



TM

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Gray Leaf Spot

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 control 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
- Patent Pending Tank Mix
- **Do not exceed maximum Chlorothalonil amounts indicated



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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

Gray Leaf Spot

- Infects and kills leaf blades
- Can progress into the crown area killing the individual plants
- Very rapid progression of infection
- Can survive winters (Midwest US) but rare
- Infection spreads via airborne spores
- Excessive nitrogen fertilizer contributes to increased disease severity

Symptoms

- Moderate Outbreaks = thin, off colored turf
- Severe Outbreaks = death and decay of extensive areas and ruin the entire turf strand



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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 & Gray Leaf Spot

Gray leaf Spot (Rye)

Applies to normal / high disease pressure for Preventative and Curative Applications

	<u>Tank Mix</u>	<u>oz / 1000</u>	<u>Frequency, days</u>
Tank Mix	Thiophanate methyl	2	Every 14 days
	CIVITAS	8	



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Gray Leaf Spot – Test Data

Waterfront Country Club, Moneta Virginia

2008

Ryegrass Fairway

2 gal / 1000

TeeJet XR110003 Nozzles

Gray Leaf Spot %

	<u>oz / 1000</u>	<u>Frequency</u>	<u>16-Jul</u>	<u>22-Jul</u>	<u>01-Aug</u>	<u>07-Aug</u>
	<u>Days</u>					
Control			0	2.5	32.5	50
Chlorothalonil	1.8	14	0.3	2.5	28.8	30
Civitas	14.5	14	0	1	15	23
Thiophanate Methyl	2	14	0.5	2	13.8	18.8
Thiophanate Methyl	4	14	0.5	1	4.8	9.3
Civitas + Thiophanate Methyl Tank mix	7.25 2	14	0.5	1.5	6	7.5
Civitas + Thiophanate Methyl Tank mix	14.5 2	14	0.8	1	5	10

Test conducted by Brandon Horvath and Dave McCall, Virginia Tech

14-day IPM Recommendation

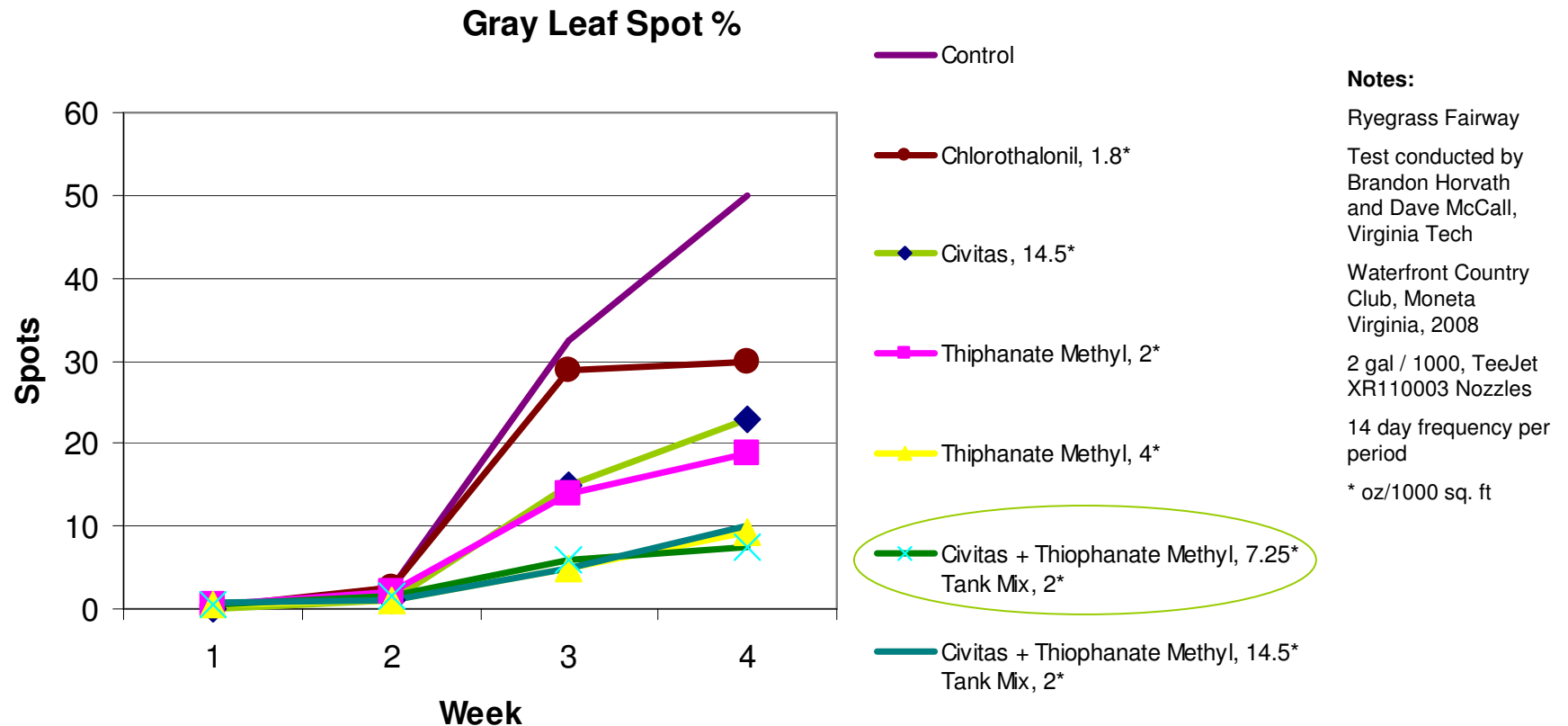


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Gray Leaf Spot – Test Results

From induction period through to high disease pressure, CIVITAS tank mix shows significant improvement in Gray leaf spot control versus other chemicals alone.



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