

The Impact of CRF on Sugarcane Grown on Mineral Soils in Sub-Tropical Conditions

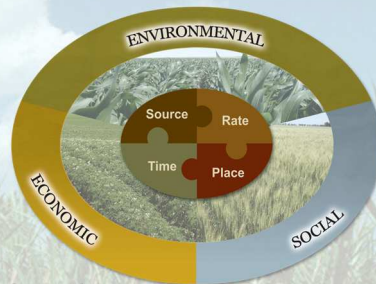
IFA New/Ag Presentation
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Improving the Efficiency of Fertilization

Can CRF work in Sugarcane?

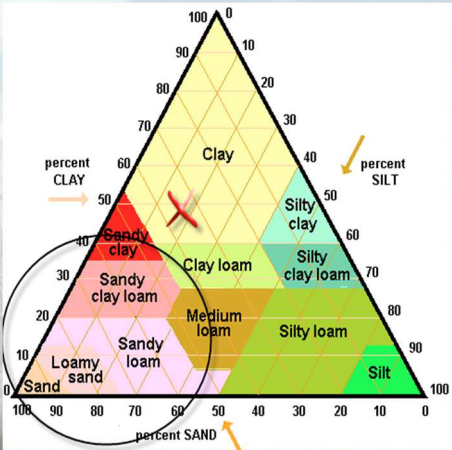
- Source of Nitrogen
- Rates
- Timing of application(s)
- Cost
- Method and placement of fertilizer
- Efficiency



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Soil Conditions

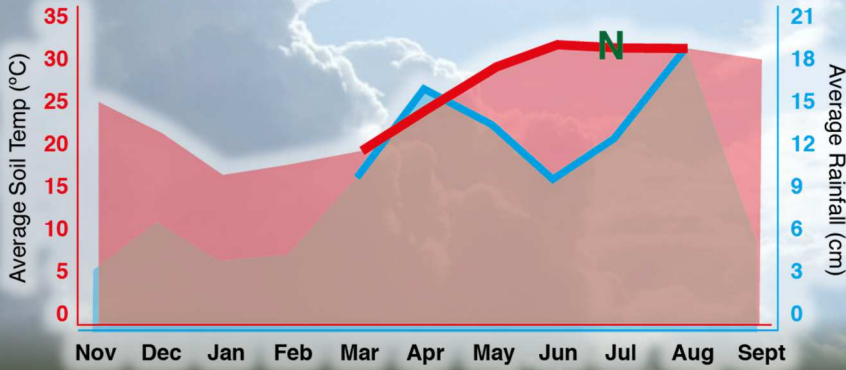
- Sugarcane is grown on 40,000+ hectares of mineral (sand) soils in South Florida near environmentally sensitive wetlands (Everglades).
- Approx. 1.2 million metric tons of cane are produced, requiring 3.4 million metric tons of Nitrogen



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Weather Conditions

South Florida experiences heavy rainfall and high temperatures during the summer.



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Commercial Production Trials

- 60+ hectares at US Sugar Corporation in Clewiston, FL from 2009-2013.
- Data: yield, stalk size, count and, tissue
- One application in the furrow.



Control vs. CRF Fertilizer Programs

<u>Type</u>	<u># Apps</u>	<u>N Source</u>	<u>CostN/Hectare</u>	<u>N rate(kg)/Hectare</u>	<u>Total Fertilizer</u>
Control	5	Amm. Nitrate	\$428.55	112	680kgs
CRF	1	Amm. Nitrate	\$423.75	73.5	544kgs



Yield Data

2009/2010 Crop Year (averages)					
Treatment	Metric Tons Per Hectare	Trash	Net Metric Tons/Hectare	Sucrose	Net Std Metric Tons/Hectare
Control	77.25	5.28%	73.17	14.94%	91.46
CRF	75.68	5.28%	71.69	16.13%	98.57

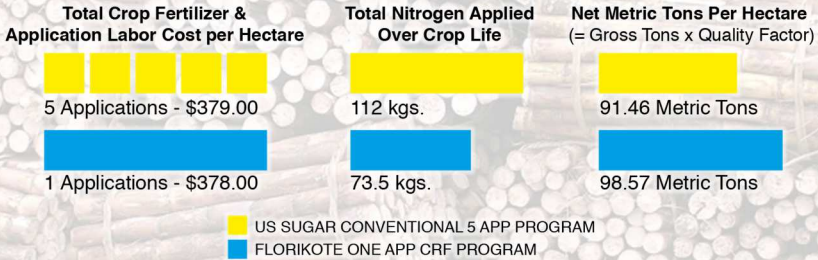
2010/2011 Crop Year (averages)					
Treatment	Metric Tons Per Hectare	Trash	Net Metric Tons/Hectare	Sucrose	Net Std Metric Tons/Hectare
Control	80.63	5.28%	76.37	16.88%	110.74
CRF	81.08	5.28%	76.80	16.79%	111.37

2012/2013 CRF Program Input Reductions (400 Hectares)					
Kgs. Fertilizer Reduced:		90,719	Kgs. Nitrogen Reduced:		30,844

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Results

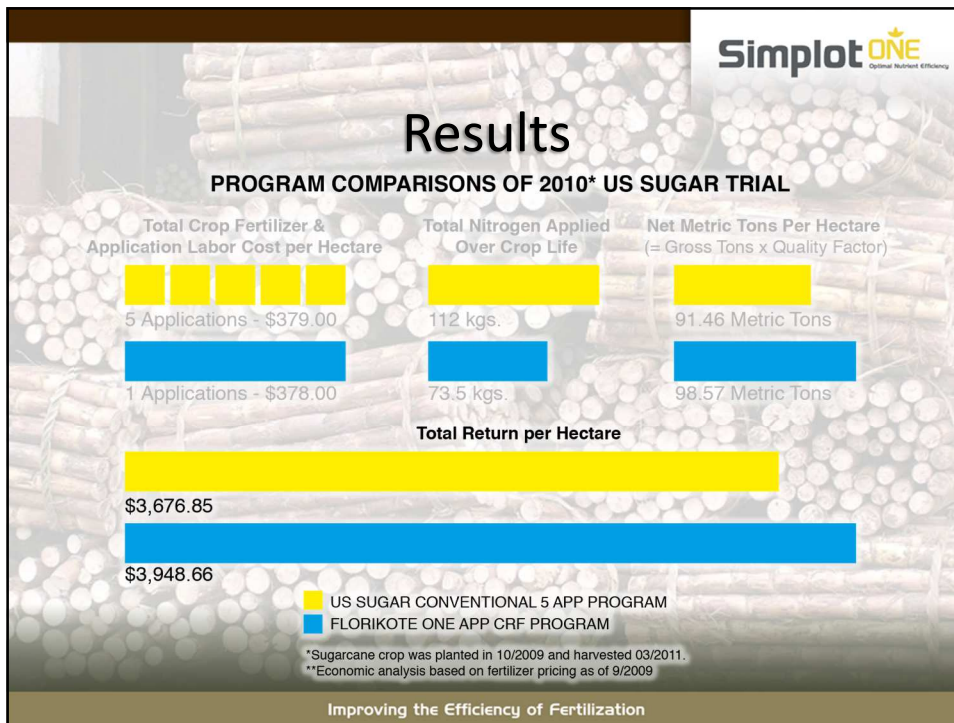
PROGRAM COMPARISONS OF 2010* US SUGAR TRIAL



*Sugarcane crop was planted in 10/2009 and harvested 03/2011.
**Economic analysis based on fertilizer pricing as of 9/2009

Tissue nutrient levels, counts, and stalk size are statistically similar

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Nitrogen Efficiency
2010/11 crop year production

- CRF = **1.93** kg N per metric ton of sucrose
- Control = **2.7** kg N per metric ton of sucrose
- A **30%** increase in efficiency

US Sugar received a 4R Advocate Award from The Fertilizer Institute in 2012

Improving the Efficiency of Fertilization

Eco-Efficiency Study

- Analyzes full lifecycle efficiency
- Accounts for emissions from manufacturing, transportation, and application.



Submission for
Verification of Eco-efficiency Analysis Under
NSF Protocol P352, Part B

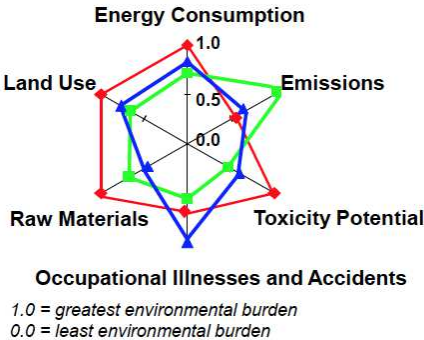
Controlled Release Fertilizers
Eco-efficiency Analysis
January 2013



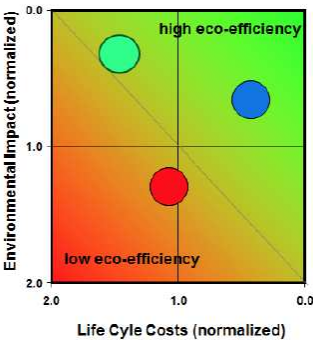
Submitted by:
BASF Corporation
100 Park Avenue, Florham Park, NJ, 07932

Eco-Efficiency Scoring Example

Environmental Fingerprint



Eco-efficiency Portfolio



Perfect Fit for CRF in Tropics

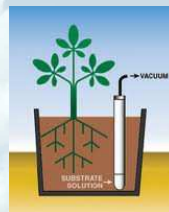
- Long term crops with 3+ dry N treatments
- Roots are difficult to access with fertilizer
- Heavy rain and high temperatures
- Porous soils or low CEC



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Future Studies

- Water Quality/Leachate
 - Use of lysimeters
- 5 years of continuous CRF use on tree crops:
 - Cumulative Yield
 - Labor and management time
 - Disease and pest resistance
 - Total reduction in kgs of fertilizer and emissions



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Conclusion / Q&A

Thank You Rosa Muchovej, US Sugar
& Brian Patterson, Florikan

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