What’s New on the Horizon: Recently and Soon to be Released Fungicides for Golf Turf

(2011-2016)

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Extension Specialist in Turfgrass Pathology
School of Environmental and Biological Sciences
Rutgers University
Overview: New Fungicides for Golf Course Turf (2011-2016)

- New Single Product Fungicides
- New Formulations and Rebranded /Generic Single Product Fungicides
- New Fungicide Pre-Mixes
- Soon to be Released Fungicides
<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Common Name</th>
<th>FRAC #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autilus</td>
<td>PCNB (rebranded)</td>
<td>14</td>
</tr>
<tr>
<td>Appear</td>
<td>phosphite</td>
<td>33</td>
</tr>
<tr>
<td>Civitas + Harmonizer</td>
<td>mineral oil + pigment (Premix)</td>
<td>P</td>
</tr>
<tr>
<td>Daconil Action</td>
<td>chloro+ acibenzolar</td>
<td>M5 + P1</td>
</tr>
<tr>
<td>Fiata StressGard</td>
<td>phosphite</td>
<td>33</td>
</tr>
<tr>
<td>Heritage Action</td>
<td>azoxystrobin+ acibenzolar</td>
<td>11 + P1</td>
</tr>
<tr>
<td>Mirage StressGard</td>
<td>tebuconazole</td>
<td>3</td>
</tr>
<tr>
<td>Secure</td>
<td>fluazinam</td>
<td>29</td>
</tr>
<tr>
<td>Signature Xtra Stress</td>
<td>aluminum tris (fosetyl-AL)</td>
<td>33</td>
</tr>
<tr>
<td>Velista</td>
<td>penthiopyrad</td>
<td>7</td>
</tr>
<tr>
<td>Xzemplar</td>
<td>fluxapyroxad</td>
<td>7</td>
</tr>
</tbody>
</table>
AUTILUS® Flowable Turf Fungicide

- Active ingredient: PCNB Labeled for golf course greens, tees and fairways
- Good efficacy against anthracnose (Chlorosis in hot weather)
- Application Windows: May – mid-June; September – October (water-based formulation in future – reduce burn)
- Unique mode of action – FRAC Group 14 (aromatic hydro)
  - Tank-mix option for resistance management
- Should be tank-mixed with a pigment product
Anthracnose symptomology

Anthracnose Foliar Blight on *Poa* (*Stowell*)

Acervuli (reproductive structures), with setae (sterile hairs) protruding
<table>
<thead>
<tr>
<th>Product</th>
<th>Rate/1,000 SQFT</th>
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</thead>
<tbody>
<tr>
<td>Oreon</td>
<td>6 fl.oz.</td>
</tr>
<tr>
<td>Oreon</td>
<td>8 fl.oz.</td>
</tr>
<tr>
<td>Velista</td>
<td>0.5 oz.</td>
</tr>
<tr>
<td>Torque</td>
<td>1.1 fl.oz.</td>
</tr>
<tr>
<td>Signature</td>
<td>4 fl.oz.</td>
</tr>
<tr>
<td>Signature XTRA</td>
<td>4 fl.oz.</td>
</tr>
</tbody>
</table>

Untreated Plot Ratings
29 July: 66.0%
8 August: 91.5%
18 August: 93.8%

*Treatment included the pigment product Par at 1 pint/A
Appear™ Fungicide

Anthracnose
Pythium

Basic Application Guidelines
Rate: 3 to 8 fl oz per 1000 ft², Application interval: 7 to 14 days
Used in programs to provide disease control and reduce plant stress
Anthracnose Trial 2011: Rutgers University
Annual Bluegrass (Greens Height)

Applications: May 17, 31; June 14, 28; Jul 12, 26; Aug 9, 23.

*Rate per 1,000 ft².

Spray program included Appear applications in June, July and August.
Civitas + Harmonizer?

- Civitas is a mineral oil (Acropetal penetrant)
  - mixture of food-grade synthetic isoparaffins and a food-grade emulsifier developed by Suncor (Petro-Canada)
- Mode of action: **Induced systemic resistance** (activates plant signaling genes/antimicrobial compounds).
- Harmonizer (green pigment)
- Civitas Turf Defense Premix (need to shake well before use), Ready-2-Mix (mineral oil), Civitas Harmonizer
Relative Efficacy of New Fungicides for Cool - Season Turf Diseases: 2015

* Efficacy on a 1-4 Scale, where 1 = not effective, 2 = fair – good control, 3 = good – excellent control, and 4 = excellent control. Limited = insufficient data.

Civitas

<table>
<thead>
<tr>
<th>Disease</th>
<th>Limited</th>
<th>None</th>
<th>Fair</th>
<th>Good</th>
<th>Excellent*</th>
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<tbody>
<tr>
<td>Anthracnose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown Patch</td>
<td></td>
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<td></td>
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<tr>
<td>Dollar Spot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>leaf Spot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Necrotic Ring Spot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pink Snow Mold</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Thread</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Efficacy on a 1-4 Scale, where 1 = not effective, 2 = fair – good control, 3 = good – excellent control, and 4 = excellent control. Limited = insufficient data.
Control of Anthracnose Basal Rot with Civitas 98AS on an Annual Bluegrass (*Poa annua L.*) Green in North Brunswick, NJ - 2010

Relatively poor disease control obtained with a 6% solution of Civitas + Harmonizer pigment applied every 14-d from 18 May – 17 August 2010 – Note thinning and sealing off of the soil surface on Civitas treated turf
Daconil Action

– Chlorothalonil + acibenzolar
– Syngenta released for sale fall 2011
– Acibenzolar (FRAC group P) ; induces host plant defense (not directly toxic to fungi)
– Stimulates natural defense through SAR
– Controls every disease that Daconil does + some suppression of Pythium
Relative Efficacy of New Fungicides for Cool-Season Turf Diseases: 2012

Daconil Action

<table>
<thead>
<tr>
<th>Disease</th>
<th>Limited</th>
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<th>Fair</th>
<th>Good</th>
<th>Excellent*</th>
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<tbody>
<tr>
<td>Anthracnose</td>
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<td>Brown Patch</td>
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<tr>
<td>Dollar Spot</td>
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<tr>
<td>Gray Snow Mold</td>
<td></td>
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<tr>
<td>Leaf Spot</td>
<td></td>
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<tr>
<td>Pink Snow Mold</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pythium Blight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Thread</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Rust</td>
<td></td>
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</tbody>
</table>

* Efficacy on a 1-4 Scale, where 1 = not effective, 2 = fair – good control, 3 = good – excellent control, and 4 = excellent control. Limited = insufficient data.
Photos taken at Rutgers Univ. bent green on August 27, 2010
Fiata StressGard

Mono- and di-potassium salts of phosphorous acid

Pythium Blight and damping-off diseases

Basic Application Guidelines
Rate: 5 to 15 fl. oz./1,000 sq. ft., Application interval: 14 to 28 days
Used in programs to provide disease control and reduce plant stress
Heritage Action Fungicide
(Azoxystrobin + acibenzolar)

Same Disease Control Spectrum as Heritage
Summer Patch Control: (Heritage left & Check right) on Kentucky bluegrass
2014 Summer Patch Trial – Clarke, Rutgers University
28 day spray interval

Syngenta Program # 1
Headway applied at 3.0 fl oz on May 22
Briskway applied at 0.725 fl oz on June 19 and July 17
Secure™ Fungicide

| Pyridinamine | 29 | Fluazinam | Secure | Protectant fungicide. Mode of Action: inhibits energy production at multiple sites |

Anthracnose, Brown Patch, Dollar Spot, Snow Mold, Leaf Spot, Red Thread, Rust

Basic Application Guidelines

Rate: 0.5 fl oz per 1000 ft², Application interval: 14 days
Limit: 258 fl. oz. per acre/year. (12 apps @ 0.5 fl. oz./1000 sq. ft. per season)
Dollar Spot Trial 2011: Rutgers University
Crenshaw Creeping Bentgrass (Fairway Height)

Applications: May 24; June 7, 21; Jul 5, 19; Aug 2, 16.

*Rate per 1,000 ft².
Dollar Spot Trial 2011: Rutgers University
Crenshaw Creeping Bentgrass (Fairway Height)
July 26, 2011

Chlorothalonil 2.0 fl oz

Secure™ 0.5 fl oz
Dollar Spot Control – Rutgers 2013

First Application on May 23
Last Application on August 14

Fairway height Crenshaw creeping bentgrass

Number of lesion centers

- Secure 0.5 fl oz/14 day
- Chipco 26 GT 4.0 fl oz/14 day
- Curalan 1.0 oz/21day

Legend:
- First Application on May 23
- Last Application on August 14

Graph shows the number of lesion centers over time with application dates and concentrations.
Signature Xtra Stressgard

- Pythium, yellow tuft, anthracnose (tank mixed)
- Fosetyl-Al rate lowered, now 60 WDG vs. 80 WDG
- Reduction allows for inclusion of additional components to optimize plant health
- Alleviates biotic and abiotic stress
- Enhanced formulation for improved tank-mix compatibility
Enhanced Formulation - 20 Hours after Mixing
Pythium Blight

Fungicides were applied on 27 June, 1 July, 4 July (7 day treatment), 11 July (7 and 14 day treatments), 18 July (7 and 21 day treatments), 25 July (7 and 14 day treatments), 1 August (7 day treatment), 8 August (7 and 14 day treatment), and 15 August (7 day treatment).

B. Clarke, Rutgers University, 2014
### Evaluation of Signature XTRA Stressgard: Anthracnose

Rutgers University - Clarke

<table>
<thead>
<tr>
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<th>Rate</th>
<th>Int.</th>
<th>Rating†</th>
<th>yr</th>
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<td>2 oz</td>
<td>7 d</td>
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<tr>
<td></td>
<td>2 oz</td>
<td>14 d</td>
<td>✓</td>
<td></td>
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<td></td>
<td>4 oz</td>
<td>14 d</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 oz</td>
<td>14 d</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>60 WG</td>
<td>2 oz</td>
<td>7 d</td>
<td>✓</td>
<td>2014</td>
</tr>
<tr>
<td></td>
<td>3.3 oz</td>
<td>14 d</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 oz</td>
<td>14 d</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>60 WG</td>
<td>3 oz</td>
<td>14 d</td>
<td>✓</td>
<td>2013</td>
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<tr>
<td></td>
<td>3.3 oz</td>
<td>14 d</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 oz</td>
<td>7 d</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 oz</td>
<td>14 d</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 oz</td>
<td>14 d</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

† 1 = Poor, 2 = Fair, 3 = Good, 4 = Excellent
Turf Quality – 60% ET

Irrigation deficit started on May 30
‘L93’ mowed at 0.375”

- Untreated control
- Signature Xtra Stressgard only
- Signature Xtra Stressgard only - Half rate weekly

Turf Quality – 60% ET

- UNTREATED
- SIGNATURE XTRA 4 OZ / 14-day
- SIGNATURE XTRA 2 OZ / 7-day

Days of Treatment / Date:

- 15-May
- 22-May
- 29-May
- 5-Jun
- 12-Jun
- 19-Jun
- 26-Jun
- 3-Jul
- 10-Jul
- 17-Jul
- 24-Jul
- 31-Jul
- 7-Aug
- 14-Aug
- 21-Aug
Untreated Control

Signature Xtra Stressgard
4 oz @ 14 days

Signature Xtra Stressgard
2 oz @ 7 days

100% ET

60% ET

August 21, 2015

B. Huang, Rutgers University, 2015
Velista

- Active ingredient: penthiopyrad
- SDHI fungicide: acropetal penetrant
- Fungicide class: carboximide
- FRAC group: 7
- Formulation: 50WDG
- Application rate: 0.3 - 0.5 oz 1000-ft\(^2\)
- Pending registration in the US: Spring 2014
Relative Efficacy of New Fungicides for Cool-Season Turf Diseases: 2005-2011 (Golf)

* Efficacy on a 1-4 Scale, where 1 = not effective, 2 = fair – good control, 3 = good – excellent control, and 4 = excellent control. Limited = insufficient data.
Brown Patch Trial: Colonial Bentgrass
Rutgers University, Summer 2012

21 day spray interval

Percent turf area infested/plot

- = level of acceptable disease control

Rating dates:
- 29-Jul
- 8-Aug
- 18-Aug
- 28-Aug

Application Dates: June 5 and 26; July 17; August 7 and 28.
Dollar spot control on creeping bentgrass fairway—UCONN 2010

*Applied every 14-d or 21-d from early-Jun through late-Jul 2010
Preventive Control of Anthracnose on an Annual Bluegrass Green (Test-1) : Rutgers, 2011*

* Fungicides applied from 17 May to 23 August
Xzemplar Fungicide

(fluxapyroxad)

Anthracnose, Dollar Spot, Brown Patch, Snow Mold, and Summer Patch
Dollar Spot Efficacy on Creeping Bentgrass Greens
48 Days after First Application

Applications initiated 8/28/12
Xzemplar is at 6 DAT following 2 applications (21-d interval)
Velista and Daconil Ultrex are at 14 DAT following 3 applications (14-d interval)
North Carolina State University, 2012

→ Xzemplar fungicide on a 21-day application interval provides greater dollar spot control than competitive products on 14-day interval.
Preventative Dollar Spot Trial on Bentgrass Greens

Untreated

Xzemplar (0.26 fl. oz./1,000 sq. ft.)
- 28-day interval
- Applications on 6/6, 7/3, 7/31

Xzemplar (0.21 fl. oz./1,000 sq. ft.)
- 21-day interval
- Applications on 6/6, 6/27, 7/17, 8/9

Photos taken on 8/6/13
Kansas State University, 2013
New Formulations and Rebranded /Generic Single Product Fungicides for Golf Turf

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Common Name</th>
<th>FRAC #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hertiage G</td>
<td>azoxystrobin</td>
<td>11</td>
</tr>
<tr>
<td>ArmorTech ZOXY SC**</td>
<td>azoxystrobin</td>
<td>11</td>
</tr>
<tr>
<td>Fame (Disarm) G*</td>
<td>fluoxastrobin</td>
<td>11</td>
</tr>
<tr>
<td>Fame (Disarm) SC*</td>
<td>fluoxastrobin</td>
<td>11</td>
</tr>
<tr>
<td>Insignia Intrinsic*</td>
<td>pyraclostrobin</td>
<td>11</td>
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</tbody>
</table>

* Rebranded product, ** New generic of existing product
## New Fungicide Pre-Mixes for Golf Turf

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Common Name</th>
<th>FRAC #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arbortech ZOXY-T</td>
<td>azoxystrobin + tebuconazole</td>
<td>11 + 3</td>
</tr>
<tr>
<td>Briskway</td>
<td>azoxystrobin + difenoconazole</td>
<td>11 + 3</td>
</tr>
<tr>
<td>Enclave</td>
<td>T-methyl, teb. + chloro. + ipro</td>
<td>1 + 3 + M5 + 2</td>
</tr>
<tr>
<td>Headway G</td>
<td>azoxystrobin + propiconazole</td>
<td>11+ 3</td>
</tr>
<tr>
<td>Lexicon</td>
<td>Insignia + fluxapyroxad</td>
<td>11 + 7</td>
</tr>
<tr>
<td>Pillar</td>
<td>pyraclostrobin + triticonazole</td>
<td>11 + 3</td>
</tr>
<tr>
<td>Stellar</td>
<td>fluopicolide + propamocarb</td>
<td>28 + 43</td>
</tr>
<tr>
<td>Tartan</td>
<td>trifloxystrobin + triadimefon</td>
<td>11 + 3</td>
</tr>
<tr>
<td>ArborTech TMI**</td>
<td>thiophanate + iprodione</td>
<td>1 + 2</td>
</tr>
<tr>
<td>Fame (Disarm) C*</td>
<td>fluoxastrobin + chlorothalonil</td>
<td>11 + M5</td>
</tr>
<tr>
<td>Fame (Disarm) T*</td>
<td>fluoxastrobin + tebuconazole</td>
<td>11 + 3</td>
</tr>
<tr>
<td>Honor Intrinsic*</td>
<td>boscalid + pyraclostrobin</td>
<td>7 + 11</td>
</tr>
<tr>
<td>Interface StressGard*</td>
<td>iprodione + trifloxystrobin</td>
<td>2 + 11</td>
</tr>
</tbody>
</table>

* Rebranded product, ** New generic premix of existing products
Briskway™ Fungicide
(Azoxystrobin + difenoconazole)

Anthracnose, Brown Patch, Brown Ring Patch, Dollar Spot, Fairy Ring, Gray Leaf Spot, Leaf Spot, Red Thread, Snow Mold, Patch Diseases

Basic Application Guidelines
Rate: 0.3 to 0.725 fl oz per 1000 ft², Application interval: 14 to 28 days
(3 apps @ 0.5 fl. oz./1000 sq. ft. per season)
Used in programs to avoid exceeding limits
Difenoconazole Safety on Creeping Bentgrass
Rutgers, 2009
Note: Excessive rainfall followed by extreme temperatures led to extremely high disease pressure
Control of Summer Patch with Briskway – July 25, 2013

28 day interval

21 day interval

UTC
Lexicon Fungicide

(Insignia + fluxapyroxad)

Anthracnose, Dollar Spot, Brown Patch, Brown Ring Patch, Fairy Ring, Snow Mold, and Summer Patch
Suppressing Summer Patch with Selected fungicides on Kentucky Bluegrass: Rutgers University: 2011

Lexicon Intrinsic 4.17SC = Insignia + fluxapyroxad, Xzemplar 2.5SC = fluxapyroxad; Interval = 28 day
Soon to be Released Fungicides for Golf Turf

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Common Name</th>
<th>FRAC #</th>
</tr>
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<tbody>
<tr>
<td>Exteris StressGard (9/16)</td>
<td>Fluopyram + trifloxystrobin</td>
<td>7 + 11</td>
</tr>
<tr>
<td>Oreon (2/16)</td>
<td>PCNB + tebuconazole</td>
<td>14 + 3</td>
</tr>
<tr>
<td>Pinpoint (2016)</td>
<td>mandestrobin</td>
<td>11</td>
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<tr>
<td>Kabuto (2/16)</td>
<td>Isofetamid</td>
<td>7</td>
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<tr>
<td>ArborTech IP (2/16)**</td>
<td>Iprodione</td>
<td>2</td>
</tr>
<tr>
<td>Goliath WP (2/16)**</td>
<td>Azoxystrobin + propiconazole</td>
<td>11 + 3</td>
</tr>
</tbody>
</table>

** New generic of existing product or premix
SDHI (Succinate dehydrogenase inhibitors)

- Pyridinyl-ethyl-benzamide (fluopyram = Exteris StressGard)
- Phenyl-benzamide (flutolanil = ProStar)
- Phenyl-oxo-ethyl-thiophene amide (isofetamid = Kabuto)
- Pyrazole-4-carboximide (fluxapyroxad = Xzemplar)
  (pentiopyrad = Velista)
- Pyridine-carboxamide (boscalid = Emerald)
## Evaluation of Exteris Stressgard: Dollar Spot

**Rutgers University - Clarke**

<table>
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<tr>
<th>Form</th>
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<th>Int.</th>
<th>Rating†</th>
<th>Yr</th>
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<tr>
<td></td>
<td></td>
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<td>1 2 3</td>
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</tr>
<tr>
<td>0.27 SC</td>
<td>1.5 fl oz</td>
<td>7 d</td>
<td>✓ ✓</td>
<td>2015</td>
</tr>
<tr>
<td></td>
<td>1.5 fl oz</td>
<td>14 d</td>
<td>✓ ✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 fl oz</td>
<td>14 d</td>
<td>✓ ✓</td>
<td></td>
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<tr>
<td></td>
<td>3 fl oz</td>
<td>14 d</td>
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<td>4 fl oz</td>
<td>21 d</td>
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<td>4 fl oz</td>
<td>CUR</td>
<td>✓ ✓</td>
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</tr>
<tr>
<td></td>
<td>6 fl oz</td>
<td>28 d</td>
<td>✓ ✓</td>
<td></td>
</tr>
</tbody>
</table>

| 0.27 SC | 1.5 fl oz | 7 d  | ✓ ✓      | 2014|
|         | 1.5 fl oz | 14 d | ✓ ✓      |     |
|         | 2 fl oz   | 14 d | ✓ ✓      |     |
|         | 3 fl oz   | 14 d | ✓ ✓      |     |
|         | 4 fl oz   | 14 d | ✓ ✓      |     |
|         | 4 fl oz   | CUR | ✓ ✓      |     |
|         | 6 fl oz   | 28 d | ✓ ✓      |     |

† 1 = Poor, 2 = Fair, 3 = Good, 4 = Excellent
## Evaluation of Exteris Stressgard: Pink Snow Mold

**Rutgers University - Clarke**

<table>
<thead>
<tr>
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<th>Rate</th>
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<th>yr</th>
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<td>2.86 fl oz</td>
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</tr>
<tr>
<td></td>
<td>3.82 fl oz</td>
<td>once</td>
<td>✓</td>
<td>2014</td>
</tr>
<tr>
<td></td>
<td>4.77 fl oz</td>
<td>16-Nov-13</td>
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</tr>
<tr>
<td>5.73 fl oz</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.27 SC</td>
<td>4.14 fl oz</td>
<td>CUR once</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>9 fl oz</td>
<td>8-Mar-14</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

† 1 = Poor, 2 = Fair, 3 = Good, 4 = Excellent
Control of Pink Snow Mold with Exteris Stressgard 0.27SC on Annual Blue/Bentgrass: Tee# 8; Peace Pipe Golf Course, Denville, NJ, 2013 – 2014 (SM-1-13/14)

Rating date: 1- April 2014

Fungicides applied on November, 2013
OREON Fungicide

- Active ingredients: PCNB plus tebuconazole
- New water-based formulation
- Labeled for golf course greens, tees and fairways
- Excellent efficacy against anthracnose, as well as BP, BRP, YP, $, FR, PSM, NRS, PP, RT, Rust, SP, TA
- Dual modes of action – FRAC Groups 14 (AH) and 3 (DMI)
  - Pre-mix for resistance management
- Should be tank-mixed with a pigment product
Oreon (PCNB + tebuconazole)

Suppression of chlorosis induced by high rates (8 and 16 fl oz/M of Oreon with PAR pigment on a CBG Fairway

Clarke, Rutgers – 2015
Conclusions

- AUTILUS first PCNB formulation for suppression of diseases (anthracnose) on cool-season (ABG/CBG); Spring & Fall applications; add a pigment to avoid chlorosis
- Oreon PCNB (New water-based formulation – 2/16) plus tebuconazole; broad spectrum control with less chlorosis; Spring & Fall applications; add a pigment to avoid chlorosis
- Appear and Fiata are two very effective phosphite fungicides with a dual mode of action to reduce disease
- Daconil Action is a very effective fungicide that combines benefits of a contact fungicide w/ a plant activator (ASM)
Conclusions

- Secure is an excellent contact fungicide with a spectrum of activity similar to, but often more effective than, Daconil.
- Daconil Action and Secure are contact fungicides with a low risk of resistance.
- Heritage Action is a very effective penetrant fungicide that combines benefits of a broad spectrum fungicide w/ ASM.
- Velista and Xzemplar: two new broad spectrum SDHI fungicides with very good activity against dollar spot, brown patch, rust & red thread; excellent tank mix partner for anthracnose, summer patch.
Conclusions

- Tank mixing Velista (or Xzemplar) will improve efficacy for summer patch, pink snow mold, and leaf spot diseases as well as reducing the potential for fungicide resistance.

- Briskway is an effective mixture of DMI and QoI fungicides that controls a wide range of diseases that reduces the risk of fungicide resistance associated with the QoI fungicides while improving efficacy.

- Signature Xtra Stressgard is an excellent systemic fungicide with improved disease control properties compared to the original formulation of fosetyl-AL & provides improved stress (esp. drought) tolerance.
Conclusions

- Civitas is a mineral oil that enhances the plants ability to resist disease through a process call Induced Systemic Resistance, but can cause toxicity during hot weather.
- Lexicon is a pre-mix of a QoI + carboximide fungicide that will improve efficacy for more than two dozen turf diseases as well as reducing the potential for fungicide resistance.
- Exteris Stressgard (9/16) is a new fungicide containing fluopyram (benzamide) + trifloxystrobin (QoI) that provides excellent control of dollar spot and pink snow mold.
- Kabuto (Isofetamid) is a new SDHI fungicide that provides excellent control of dollar spot
Are There any Questions?

Rutgers Turfgrass Research Field Days: (turf.rutgers.edu)
- August 2, 2016 (Golf Research – New Brunswick, NJ)
- August 3, 2016 (Landscape Turf Res. – Adelphia, NJ)