

CHANGES IN SOIL PROPERTIES FROM DAIRY MANURE AMENDMENTS USED FOR COTTON

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Abstract

Limited land area for manure reuse has led to repeat applications to row crops such as corn, cotton, and chile. Manures contain nutrients suitable for plant uptake but are often present in excess amounts. The objective of this project was to assess cotton response to dairy manure and assess soil fertility after application. There were 5 replications of 2 manure and synthetic nitrogen rates. Application rates were determined using soil test recommendations and estimating 35 percent nitrogen availability from manure. There was also a no nitrogen control. Dairy manure was applied from 1996 to 2002. One-third of the manure plots received manure every year while another third received manure every other year, and the final third of the plots received manure every third year. Cotton yield, quality, and nitrogen uptake were evaluated in 1996 and 1997.

Soils were sampled in July 2003 to assess changes in soil fertility. Lint yield was not affected by manure or synthetic nitrogen sources in 1996 or 1997. Manure applied to meet the nitrogen recommendation for cotton equaled the nitrogen applied to meet twice the nitrogen suggested from the soil test report. Manure applied every year or every other year increased inorganic-N, phosphorus and potassium levels to sufficiency levels over that of synthetic plots.

DTPA extractable zinc, which is typically deficient in high pH soils, was elevated over the zero nitrogen and synthetic plots to the point of sufficiency. Continuous manure applications appeared to take three years from initial application to start affected yield and plant growth. Long-term use of manures will reduce the need for synthetic fertilizer inputs.