



f u n g i c i d e

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Crown Rust

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



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Disease Information

Crown Rust

- Also known as: Leaf Rust, Stem Rust
- Rust is a disease of taller mown turf
- Occurs almost exclusively on Kentucky bluegrass and perennial ryegrass
- Can severely damage new spring-seeded lawns that lose vigor during heat and drought conditions
- Most common in late summer/early fall
- Disease of slow growing turf
- Factors that enhance disease are summer heat, drought, low nitrogen fertilization , compaction and shade
- Requires moderate temperatures and long evening dew periods

SYMPTOMS

- Yellow-green appearance
- Numerous yellow-orange patches on leaf blades
- Carried by the wind or equipment to spread disease during the growing season



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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 & Crown Rust

Crown Rust				
<u>Preventative / Curative</u>		<u>Product</u>	<u>oz / 1000</u>	<u>Frequency, days</u>
	CIVITAS		14.5	14
<u>Preventative / Curative</u>		<u>Tank Mix</u>	<u>oz / 1000</u>	<u>Frequency, days</u>
Tank Mix	CIVITAS		14.5	21 days
	Propiconazole		0.5	



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Crown Rust Test Data – Penn State University

Treatment	Frequency (d)	03-Oct
Untreated Control	0	36.3
Civitas, 14.5*	14***	17
Civitas, 14.5* + Azoxystrobin, 0.5*	21**	10
Azoxystrobin, 2*	21**	6

*** (5 applications - 5, 19 Aug, 2, 16, 10 Sept)

** (3 applications - 5, 26 Aug, 16 Sept)

* oz/1000 sq ft.



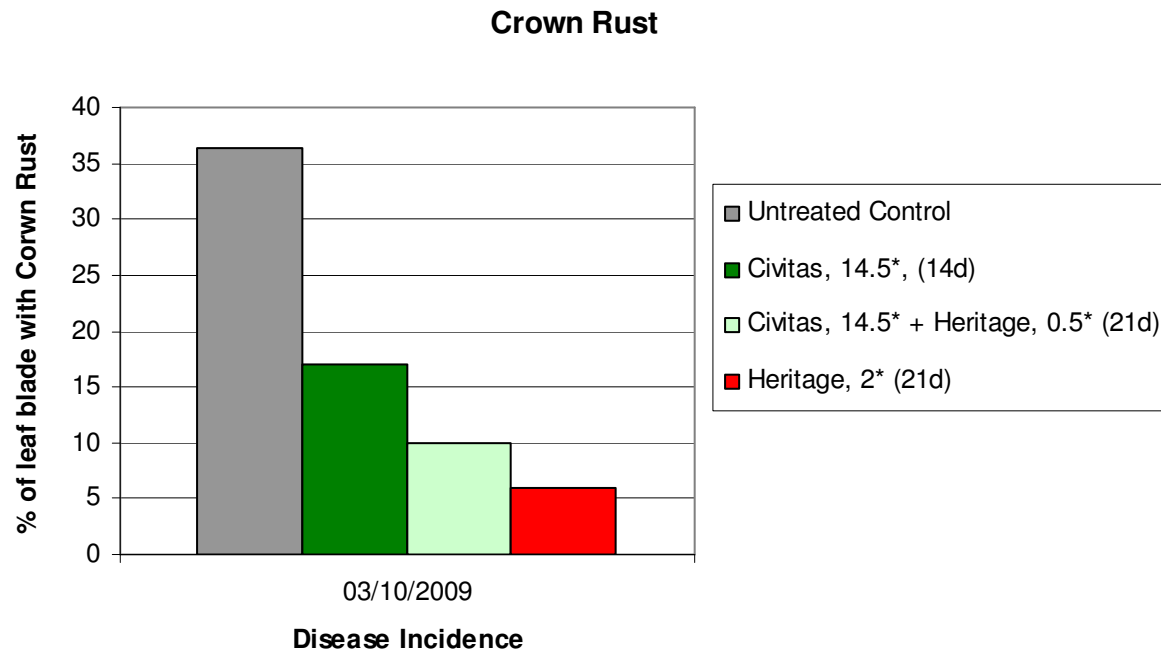
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Crown Rust Test Results – Penn State University

CIVITAS promotes turf health in the presence of Crown Rust with **no** resistance issues and **no** maximum use per acre.



CIVITAS:

5 applications - 5, 19 Aug, 2, 16, 10 Sept

CIVITAS + Tank Mix and Heritage Alone:

3 applications - 5, 26 Aug, 16 Sept

* oz/1000 sq ft.

Heritage is also referred to as Azoxystrobin



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