

- **It appears that there is little difference in nitrogen requirements for plant-cane and first-stubble crops; however, slightly more nitrogen might be needed for the first-stubble crop. Additional nitrogen fertilizer is indicated for second- and older stubble crops.**
- **Results from the 2008 crop year clearly show that the yields of sugar per ton decrease with increasing nitrogen rate. Higher than needed nitrogen rates may increase tons of cane, but also decrease sugar per ton. Applying the recommended levels may allow producers to achieve equivalent sugar per acre yields with fewer tons of cane.**
- **Preliminary data from 2008 suggest that stubble cane harvested early in the season may benefit from slightly higher nitrogen levels, as compared to cane harvested later in the season. It appears that the additional nitrogen increases tonnage, while not significantly influencing sugar per ton. Note that these results are preliminary and will be confirmed in 2009 trials.**
- **Using nitrogen fertilizer rates higher than recommended as ‘insurance’ may not be cost effective in the long term, especially with the high cost of nitrogen.**
- **Higher than needed nitrogen rates can also contribute to excessive lodging and, perhaps, delayed maturity and lower cane quality.**
- **Important: With the high cost on nitrogen fertilizer, it is recommended that nitrogen be applied when the crop is actively growing; don’t fertilize too early. For greatest efficiency, previous research has shown that optimal**



nitrogen utilization occurs when applied between April 1 and April 30. However, recent research results from a study conducted at St. Gabriel demonstrate that nitrogen can be applied as late as May 14 with equally good sugar yields. Nitrogen applied earlier than April 1 has the potential to be lost due to leaching and denitrification. It can also stimulate early weed growth. One can help improve the efficiency of early applications with the use of time-released nitrogen forms; however, these forms are more costly. If nitrogen is applied before crop is actively growing, consider monitoring leaf nitrogen status until jointing occurs.

- **According to Drs Jeff Hoy, LSU Ag Center, and Rich Johnson, Mike Grisham and Edward Richard, USDA-ARS, Sugarcane Research Laboratory, there might be an association of common rust severity and high levels of nitrogen, phosphorus and/or sulfur.**

POTASSIUM (K_2O) (lb/A)

Current Recommendations

Soil test	Plant-cane	Stubble-cane
Very low	120	140
Low	110	120
Medium	80	80
High	0	0
Very high	0	0

- **Recommendations based on results of soil tests.**
- **Sugarcane utilizes approximately 3 lb of K per ton of cane**
- **Natural abundance and availability depends on soil type.**

PHOSPHOROUS (P_2O_5) (lb/A)

Current Recommendations

<u>Soil test</u>	<u>Plant-cane</u>	<u>Stubble-cane</u>
Very low	50	60
Low	45	50
Medium	40	40
High	0	0
Very high	0	0

- **Recommendations based on results of soil tests.**
- **Sugarcane utilizes approximately 1 lb of P per ton of cane with availability dependent upon soil pH & soil type.**

SULFUR (S) (lb/A)

Current Recommendations

<u>Soil test</u>	<u>Plant-cane</u>	<u>Stubble-cane</u>
Low	24	24
High	0	0

- **Recommendations based on results of soil tests.**
- **Stubble cane more likely to respond than plant cane.**
- **Response more likely on medium-heavy to heavy textured soils.**

MICRONUTRIENTS

Zinc (Zn) and Copper (Cu): Apply only if soil tests or tissue analyses indicate deficiencies. There are no specific recommendations for applying either Zn or Cu; however, tests conducted in 2003 suggest that silt loam soils testing low in Zn and Cu did show a significant yield response with additions of 4 lb/A of Zn and 2 lb/A of Cu as sulfates. However, tests conducted in 2004 did not show the same responses when applied as chlorides.

Silica (Si): The concentration of Si in Louisiana mineral soils has not been directly correlated with the need for Si fertilization; therefore, there are no specific recommendations for the use of silica in Louisiana at this time. However, research has shown that soils receiving calcium silica slag at the rate of 2 tons per acre produced higher amounts of sugar and cane per acre as an average of plant-cane and three stubble crops when compared to the control and limed plots. The level of silica in these tests was 60-63 ppm which is considered low by industry standards using the acetic acid extraction protocol.

LIMING

Experiments and experience show that the proper use of lime, where needed, consistently results in higher yields. The best method of checking lime requirements is to conduct soil tests. Liming is primarily a method of correcting soil acidity, but there are several other benefits to include:

- **To supply calcium, and essential plant food nutrient.**
- **To reduce aluminum and manganese toxicity.**
- **To correct Magnesium deficiencies (Dolomitic Lime, i.e. $MgCO_3$ vs. $CaCO_3$).**
- **To enhance the activity of soil microorganisms.**
- **To improve the activity of soil applied herbicides.**
- **To improve fertilizer use efficiency by maximizing nutrient availability.**

Soil pH is the most important single influence over the availability of plant food nutrients to growing crops and thus the efficiency with which crops make use of fertilizers. Recent studies by USDA-ARS personnel indicate that uniform and variable rate lime application significantly improved cane and sugar yields (2,994 lbs sugar and 14 tons of cane over a 3-year crop cycle). They showed that variable rate lime application also reduced the total lime applied as compared to uniform application.

The two most commonly used liming materials are ground agricultural limestone and ground dolomitic limestone. Dolomitic limestone supplies magnesium as well as calcium. Calcium silica slag is another source of liming material containing silica.

When and How Should I Apply Lime?:

Lime when:

- **Soil pH < 5.8 on sandy loam & silt loam soils.**
- **Soil pH < 5.2 on clay loam & clay soils.**
- **Broadcast lime to fallow fields, or in fall or winter.**
- **The lime rate should be based on soil test and ideally should raise soil pH to 6.5.**
- **Apply lime after precision leveling.**
- **Variable rate lime application may more accurately target problem pH areas and ultimately save money.**

How Long Will It Take for Lime to Work:

- **The biggest change will occur within 3-4 months. The pH may continue to increase for 6-12 months.**
- **Smaller lime particles, will react more quickly than larger particles. Larger particles will not change soil pH as quickly, but may provide pH control (buffering capacity) over a longer period of time.**



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