Yield Loss Incited by Orange Rust on a Highly Susceptible Sugarcane Cultivar in Florida

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Sugarcane Rusts



Orange Rust



Brown Rust

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%
- Headline and Caramba approved for use
- Commercial yield losses confirmed

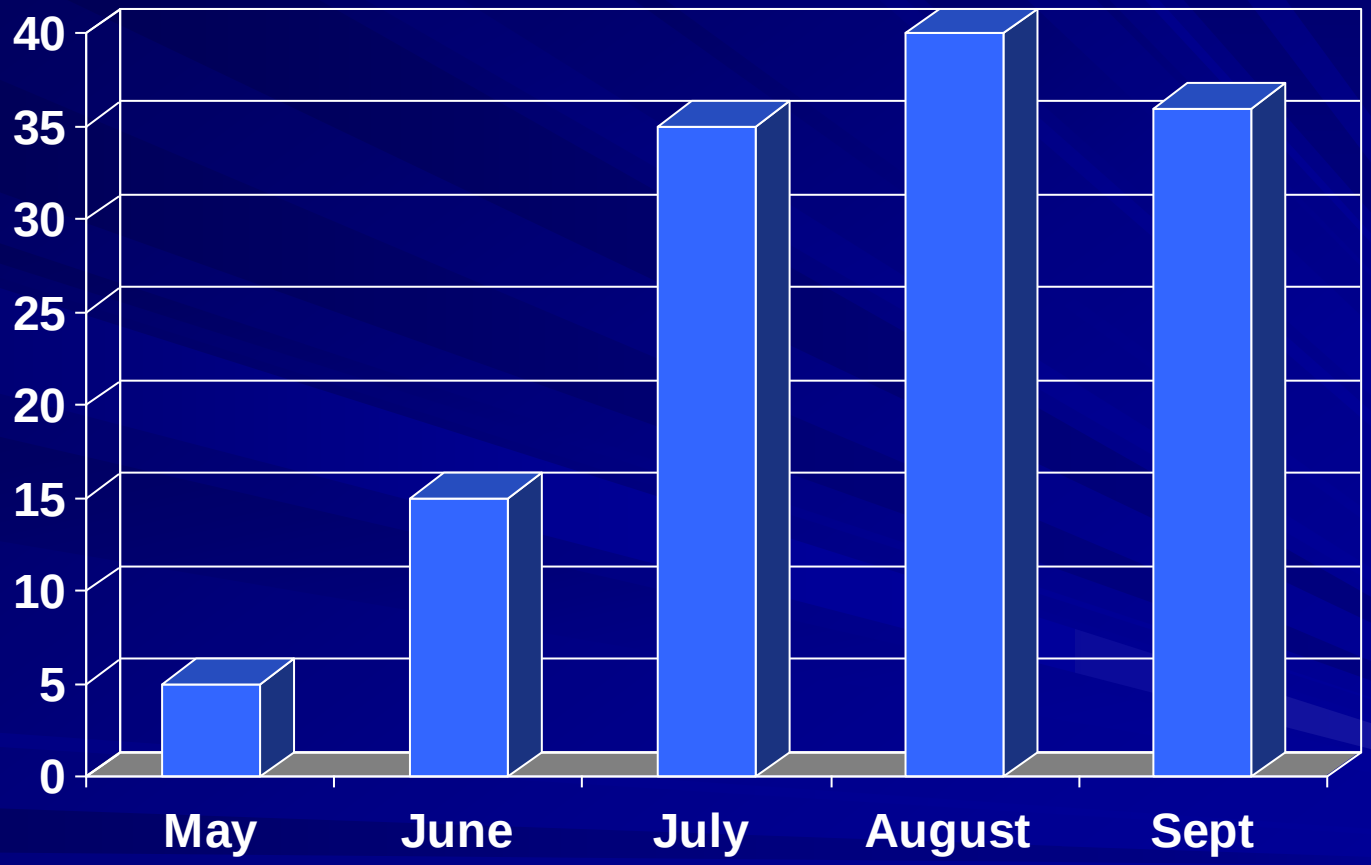
Orange Rust in Florida
A brief history
(2009)

- Late January freeze minimizes primary inoculum levels
- Infections observed in mid-July
- Infections now observed on an additional major cultivar, CP88-1762.
- Epidemic lasted from August through harvest
- Rust severities eventually range as high as 30-40%
- Many cane tops at harvest have very little green.

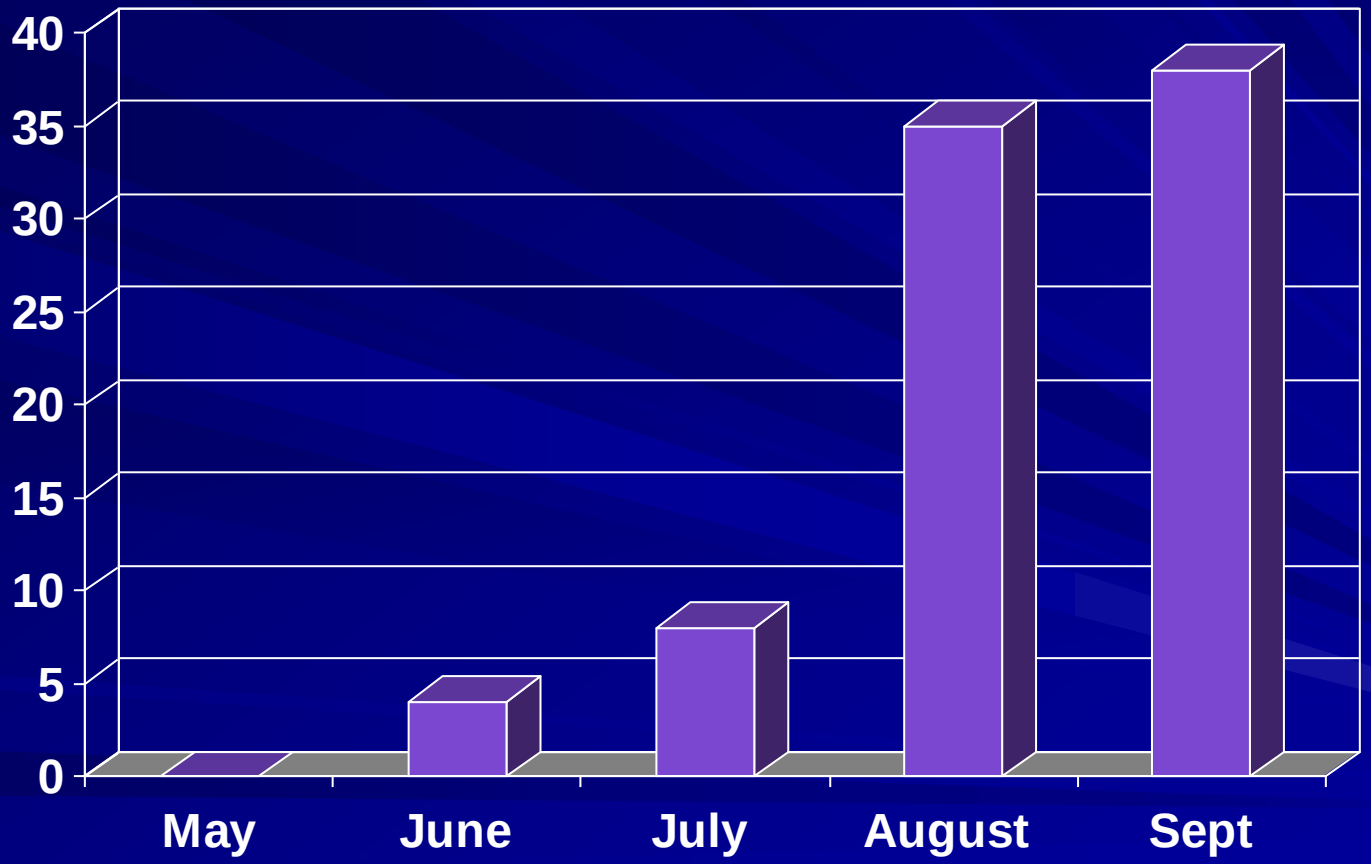
Orange Rust in Florida
A brief history
(2010)

- Infections noted in mid to late June
- Most of the major cultivars, CP80-1743, CP89-2143, CP88-1762, and CP78-1628 displaying some level of susceptibility.
- Infection seems to tail off during excessive heat in September and re-emerge in Oct-Nov.
- Early frost and freezes in Dec bring orange rust to a quick close.

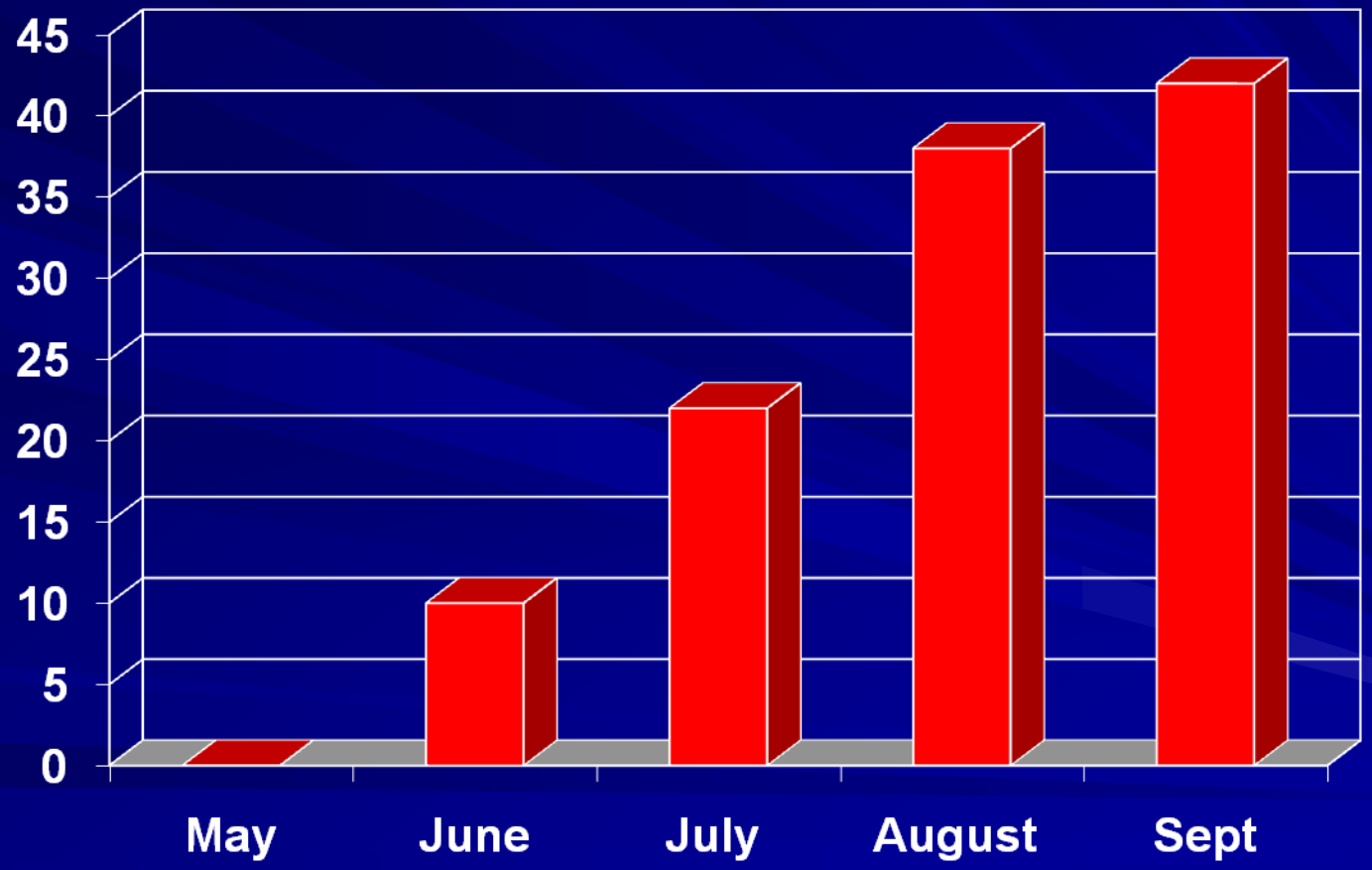
Orange Rust Severities 2008



Orange Rust Severities 2009



Orange Rust Severities 2010



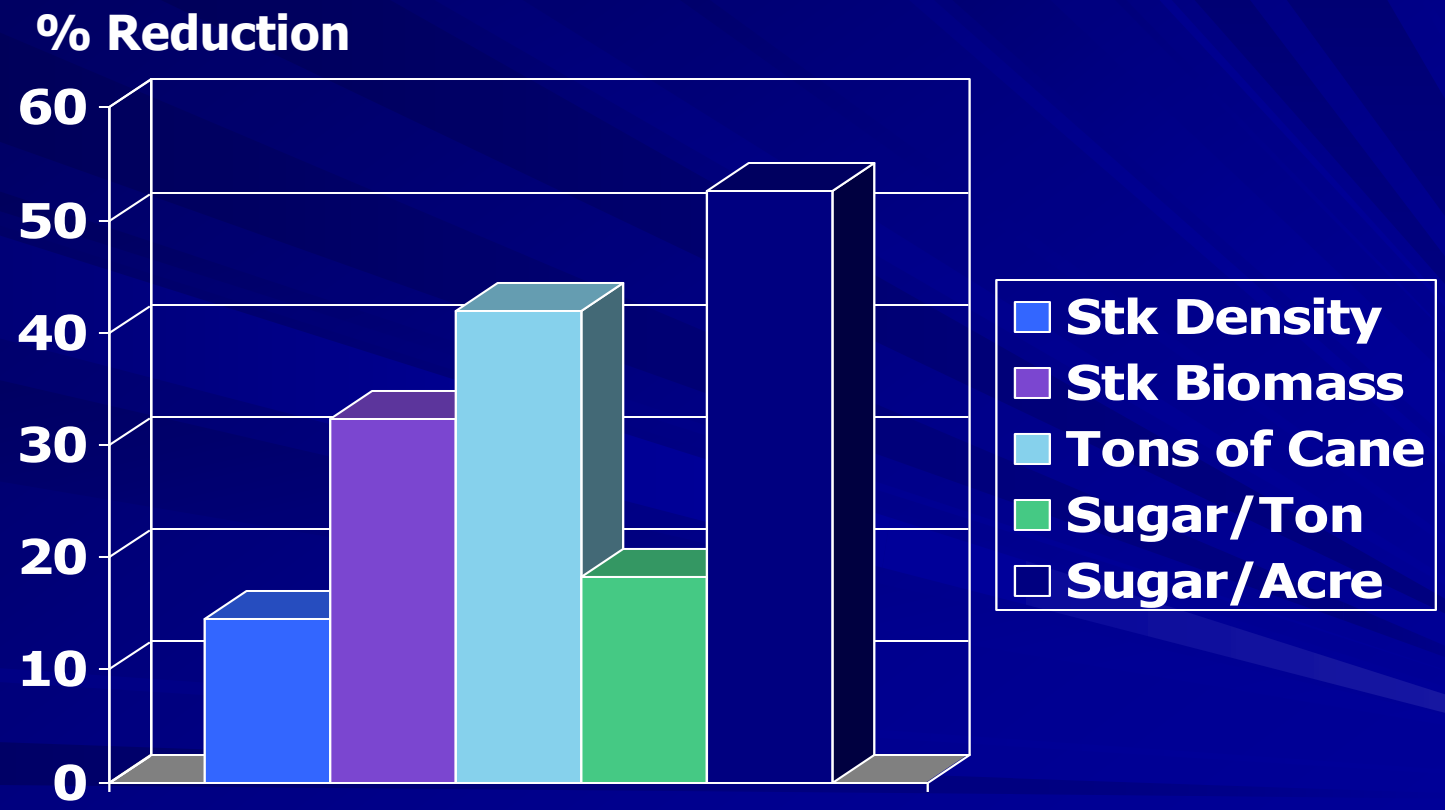
Orange Rust Disease Progress



Yield Loss Trials

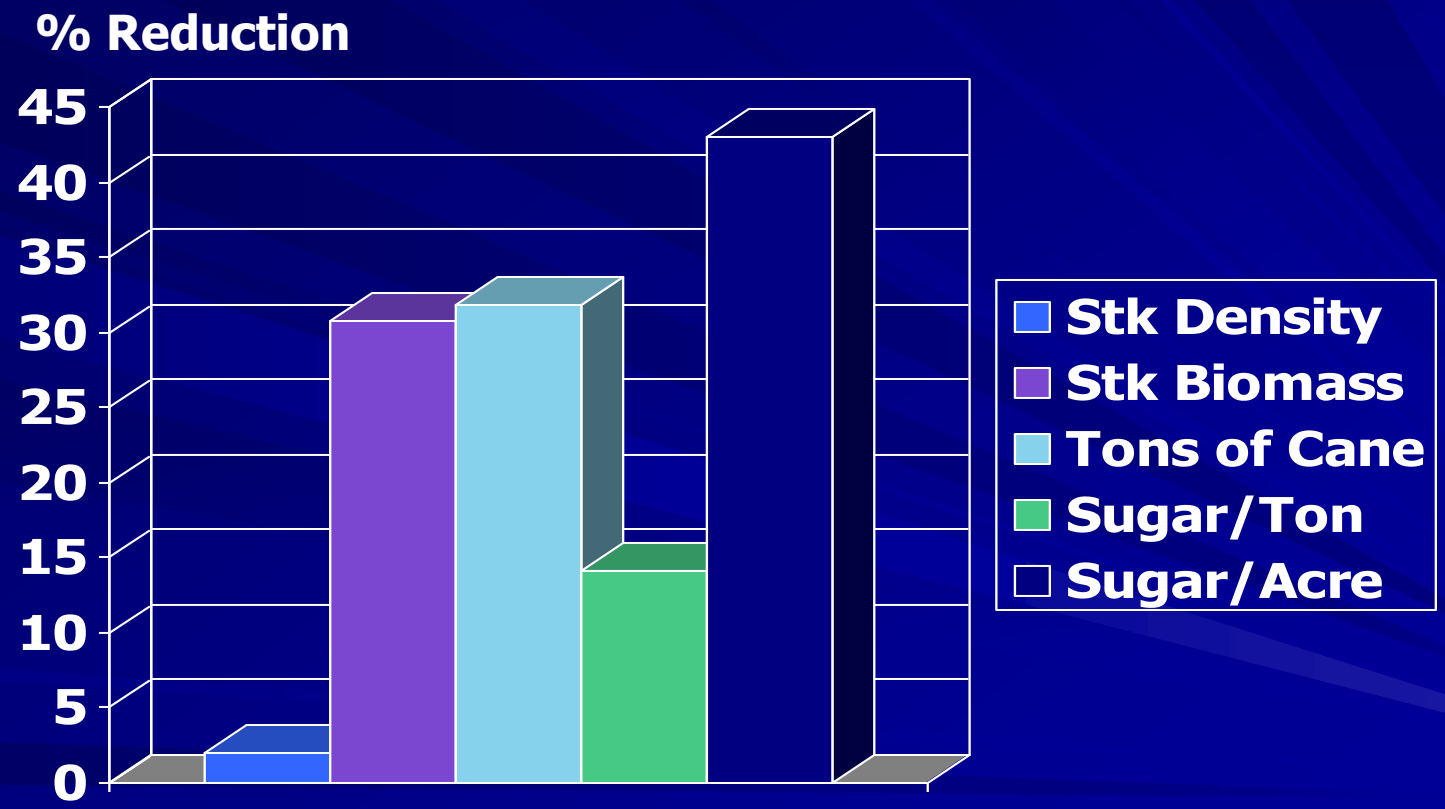
- Replicated field trials comparing nonsprayed checks with plots maintained nearly rust-free using Headline at approx. weekly intervals.
- Sprays maintained from initial observation until October when spraying was no longer possible.
- Data collected on stalk population, stalk biomass, and sucrose concentration using small plot techniques.

2008 Yield Components
% Reductions – CL 85-1040



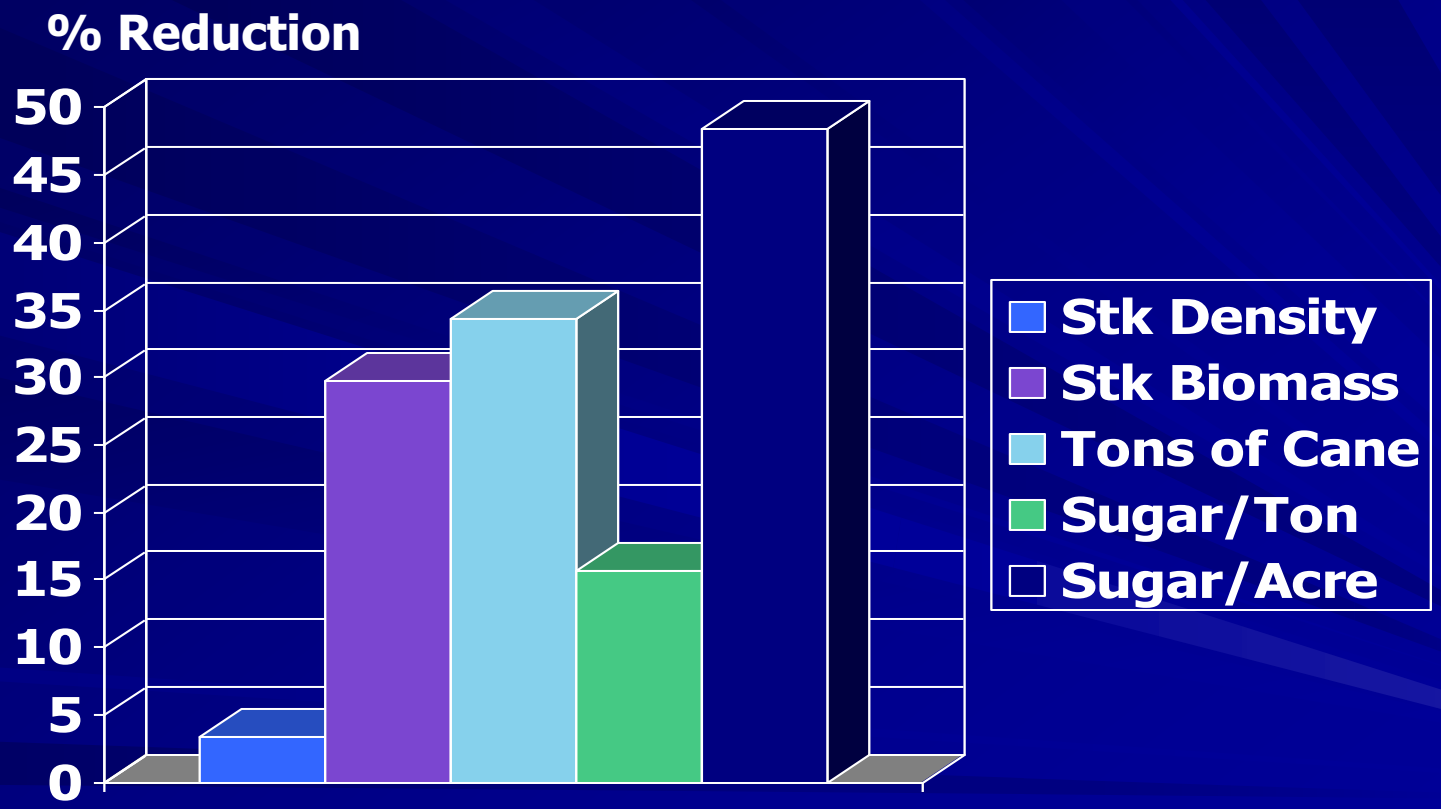
Yield component comparisons between the untreated check and the 7-day spray interval on CL85-1040, an orange rust susceptible variety.

2009 Yield Components
% Reductions – CL 85-1040



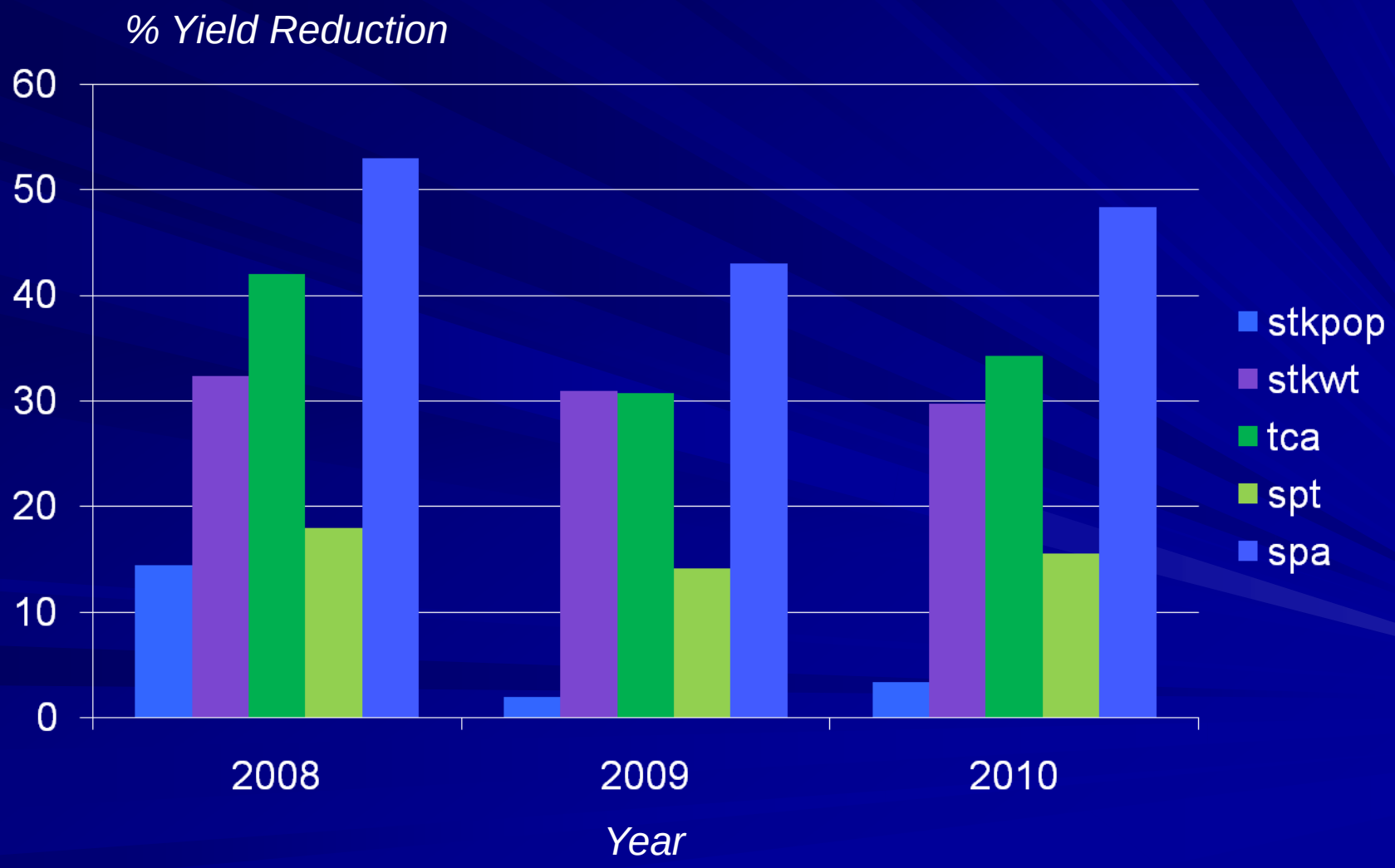
Yield component comparisons between the untreated check and the 7-day spray interval on CL85-1040, an orange rust susceptible variety.

2010 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.

Influence of Orange Rust on Yield Components



Orange Rust Yield Loss Trial
EREC - 2008




7 Day

Summary of Orange Rust Yield Losses on CL85-1040

- Losses ranged from a low of 43% in 2009 to as high as 53% in 2008.
- Losses related to the length of the epidemic.
- Cane biomass is the yield component most consistently and significantly impacted.
- Millable stalk populations only affected when epidemic starts early.
- Sucrose concentrations were significantly reduced during all three years of this study.

Summary of Orange Rust Yield Losses on CL85-1040

- Unlike brown rust, yield losses to orange rust are more of a certainty due to the width of the “window of susceptibility”.
- As high as these estimates appear, they may actually understate actual losses, as OR was not controlled during the later stages of the growing season.
- The significant level of these losses on a susceptible cultivar demonstrate the importance of breeding for host plant resistance.

Acknowledgments

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Questions?