

# Orange Rust of Sugarcane: Its Importance and Control

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# Sugarcane Rusts



**Brown Rust**



**Orange Rust**

# Comparison of Sugarcane Rusts

## *Brown Rust*

### **Uredinia (Pustules)**

- Reddish-brown
- Elongate



## *Orange Rust*

### **Uredinia (Pustules)**

- Orange-brown
- More oval



# Comparison of Sugarcane Rust Spores

*Brown*

*Orange*

# Comparison of Sugarcane Rust Spores

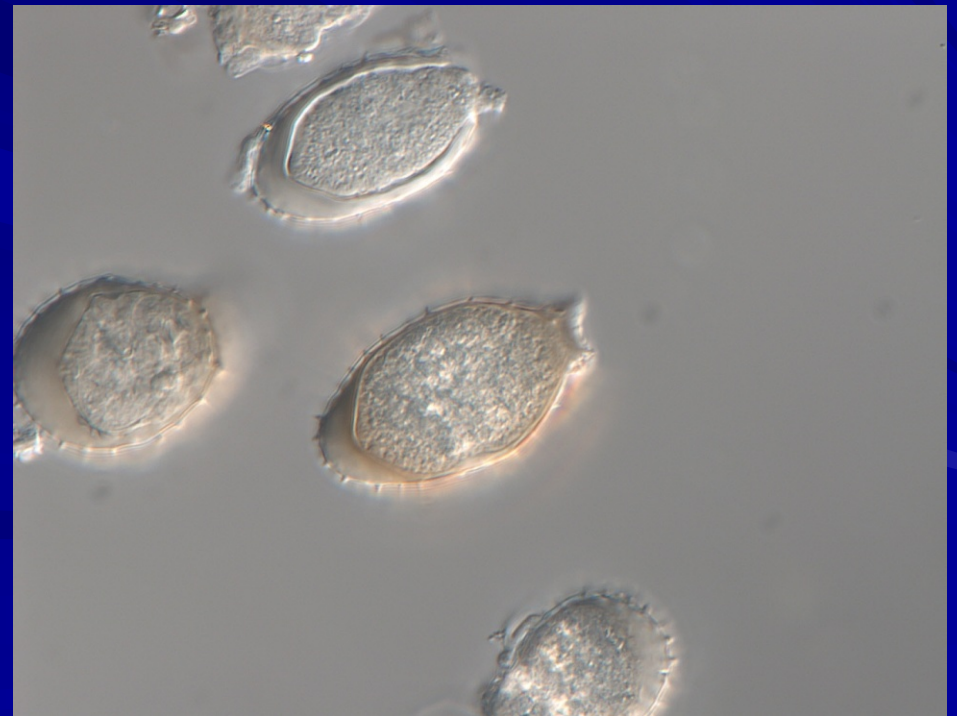
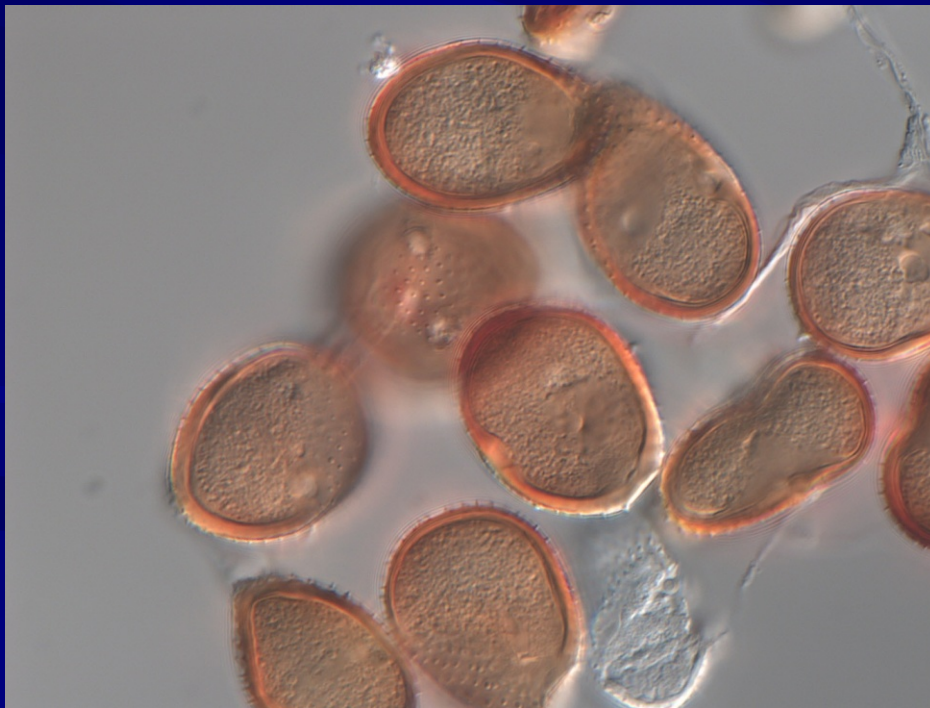
*Pictures by Lisa Castlebury*

***Brown rust spores***

***Orange rust spores***

■ **Wall 1.5  $\mu$  thick**

■ **Thickened at apex**



# Sugarcane Rusts

- Orange and brown rusts are favored by different temperatures, which affects the time of the season during which they predominate.
- Brown rust (moderate temperatures) is favored in the spring, mostly March-May.
- Orange rust (warm temperatures) is favored in early summer through fall (June-November).

# Orange Rust in Florida

## A brief history

### (2007)

- First observed in June 2007
- Infections observed on CP80-1743, CL85-1040 and CP72-2086
- Epidemic lasted through summer, into harvest
- Rust severities in Sept. of 24%
- Initial fungicide efficacy trials demonstrated promise
- Commercial yield losses suspected

# Orange Rust in Florida

## A brief history

### (2008)

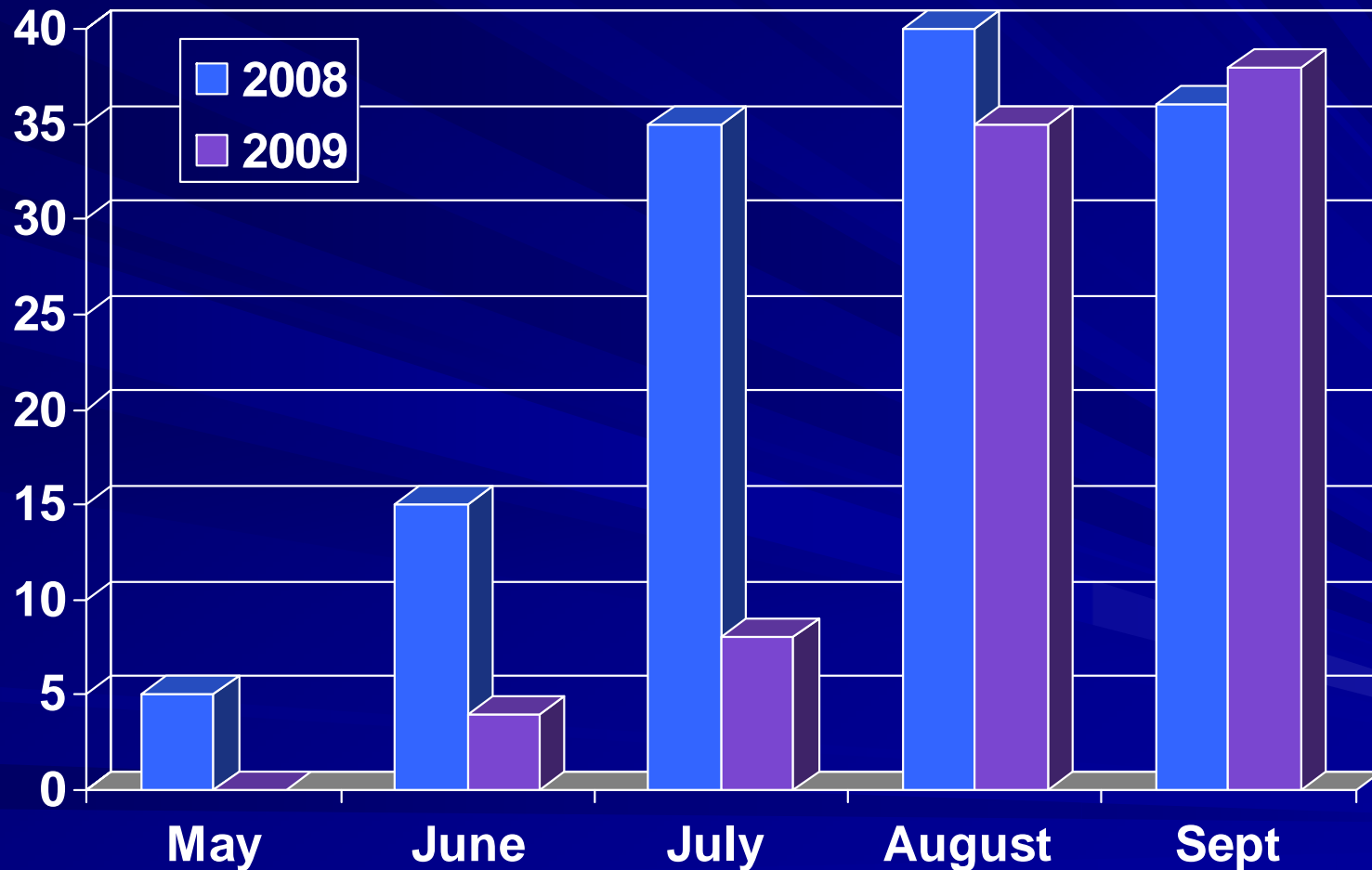
- Infections observed in early May
- Infections observed on CP80-1743, CL85-1040, CP72-2086, and eventually CP89-2143
- Epidemic lasted from early summer through harvest
- Rust severities ranging as high as 30-40%
- Pyraclostrobin and metconazole approved for use
- Commercial yield losses confirmed



# Orange Rust in the Americas

Location	Detected
United States (Florida)	2007 (June)
Costa Rica	2007 (August)
Guatemala	2007 (September)
Nicaragua	2007 (September)
Cuba	2008
Mexico	2008 (July)
Panama	2008 (February)
El Salvador	2008 (February)
Jamaica	2008
Belize	2009
Brazil	2009 (December)

# Orange Rust Severities 2008 vs 2009



# Host Plant Resistance

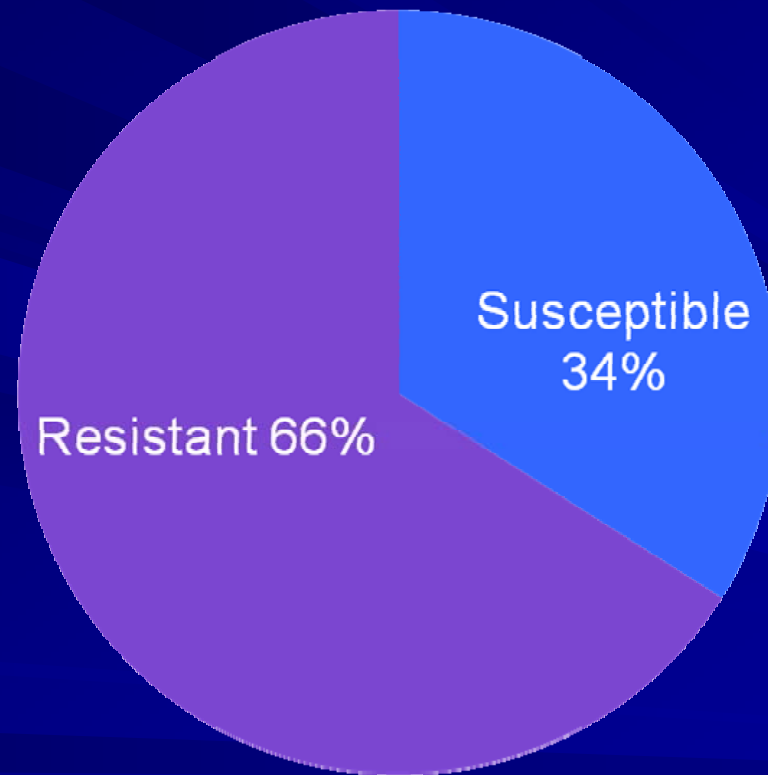


# Host Plant Resistance

Year	Commercial Varieties With Pustules
2007	CP80-1743, CP72-2086, CL85-1040
2008	CP80-1743, CP72-2086, CL85-1040 CP83-2143, CP78-1628
2009	CP80-1743, CP72-2086, CL85-1040 CP83-2143, CP78-1628 CP88-1672

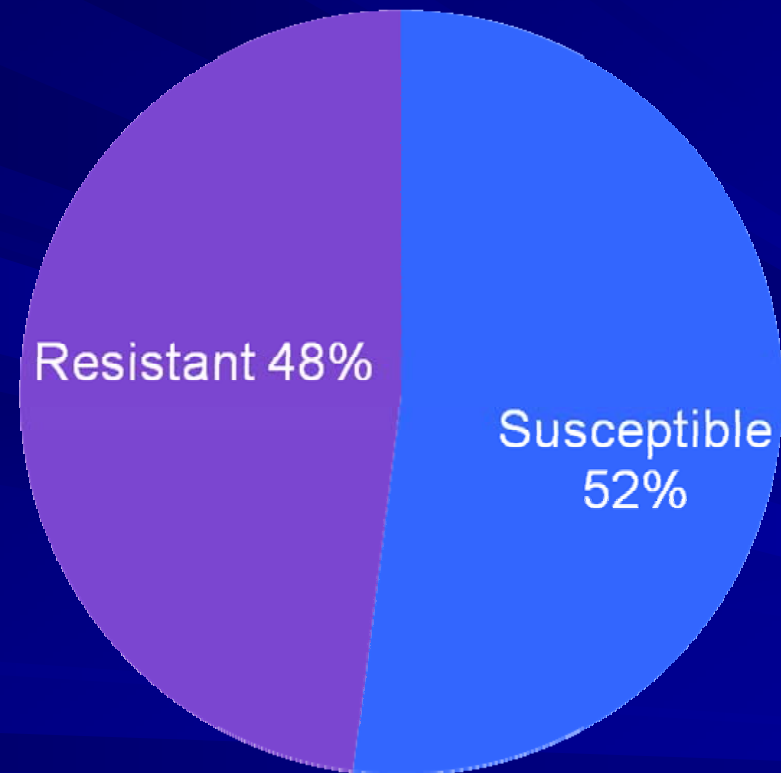
# Cultivar Susceptibility 2007

**% of Hectarage**



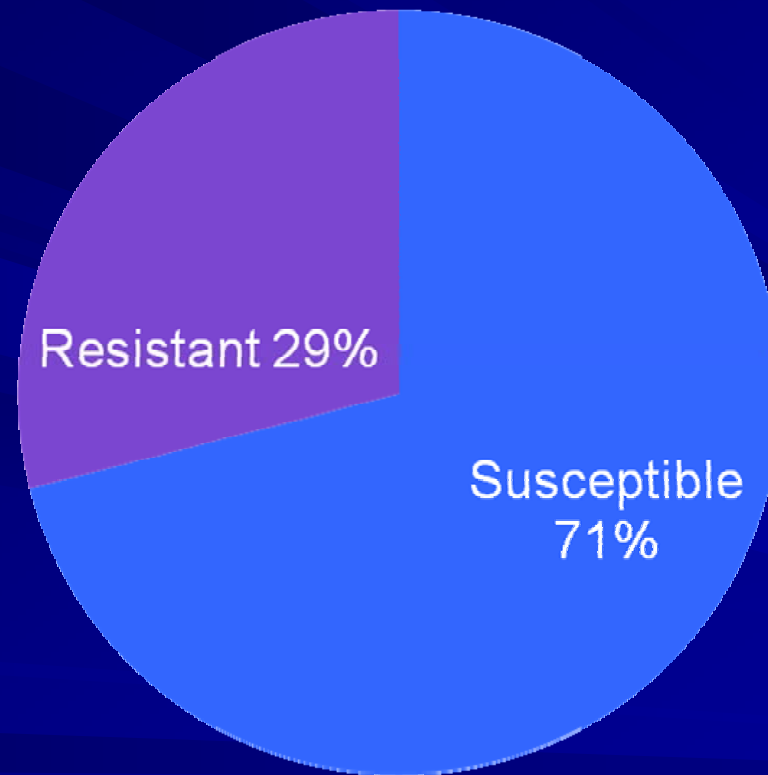
# Cultivar Susceptibility 2008

**% of Hectarage**



# Cultivar Susceptibility 2009

**% of Hectarage**



# Orange Rust Yield Loss Trial EREC - 2008

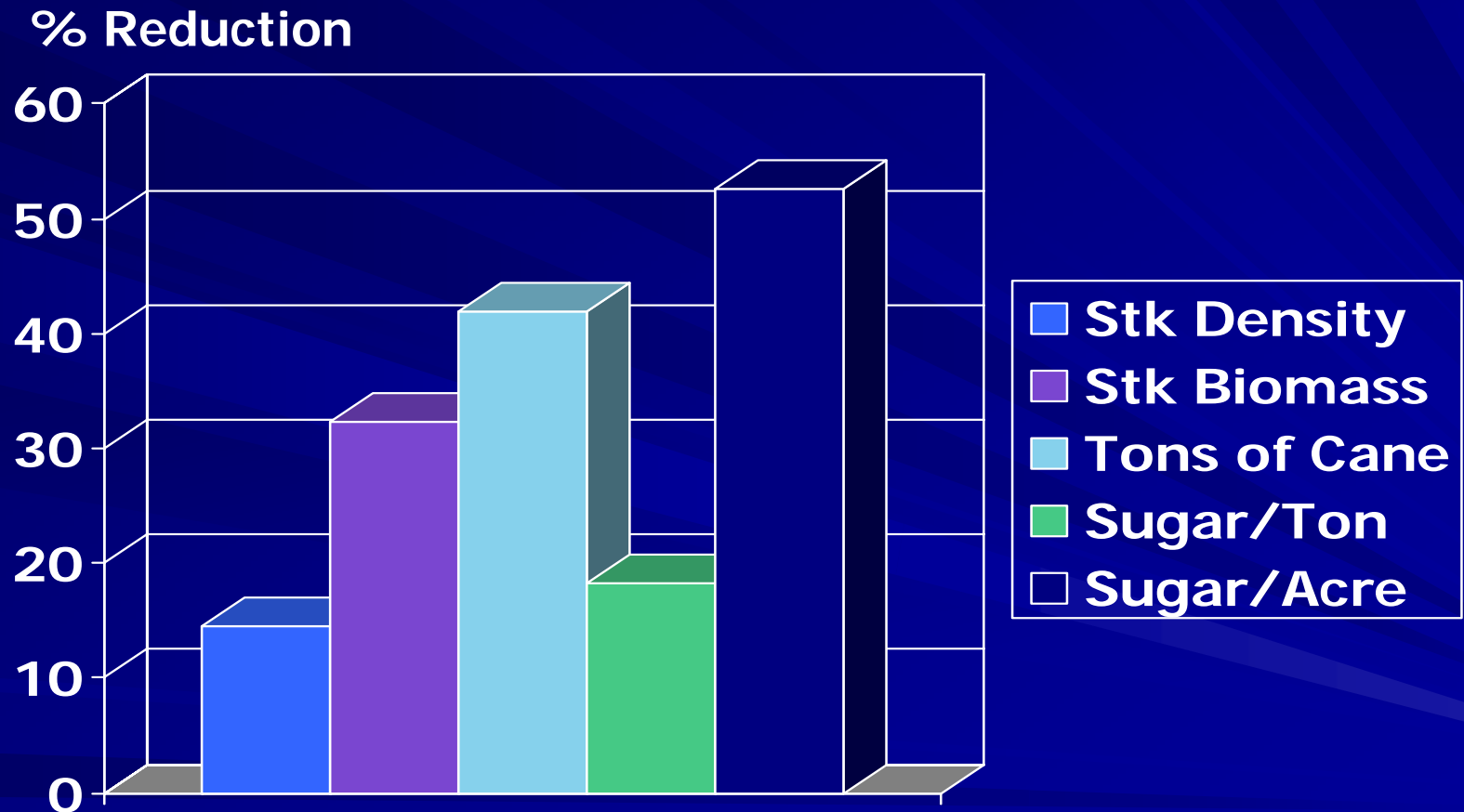






# 2008 Yield Components

## % Reductions – CL 85-1040



Yield component comparisons between the untreated check and the 7-day spray interval on CL85-1040, an orange rust susceptible variety.

# Orange Rust Fungicides 2008 Commercial Trials



**CP80-1743 on June 11**

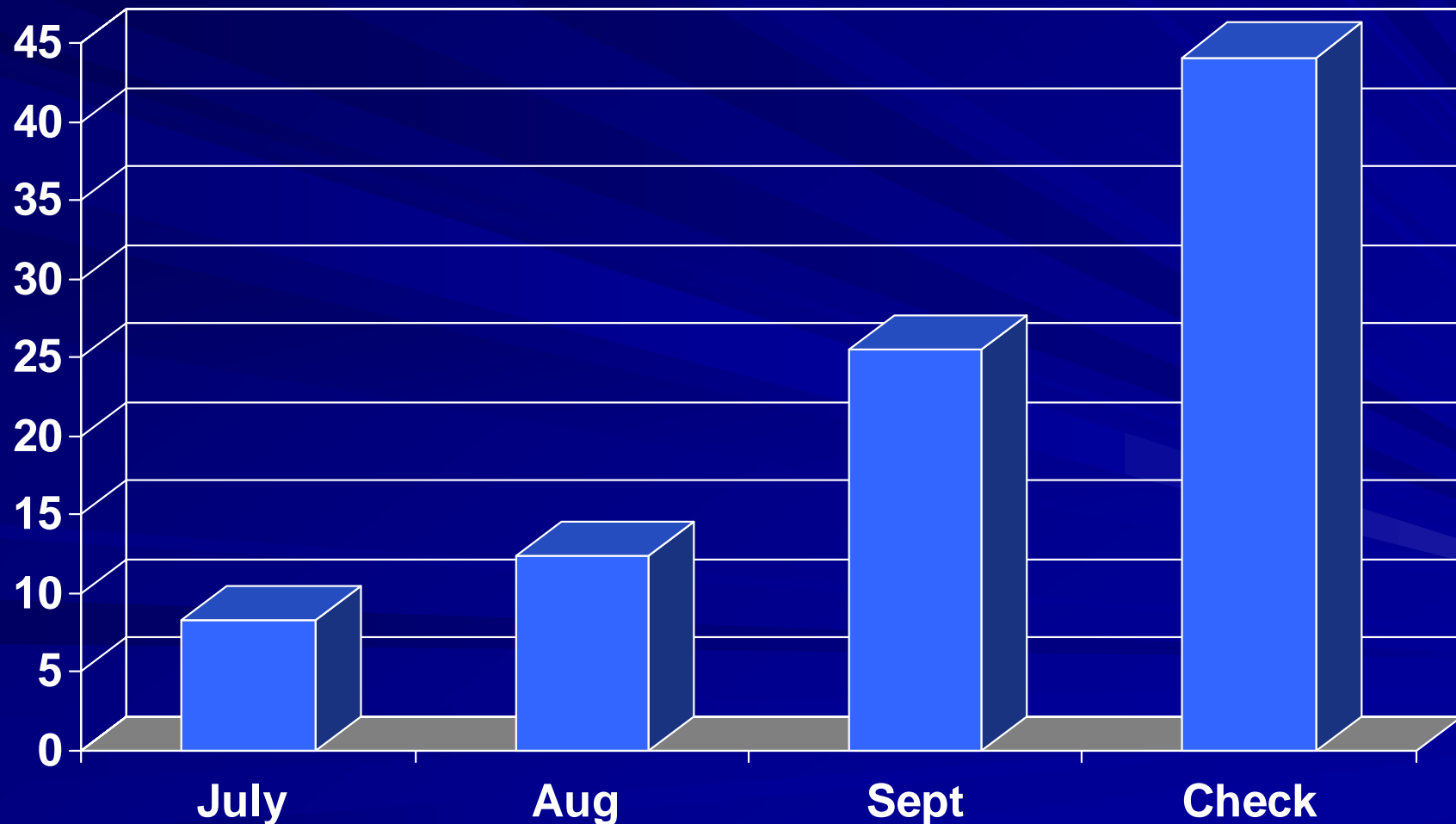
**Two pyraclostrobin applications**

**(10 oz on May 10, 12 oz on June 6)**

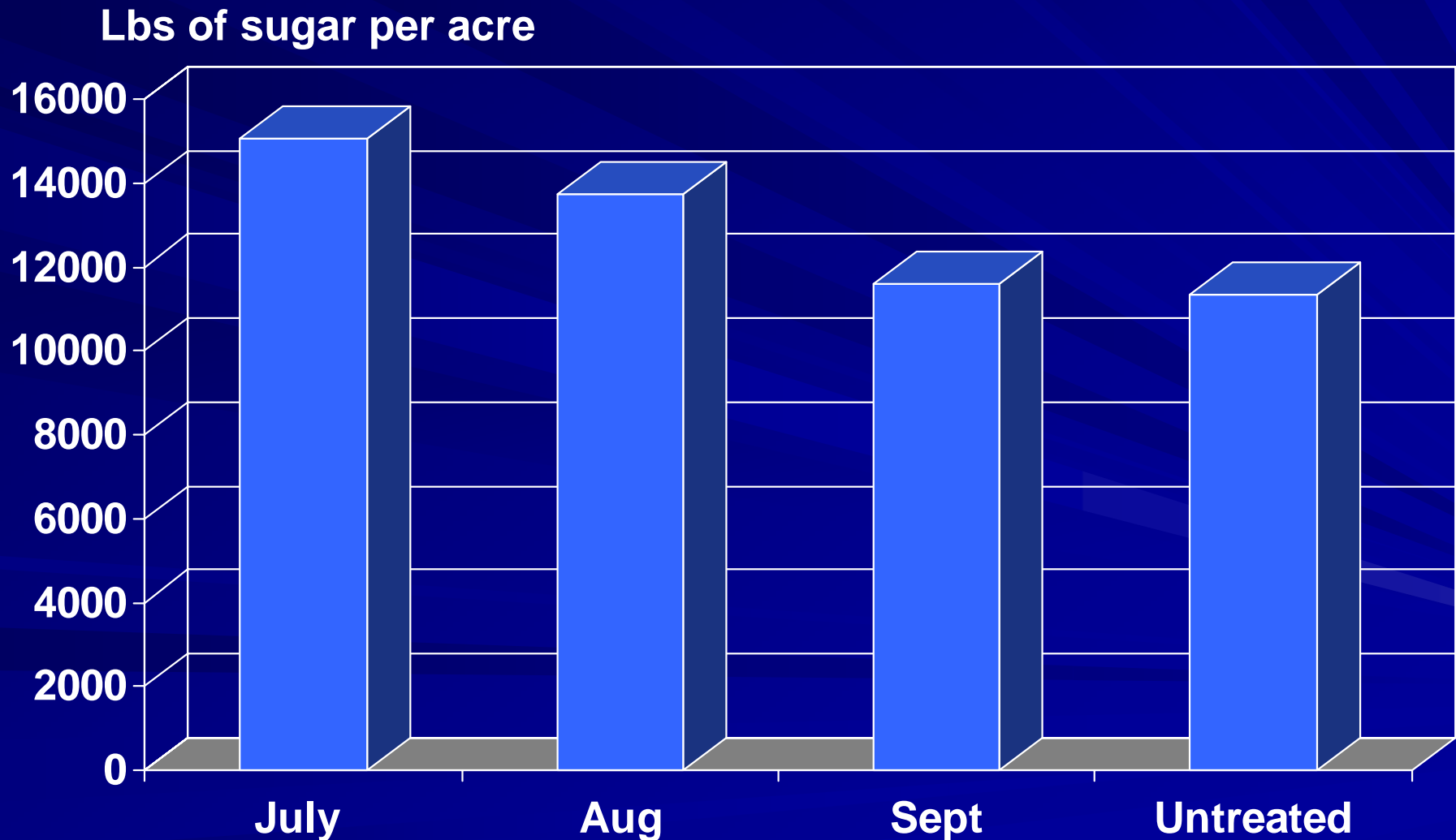
**Photo courtesy of J. Shine and Wedgworth Farms**

# Influence of fungicide initiation on orange rust severity in CL85-1040 during 2009

*% Rust Severity (upper half canopy)*



# Influence of fungicide initiation on sugar yield of CL85-1040 during 2009



# Sugarcane Orange Rust

## Conclusions

- Due to its long-distance spread capabilities, orange rust will likely spread to all sugarcane growing countries within the Americas.
- Host plant resistance is available but may not be stable due to the presence of rust variants.
- Given favorable conditions, orange rust is capable of causing yield losses in excess of 50%.

# Sugarcane Orange Rust

## Conclusions

- Controlled temperature studies show OR to be favored by temperatures of 20-25 C.
- These studies will prove valuable in defining “risk zones” for potential management.
- Fungicides, particularly strobilurins and triazoles, have demonstrated efficacy.
- However, chemical control should be viewed as only one tool in a multi-pronged management program.

# Acknowledgments

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**THANK YOU!**