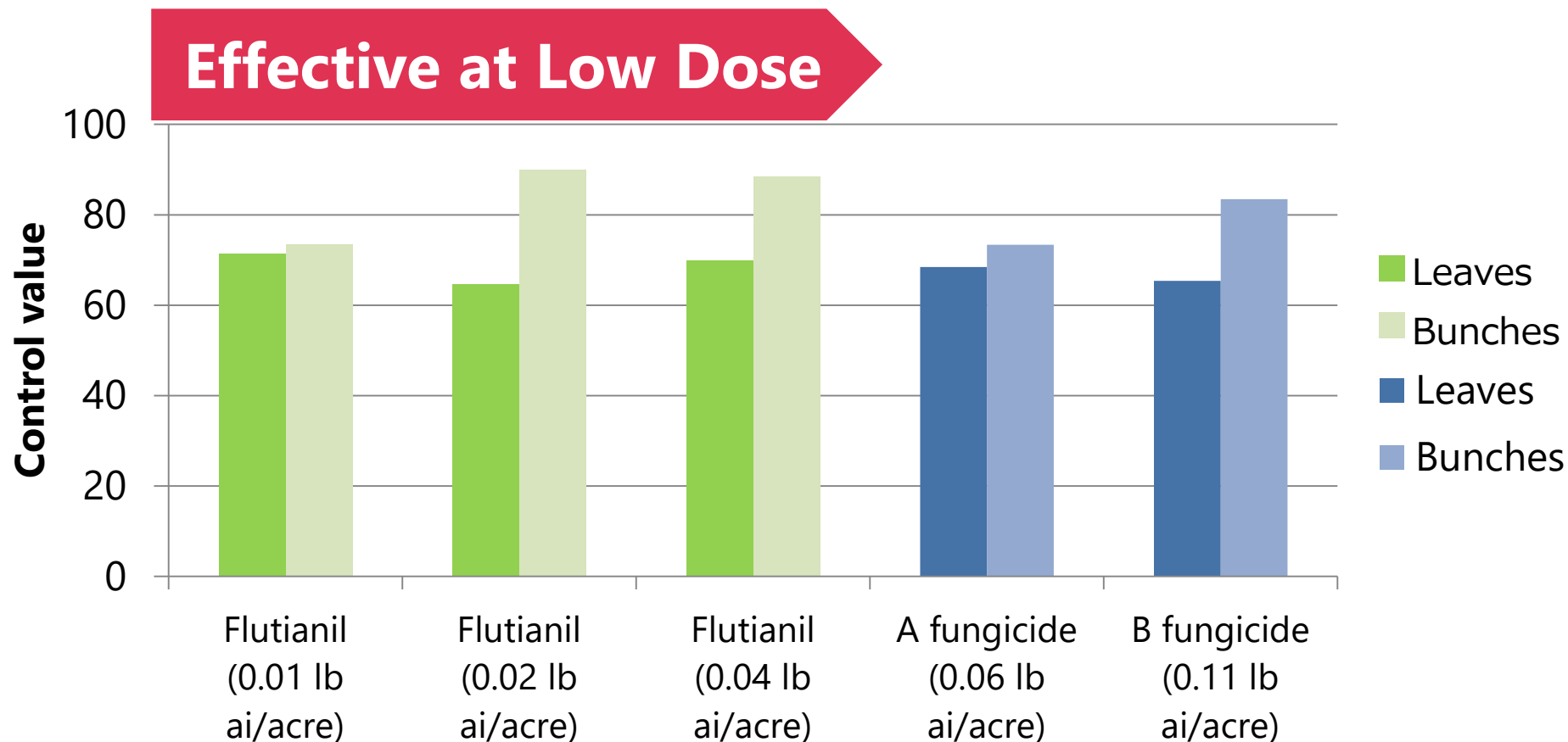
The 1.2-leaf stages of barley that were inoculated with *B. grainis* f.sp. *hordei* 7 days before a flutianil application and stained with DAPI or rhodaine phalloidin, at 3 d after fungicide application and observed under a microscope.

# *Erysiphe necator* on Chardonnay Grape



- 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
- Application: 1 – 6/28/11, 2 – 7/9/11, 3 – 7/20/11, 4 – 7/31/11

# *Erysiphe necator* on Tempranillo Grape

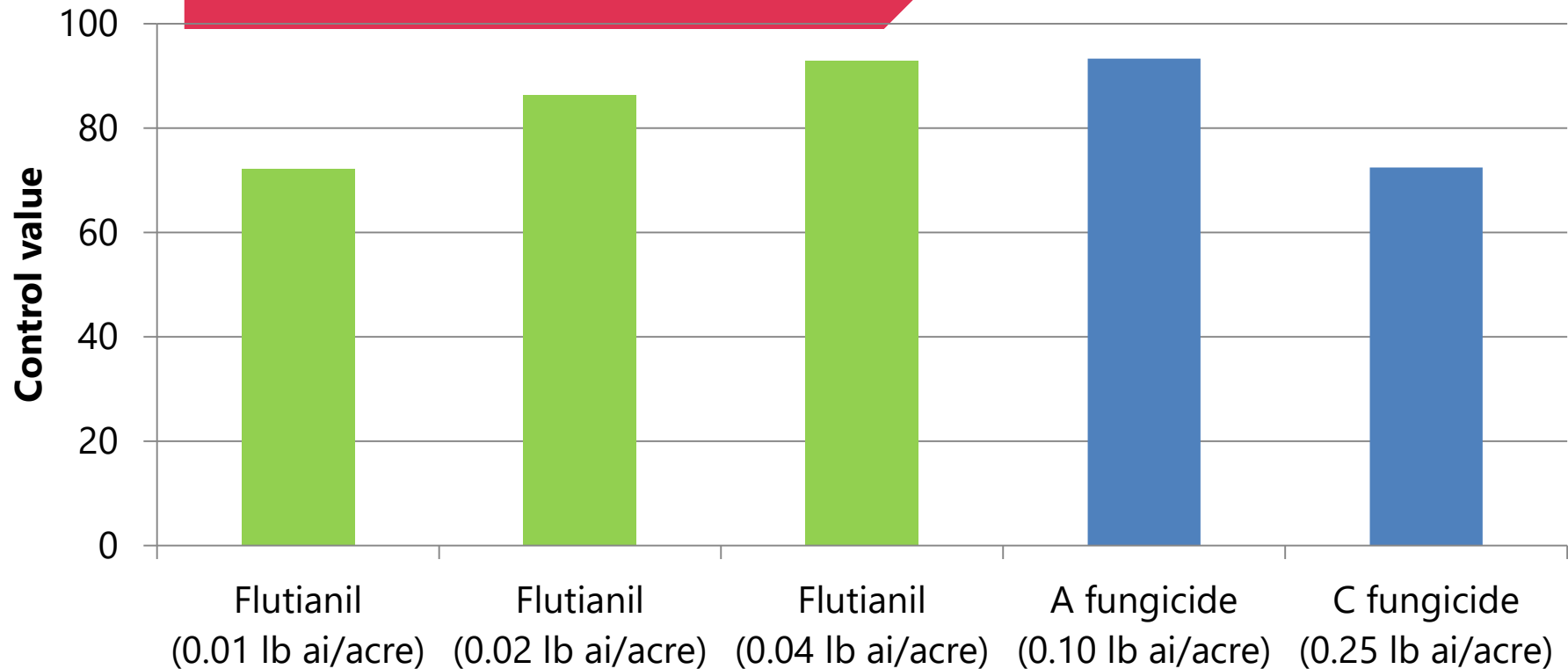


- Location: Spain
- Four applications made every 7-10 days. Applications were started late in the season when bunches were already formed.
- Assessment was determined at 12 (leaves) and 8 (bunches) days after the last application
- Application: 1 – 7/7/11, 2 – 7/15/11, 3 – 7/27/11 and 4 – 8/4/11



# *Podosphaera xanthii* on Leaves of Yellow Squash

**Effective at Low Dose**



- Location: Raleigh, NC
- Five applications targeted at 7 days intervals
- Assessment was determined at 7 days after the last application
- Application: 1 - 7/27/2011, 2 - 8/3/2011, 3 - 8/10/2011, 4 - 8/17/2011, 5 - 8/24/2011

# Tomato GH Efficacy in Canada

- **Study done this year**
- **Dr. Janice Elmhirst - Canada**
- **Formulation:** 5% EC
- **Use rate:** 0.01 and 0.02 lb ai/acre (new targeted label use rate)
- **Application:** 4 times at a 7 day interval
  
- **Results:**
  - *at 0.01 or 0.02 lb a.i./acre flutianil controlled powdery mildew of greenhouse tomato very well in the trial this year.*
  - *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.*
  - **NOTE!** – *Flutianil has been granted reduced risk status and is novel mode of action for resistance management (FRAC U-13)*

# *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



OAT Agrio Co., Ltd.

—Tokyo, Japan—

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