# FERTILIZER STUDIES ON SUGARCANE IN 2005

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Two new varieties, L97-128 and Ho95-988, were compared with LCP85-384 for response to applied N in a plantcane study on medium textured soil. The results of this experiment underscored the general lack of response to inputs by plantcane crops as no variety showed significant trends with increasing N application rate. The new varieties produced greater sugar yields across all applied N rates compared to LCP85-384 (Fig. 1). Response to applied N in first ratoon was similar for CP70-321, HoCP85-555 and LCP85-384 (Fig. 2). Optimum sugar yields occurred within the 80-100 lb. applied N/ac recommended for LCP85-384. The data indicate the possibility that the reduction of N rate recommended for LCP85-384 is due more to changes in N application rate philosophy than in biological differences among old, contemporary, and newer varieties.

The use of slow release N (Nitamin) or N Stabilized with urease and nitrification inhibitors (Super U) as a complete winter broadcast or split half with a spring application of UAN was studied with two harvest residue managements (burning or left undisturbed). Only cane under the burn management produced significant differences among N treatments with Nitamin producing the numerically highest yields when broadcast in January (Fig. 3). The results suggest that broadcast winter application of fertilizer that is of a slow release or stabilized type may be a viable alternative to spring applied conventional N fertilizer. Cost would be the determining factor.

Nitrogen amendment by soil or foliar methods of a sugarcane crop found to be below the critical nutrient range was tested on first ratoon LCP85-384. Yields were low across all treatments making it difficult to assess response to mid-season amendment (Fig. 4).

The effect of slow release N fertilizer (Nitamin) compared to conventional UAN on sugar yield of first ratoon LCP85-384 was tested. Sixty lbs. of N as slow release Nitamin produced numerically higher yields than 100 lb. N as conventional UAN, but the 40 lb N/a Nitamin was the least effective (Fig. 5.). This experiment was in the same field as the low N amendment experiment and suffered from overall low yields.

A study on soil/foliar supplements/additives to normal fertilization on three varieties indicated no significant positive response in sugar yield for any treatment compared to normal fertilizer input (Fig. 6). Regardless, the supplement HM9480B had an average sugar yield slightly higher than the check in all varieties and may reflect some response due to the cooler spring temperatures in 2005.

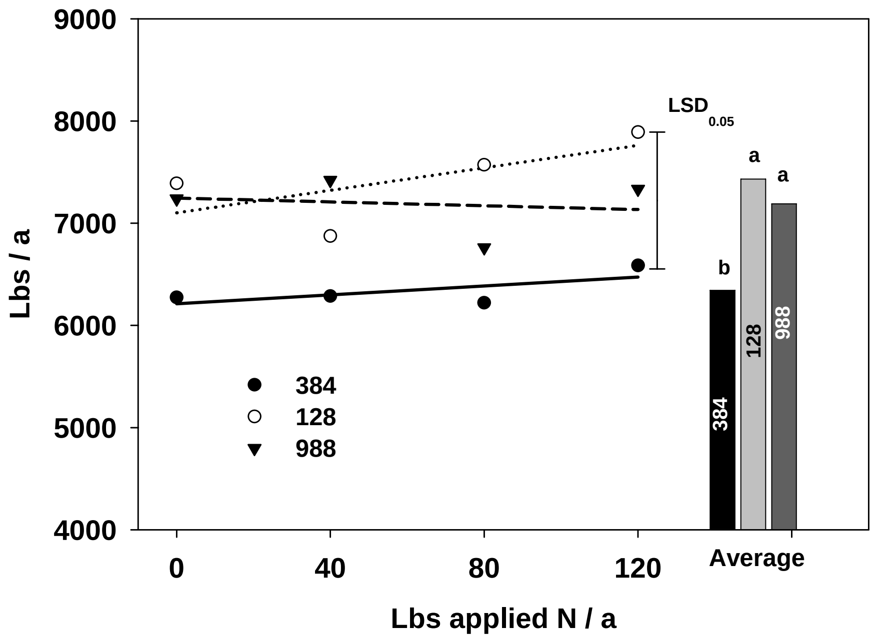


Fig.1. Variety x applied N rate test effect on sugar yield: Plant cane on medium texture soil.

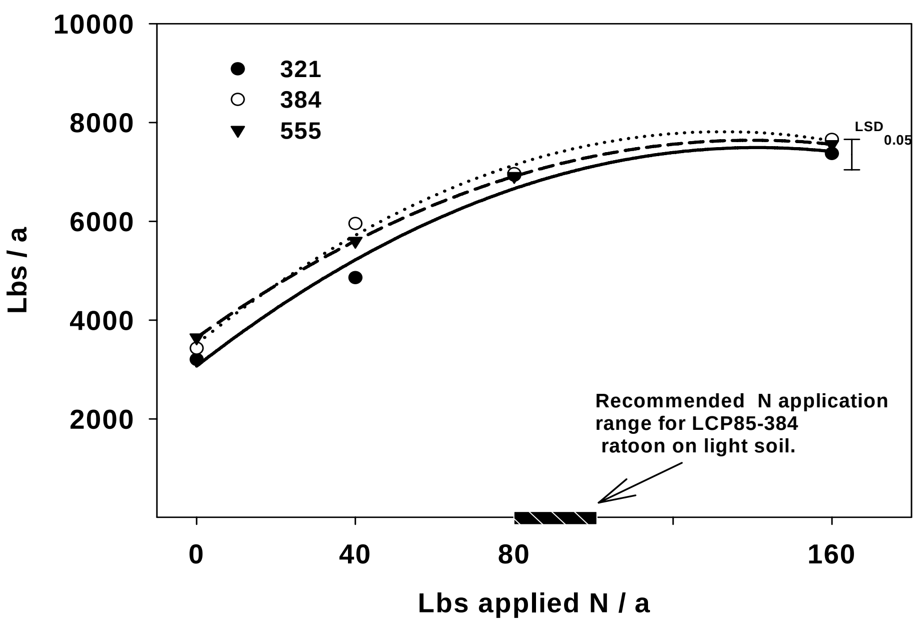


Fig.2. Variety x fertilizer N rate test effect on sugar yield: 1st stubble on light texture soil.

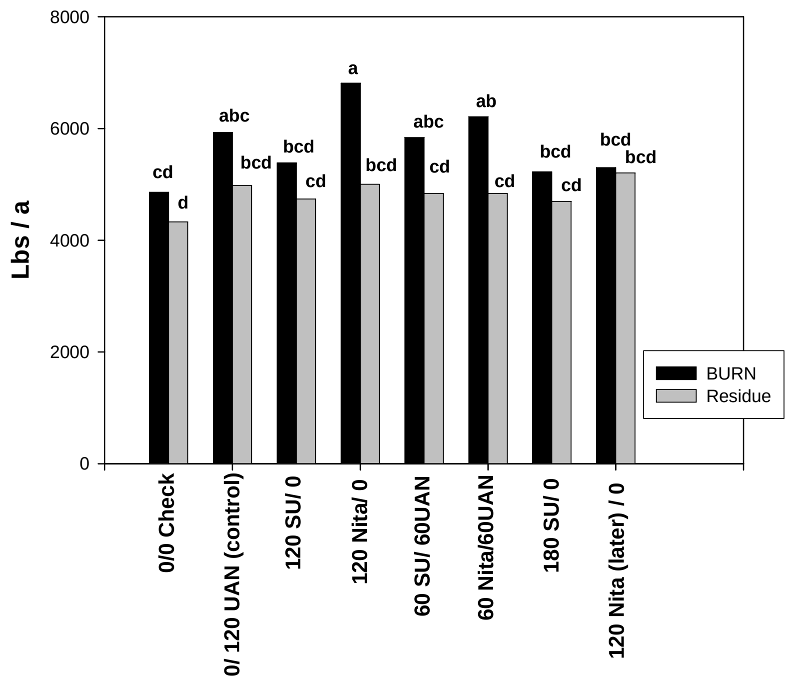


Fig.3. The effect of all or split Winter applied Stable N sources on sugar yield of ratoon LCP85-384 with or without a harvest residue mat. Nita=Nitamin; SU=super urea; Lbs N W/Sp applied.

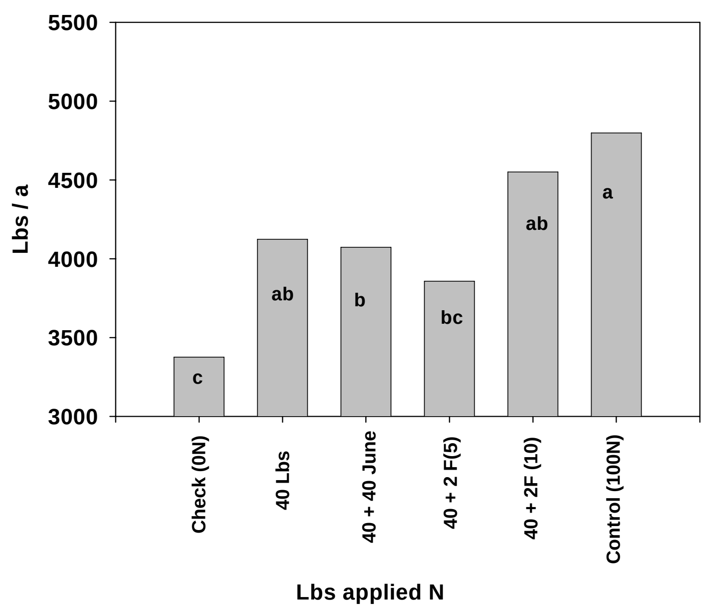


**Fig. 4. The effectiveness of supplemental fertilizer N treatments on sugar yield of low N cane. F=foliar CORON applications**

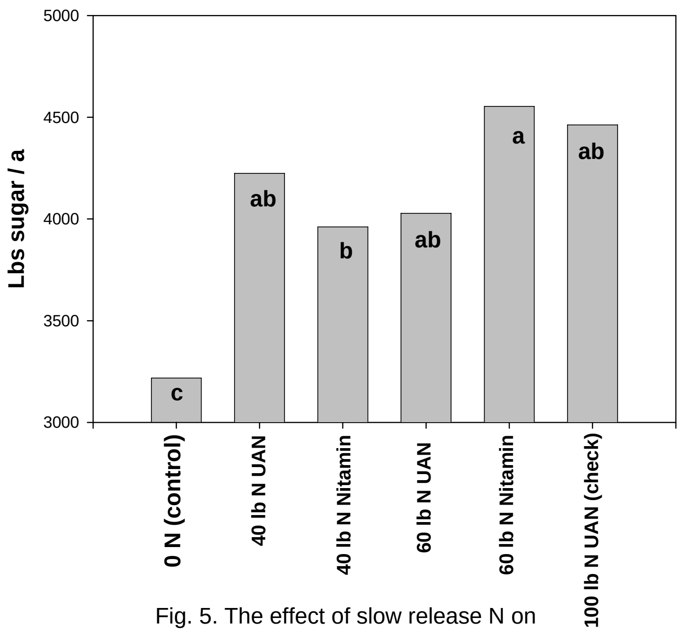


Fig. 5. The effect of slow release N on sugar production of 1st ratoon LCP85-384. Bars with the same letter are not statistically different.

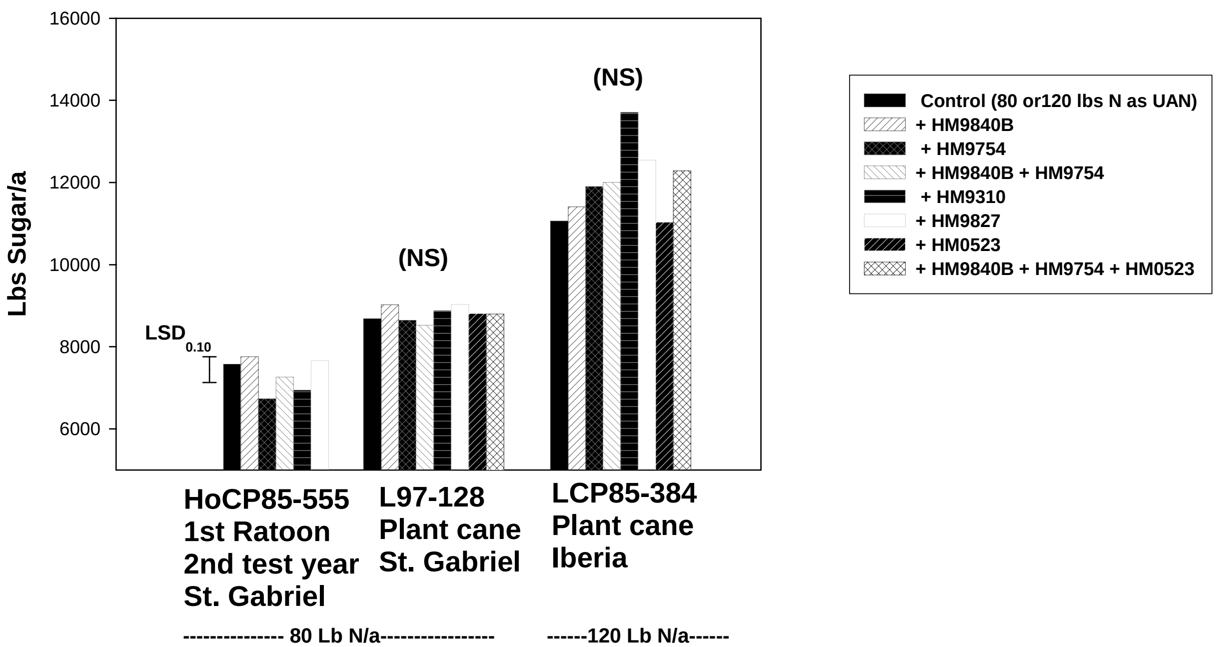


**Fig. 6. The effect of fertilizer additives and supplements on sugar yield of three varieties.**

## VARIABLE-RATE NITROGEN FERTILZATION OF SUGARCANE

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**Summary:**

Without an "in season" method of determining sugarcane nitrogen requirements, recommended rates have been based on average yield responses to various application rates utilized in numerous N-rate studies conducted over the decades. This approach fails to take into account seasonal changes resulting from mineralization, year-to-year variability and varietal differences in nitrogen use efficiency. Several crops are employing optical sensors to measure the Normalized Difference Vegetative Index (NDVI) between crops areas of sufficient N and that scheduled for N fertilization. Calculations are then made to determine appropriate application rates. There are other approaches, including applying N to management zones based on soil texture differences. This method has been evaluated for the last four years. Soil textural changes within fields were measured using soil electrical conductivity (EC), which in turn was used to articulate management zones for fertilizer application. Cooperative Extension's nitrogen fertilizer recommendations are predicated on soil textural differences, with lower N rates recommended for the sandier areas and higher rates for the areas of greater clay content. Soil N fertilizer prescriptions, therefore, were based on these recommendations.

The table below shows the association of EC and sugar per acre yield for the four fields that were studied. Nitrogen fertilizer was applied by EC zone, with each zone representing a range of EC measurements arbitrarily grouped from low to very high. Differences in EC mimic changes in soil texture within fields. Heavy-textured clay soil is typically more fertile than coarser-textured soil but high yields on the clayey (high EC) areas of the fields occurred in only one of the four studies. The sandier (low EC) areas of the fields produced the highest yields in most years. Often times the potential yield advantage of the clayey soils is not expressed because of poor soil moisture conditions. Another situation that adversely affected the tests is the inability of LCP 85-384 to yield under stress. The variety simply has not yielded to expectations, which was undoubtedly related in part to its failure to yield well on heavy-textured soil in the low-yielding environments of the last few years.

| Association Between EC and Sugar/acre Yield for Variable N Rates Studies | | | | | | | |
|---|---|---|---|---|---|---|---|
| Study no. 1 | | Study no. 2 | | Study no. 3 | | Study no. 4 | |
| EC | Sugar/a | EC | Sugar/a | EC | Sugar/a | EC | Sugar/a |
| Low | 6,366 lb | Low | 7,048 lb | Low | 7,248 lb | Low | 5,254 lb |
| Med. | 6,979 | Med. | 6,639 | Med. | 6,239 | Med. | 4,706 |
| High | 7,893 | High | 5,994 | High | 6,504 | High | 4,037 |
| | | | | Very high | 6,103 | Very High | 4,893 |

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