BASF

We create chemistry

CTGA Product Update
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Priaxxor Fungicide
Xemium® Brand

_F500® Fungicide
the active ingredient in:

Pristine®
Fungicide

Cabrio® EG
Fungicide

| Priaxxor®
Xemium® Brand Fungicide |
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td><strong>Formulation:</strong></td>
</tr>
<tr>
<td>2:1 F500 + Xemium</td>
</tr>
<tr>
<td><strong>Registered Crops:</strong></td>
</tr>
<tr>
<td>Fruit ing vegetables, tuberous vegetables, Brassicas</td>
</tr>
</tbody>
</table>

Xemium → fluxapyroxad
- Carboxamide (FRAC 7)
- Unique redistribution of A.I.
  - Broad spectrum
  - Long residual control
## Priaxor® Fungicide Use in Tomatoes

<table>
<thead>
<tr>
<th>Use Rates and Diseases</th>
<th>Diseases</th>
</tr>
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<tbody>
<tr>
<td>4-8 oz/A</td>
<td>Anthracnose, Black mold, Early blight, Septoria leaf spot and Target spot</td>
</tr>
<tr>
<td>6-8 oz/A</td>
<td>Powdery mildew</td>
</tr>
<tr>
<td>4-8 oz/A</td>
<td>Suppression of Botrytis, Rhizoctonia stem rot, Sclerotinia stem rot, White mold, Southern blight, Late blight</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PHI</th>
<th>REI</th>
<th>12 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 days</td>
<td></td>
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</table>

### Adjuvant Use and Tank Mixing With Priaxor
- Always consult a BASF representative before tank mixing products with Priaxor
- Effectiveness and safety of Priaxor in mixes depends on product, growth stage and other factors
Priaxor Fungicide
Tomato, Powdery Mildew, Efficacy
2015 Tom Turini – UCCE Fresno County, CA

2015 Tom Turini – Univ. of California West side Ag Research, Five Points, CA. RCBD. Disease was rated on a 0 to 10 scale, where 0 = no visible symptoms and 10 was completely covered with powdery mildew or obvious symptoms. Applications made on 7, 19 and 31 Aug at 50 gallons per A with a CO2-pressurized backpack sprayer at 32 psi. Processing tomato variety: Sun 6366
Vivando® Fungicide
New Crop Use for Tomato

- CA supplemental label for fruiting vegetables in 2015
- Active ingredient = metrafenone
- Highly specific fungicidal activity – only powdery mildew fungi
- Totally unique chemistry and mode of action
  - FRAC MoA Group Code U8
Vivando™ Fungicide
Affects Many Life Stages of Powdery Mildew

Before Infection: Stops Penetration

Vivando is most effective at stopping infections.

Deformed Appressoria Can’t Penetrate the Plant

After Infection: Limits Sporulation

Vivando limits but doesn’t burn out lesions.

Vivando limits but doesn’t burn out lesions.

Vivando limits but doesn’t burn out lesions.

Vivando is NOT curative

After Infection: Limits Lesion Growth

Vivando limits but doesn’t burn out lesions.

Hyphal Tips Burst
Irregular Branching
Development Interrupted

Vivando Always Recommended as Preventive Application
Vivando Fungicide
Tomato, Powdery Mildew, Efficacy
2015 Scott Stoddard – UCCE Merced County, CA

2015 Scott Stoddard – location: Merced College, Merced, CA. RCBD. Severity scores based on a 1 - 5 scale: 0 = no visible colonies, 1 = <10% leaf infected, 2 = 25%, 3 = 50%, 4 = 75%, 5 = > 90% leaf infected. Incidence based on 10 random leaves per plot. Applications made on Aug 28 and Sept 22 at 80 gallons per A with a CO₂-pressurized backpack sprayer at 35 psi. Processing tomato variety: QualiT-27
Vivando® Fungicide
Directions for Use in Fruiting Vegetables

- Suggested use: at bloom, rotation with Priaxor, or tank mix partner (Rally)

- Single Use Rate: 15.4 fl oz/Acre

- Application Timing
  - Apply preventively for best performance
  - 0-day PHI
  - < 2 sequential sprays then change MoA

- Adjuvants
  - Organo-silicone adjuvants recommended
  - DO NOT mix with horticultural oils
California Tomato Growers Association

The Bayer Portfolio:
Serenade Soil®
Admire Pro®
Belt®
Oberon®
Sivanto®
Luna Sensation®
Velum Prime®
Bacillus subtilis is known to have many positive interactions with plants as part of a natural system benefiting both sides. However, the strain within Serenade, Bacillus subtilis QST713, is unique in several ways.

**Plant Microbe interactions**

- **Root Colonization:**
  Serenade is an excellent root colonizer. When used as a soil treatment, it can be a pre-emptive colonizer of the plant’s rhizome, forming a protective barrier to protect against soil diseases. Soil applications of Serenade result in colonization of the plant roots which can continue as the roots grow. Serenade can improve plant health by producing auxins, such as 2,3-butanediol and indole acetic acid to speed early season growth. In the laboratory in Arabidopsis, Serenade has been shown to trigger the sucrose pathway inside the plant showing a mutualistic relationship where the plant is supporting the colonization.

- **Nutrient Solubilization:**
  Serenade produces a siderophore, bacillibactin, which complexes iron to benefit the plant. Serenade also produces the enzymes endoglucanase and endoxylanase which hydrolyze cellulose and xylan, breaking down organic material in the soil to forms which are more easily taken up by plant roots.
The Reasons for

Increased dispersion & suspension
Reduced foam formulation
Concentrated formulation (42.8% ai)
Unique “blue” color
  • Easy to see
  • Cleans without leaving residues

Early season control of aphids and thrips

Use Pattern:
Soil application via chemigation, post- plant drench or directed spray in-furrow below seed
  • 14 oz/acre
  • One application per season
  • 21day PHI
SERENADE SOIL on Tomatoes
Yields – Drip apps followed by foliar apps

Soil materials applied at full flower and fruit set via underground drip irrigation.
Large block grower demonstration field trials. Serenade ASO applied twice at 2 qts/acre each time.

The first application was timed for 10-14 days after transplanting or first flower. The second application was timed for full flowering. All fields lacked significant soil diseases. The grey bars are untreated areas.
BELT
Technical Features

- **SUPERIOR CROP PROTECTION:**
  - Rapid feeding cessation
  - Extended residual activity
  - Broad spectrum control of all important lepidopteran pests
  - Excellent translaminar action and rainastness
  - Safe to bees
  - Outstanding crop safety
  - Excellent tankmix compatibility

- **USE:**
  - 1.5 oz/acre
  - Limit 3 applications per season
  - 12hr REI
  - 1day PHI
APPLICATIONS FOR TOMATOES:

- Low toxicity to bees and other beneficial insects
- Control russet mites, whiteflies and more
- Slightly delayed onset of activity
- Long residual activity
- Applications
  - 7.0 – 8.5 oz/acre
  - Maximum of 25.5 oz/acre/season
  - PHI 1 day
Product Introduction
In California

Foliar and soil applied insecticide
Mode of Action – Sivanto is **not** a neonic

<table>
<thead>
<tr>
<th>IRAC MoA Classification v 7.3 February 2014</th>
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</thead>
<tbody>
<tr>
<td>4 Nicotinic acetylcholine receptor (nAChR) agonists</td>
</tr>
<tr>
<td>4A Neonicotinoids</td>
</tr>
<tr>
<td>4B Nicotine</td>
</tr>
<tr>
<td>4C Sulfoxaflor</td>
</tr>
<tr>
<td>4D Butenolides</td>
</tr>
</tbody>
</table>

CNI chemistry

butenolide chemistry
Biological Characteristics

- Activity via ingestion and contact
- Adult knockdown, immature control
- Rapid and strong feeding cessation effect
- Xylem mobile & translaminar movement; whole-plant protection from soil applications; moves from tops to undersides of leaves and from points of contact to tips of leaves from foliar applications
- Excellent residual control
- Excellent honey bee and bumble bee safety profile
- Reduced risk to many beneficial arthropods

![Images of Whitefly, Scale, Psyllid, Aphid, Leafhopper]
Excellent Safety Profile

Human safety
Favorable mammalian toxicity risk profile supported Reduced Risk designation across multiple crops

Pollinator safety
Honey- and bumble bee-friendly profile supports flexible application timings

Environmental safety
Fits well with integrated pest management (IPM) systems

Sivanto received Reduced Risk designation by the U.S. EPA

* U.S. EPA = U.S. Environmental Protection Agency.
** Citrus, cotton, cucurbit vegetables, fruiting vegetables, pome fruit.
### Luna Label Expansion – CA/AZ

#### Crops by Brand

<table>
<thead>
<tr>
<th>Expansion Label</th>
<th>Current Label</th>
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<tbody>
<tr>
<td>Strawberry*</td>
<td>Tree Nuts</td>
</tr>
<tr>
<td>Leafy Veg*</td>
<td>Cherry</td>
</tr>
<tr>
<td>Cucurbit*</td>
<td>Apple</td>
</tr>
<tr>
<td>Stone*</td>
<td>Watermelon</td>
</tr>
<tr>
<td>Pome*</td>
<td>Potato</td>
</tr>
<tr>
<td>Citrus*</td>
<td>Apple</td>
</tr>
<tr>
<td>All Grapes*</td>
<td>Wine Grape</td>
</tr>
<tr>
<td>Fruiting Veg*</td>
<td>Tree Nuts</td>
</tr>
<tr>
<td>Brassica*</td>
<td>Cherry</td>
</tr>
<tr>
<td>Carrot*</td>
<td>Apple</td>
</tr>
<tr>
<td>Pome*</td>
<td>Watermelon</td>
</tr>
<tr>
<td>Strawberry*</td>
<td>Potato</td>
</tr>
<tr>
<td>Bulb Veg*</td>
<td>Apple</td>
</tr>
<tr>
<td>Pome*</td>
<td>Apple</td>
</tr>
<tr>
<td>Berries*</td>
<td>Apple</td>
</tr>
</tbody>
</table>

*Always read and follow label directions.

Federal registration for expanded label anticipated Fall 2015, State labels to follow.

*Luna is not yet registered for sale or use on these crops in the United States.*
<table>
<thead>
<tr>
<th>Key Crops and Pathogens</th>
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<tbody>
<tr>
<td><strong>Fruiting Vegetables</strong></td>
</tr>
<tr>
<td>Early blight</td>
</tr>
<tr>
<td>Target spot</td>
</tr>
<tr>
<td>Anthracnose</td>
</tr>
<tr>
<td>Powdery mildew</td>
</tr>
<tr>
<td>Septoria leaf spot</td>
</tr>
<tr>
<td>Gray mold</td>
</tr>
<tr>
<td>Gray leaf spot</td>
</tr>
<tr>
<td>Black mold</td>
</tr>
</tbody>
</table>
Tomato – Powdery mildew
Four applications at 7.6 oz on 7/22, 7/31, 8/12 and 8/21
Evaluated 9/1

Turini and Rodriguez,
UC WRES, Five Pts., CA 2009

Untreated
74% incidence

13.3% Incidence
LUNA SENSATION
Powdery Mildew* in Tomatoes

Brenna Aegerter. UCCE San Joaquin County

% Disease Severity, 17DAT3

0 5 10 15 20 25 30 35 40 45

Luna Sensaton 5 fl oz  b
Luna Sensaton 7 fl oz  b
Priaxor 8 fl oz  b
Mettle 6.5 fl oz  b
Quadris Top 8 fl oz  b
Aprovia Top 8 fl oz  b
Rhyme 5 fl oz  b
Untreated  a

*Oidium spp. Fresh market variety roma-type cv “Galilea. RCB design with reps. All materials were applied with a CO2 sprayer with hollow cone nozzles operating at 50 GPA and 34 psi. Applications were made on 8/24, 9/4 and 9/18. All treatments were applied with Latron B-1956 at 0.25% v/v. Disease severity was evaluated on 9/12 and 9/28. This chart exhibits the 9/28 evaluation. Location: 5 mi SE of Stockton.
LUNA SENSATION
Blackmold* in Tomatoes

Scott Stoddard. UCCE Merced County

% Incidence by weight

Luna Sensation 7 fl oz  Quadris Top 8 fl oz  Priaxor 8 fl oz  Bavo WeatherStick 2.75 pts  Untreated

*Alternaria alternata. This trial was established near Dos Palos in Merced County. It was set up in a RCB design with 5 replicates. Materials were applied on 8/12, 8/26 and 9/12. Luna Sensation missed the first application and was applied on 8/19. Applications were with CO2 powered backpack sprayer operating at 76 GPA. Disease incidence was evaluated by assessing 100 randomly selected fruit from each plot. Bars with the same letter are NSD at P=0.05.
VELUM
Powdery Mildew* in Tomatoes

Brenna Aegerter. UCCE San Joaquin County

*Leveillula taurica and Oidium spp. Applications A, C and E are through sub-surface drip irrigation (9" deep drip tape) with 30-45 minute injection times followed by 3-4 hours of irrigation. Applications B, D, F and G are sulfur dust with a hand crank duster. Poor growth and yield due to high salinity. NSD among treatments
The Bayer Portfolio for Tomatoes

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