



f u n g i c i d e

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Brown Patch

Product information,
Integrated Pest Management Programme
& Test Data

Outline

1. CIVITAS Overview

- What is CIVITAS
- Product Information
- Where to Use
- How to Use
- Compatibility
- Disease Information

2. CIVITAS IPM Outline

3. APPENDIX

- Test Data
- CIVITAS Efficacy and Trial Photos



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What is CIVITAS?

CIVITAS is the first commercially available fungicide for the golf industry that has been developed utilizing a unique mode of action called **Induced Systemic Resistance (ISR)**. It is a 'plant defense activator' that turns on the natural defenses of the plant to fight off fungus and reduces the need for traditional, toxic chemicals.

For more information, visit www.civitasturf.com



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General Product Information

- **Chemical class:** synthetic isoparaffins
- **Mode of Action:** ISR (Induced systemic resistance). Induce plant natural defense system against diseases
- **Mobility:** systemic, topical
- **Risk of resistance:** low
- **Signal word:** Caution
- **FRAC group:** not listed
- **REI:** When spray has dried.
- **PPE:** long sleeved shirt and long pants/chemical-resistant gloves/shoes plus socks
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- **EPA Reg. No:** 69526-13



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Where to use CIVITAS

Grass Types	Diseases	Insects
Ryegrass	Dollar spot	Sod webworm
Bentgrass	Brown patch	Annual bluegrass weevils
Poa	Anthracnose	Banks grass mites
Bluegrass	Spring leaf spot	Mealybugs
	Grey leaf spot	Mites
	Fusarium patch	Cutworm
	Powdery mildew	Fall armyworm
	Grey snow mold	
	Pink snow mold	



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How to use CIVITAS

1. CIVITAS can be used alone or with other Fungicides in your current IPM program to enhance turf quality.

- See the APPENDIX for data demonstrating various application frequency and volume combinations

2. Use CIVITAS for Preventative and Curative Purposes

- **Preventative** applications for **low** to moderate disease pressure (early and late season)
 - Typical Rate: Apply CIVITAS alone at 14.5 oz/1000 sq.ft* in 1 to 2 gallons of water/1000 sq.ft
 - **Curative** application at **high** disease pressure by tank mixing with half rate of fungicides:
 - For Example:
 - Typical Rate: 14.5 oz/1000 sq.ft* Civitas + 0.5oz/1000 sq.ft propiconazole in 1 to 2 gallons of water/1000 sq.ft for the control of Dollar Spots
 - Typical Rate: 8 oz/1000 sq.ft* Civitas + 2 oz/1000 sq. ft of thiophanate methyl with 1 to 1 gallons of water/1000 sq. ft for the congrol of Grey Leaf Spots
- *NB. CIVITAS application rates do not include Harmonizer. This is added at a 16:1 ratio (Civitas:Harmonizer).

3. CIVITAS application rate, frequency and nomenclature

- FULL application of CIVITAS is 14.5oz/1000sq ft
- HALF application of CIVITAS is 8 oz/1000sq ft
- IPM frequencies tested are: 7, 14, 21 and 28 days*. (d=days)

Frequency dependent on disease pressure and tank mix partner

**Do not exceed maximum Chlorothalonil amounts indicated in IPM Program












- Patent Pending Tank Mix



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Tested CIVITAS Compatibility Bentgrass, POA and Ryegrass

<u>Active Ingredient</u>	<u>Compatible</u> (Bentgrass, Poa)	<u>Incompatible</u> (Ryegrass)	
Strobilurin, Fluoxastobin			
Thiophanate methyl			
Phosphite			
Chlorothalonil		X*	* On Ryegrass, the tank mix of CIVITAS and Chlorothalonil produced phytotoxicity during periods of high temperature.
Iprodione			
Boscalid			
Propiconazole			
Quintozene/PCNB		X	
Bacillus licheniformis			
Polyoxin D zinc salt (1:1)			
<u>Fertilizer Foliar</u>			
<u>Growth Regulator</u> TRINEXAPAC-ETHYL			



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Disease Information

Brown Patch

- Affects all cool season turfgrasses
- Does not affect crowns or roots
- Is a summer disease (active during hot, humid periods when dew periods exceed 10 hours)
- Severe when nitrogen fertility is excessive during disease-favorable weather.

Symptoms

- Circular olive green stains
- 4-12 inches in diameter
- Leaf blades turn brown after infection, while a grey-white band is normally evident at the perimeter of active patches



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Richard Latin, Professor of Plant Pathology
Perdue University
<http://www.ces.purdue.edu/extmedia/botany.htm#5>

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IPM – CIVITAS & Brown Patch

Brown Patch (Bent/POA)			
<u>Preventative</u>	<u>Product</u>	<u>oz / 1000</u>	<u>Frequency, days</u>
Normal disease pressure (for early and late season)	CIVITAS	14.5	14
<u>Curative</u>	<u>Tank Mix</u>	<u>oz / 1000</u>	<u>Frequency, days</u>
Tank Mix	Propiconazole	0.5	Every 21 days
	CIVITAS	14.5	



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Brown Patch Test Data – Penn State University

Penn State

2008

Colonial Bentgrass

2 gal/1000 sqft

Teejet 11008E nozzles @ 40psi

Brown Patch Disease Incidence (1 - 10, 10=90%)

	oz /1000 sqft	Frequency				
		Days	10-Jun	03-Jul	16-Jul	25-Jul
Control			3	6	5.3	6.3
Chlorothalonil	1.6	14	3.3	3.7	3	3.3
Civitas	14.5	14	2.3	4.3	3.3	4
Civitas + Propiconazole	14.5	21	2.7	4.7	2.3	3.7
Tank mix	0.5					

Test conducted by Dr. Wakar Uddin, Penn State

21-day IPM recommendation

14-day IPM recommendation

***Do not exceed maximum Chlorothalonil amounts indicated in IPM program*



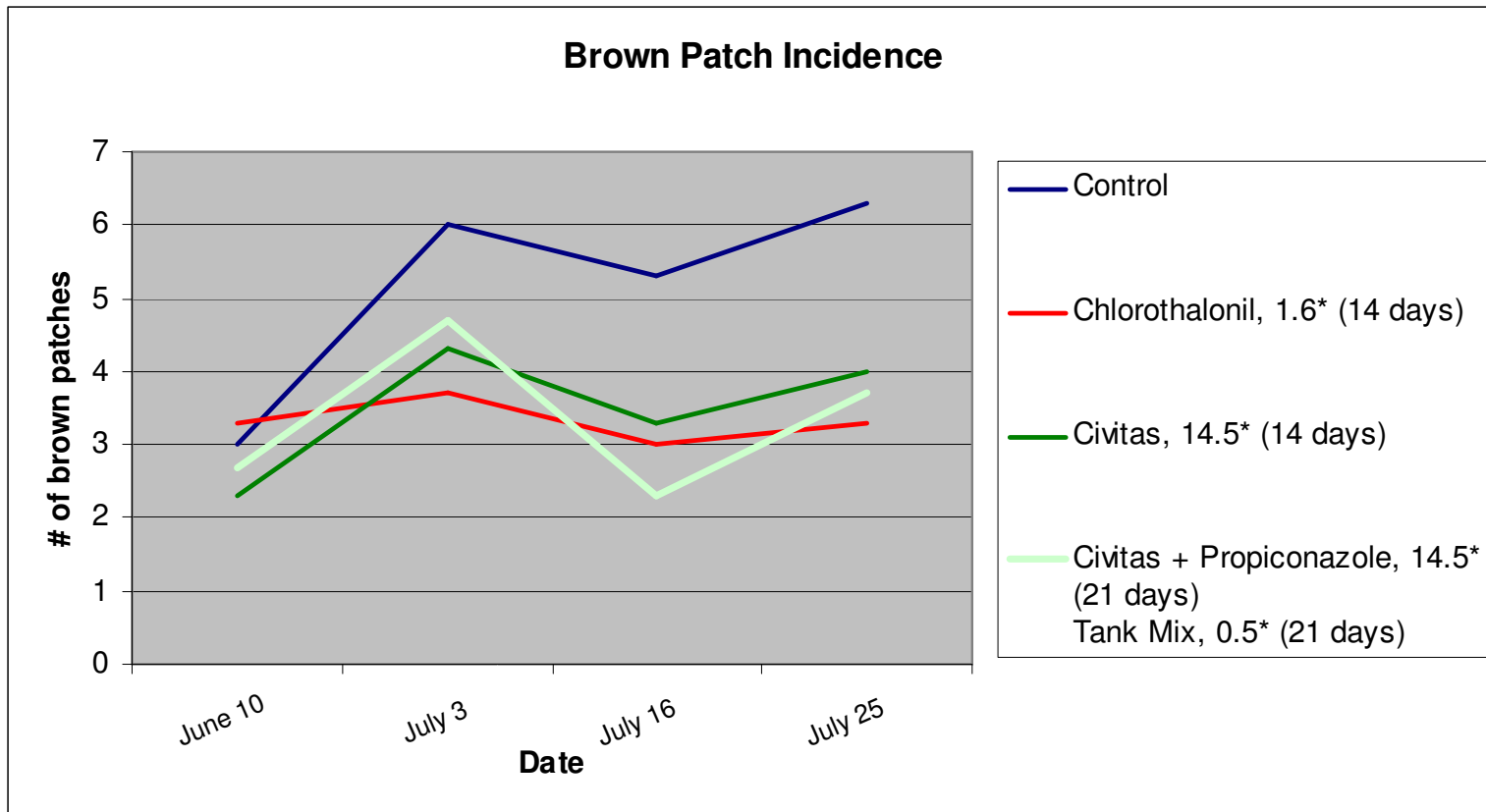
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Brown Patch Test Results – Penn State University

Data from testing at Penn State University shows Civitas formulations have no problem keeping up with competing chemical brands when treating brown patch



Notes:
 Colonial Bentgrass
 Penn State, 2008
 Test conducted by
 Dr. Wakar Uddlin,
 Penn State
 2 gal / 1000, TeeJet
 110008 Nozzles at
 40psi
 * oz/1000 sq. ft



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