

From the campus

Scientist's device measures nitrogen loss

Agricultural scientists in the past reported substantial volatilization losses of nitrogen from surface-applied urea. But 1976 studies conducted by Dr. David E. Kissel of Texas A&M University, utilizing a new collection device he designed, indicate some former test conclusions may be wrong.

Experiments carried out by Dr. Kissel in 1974 and 1975, using traditional methods, confirmed earlier nitrogen volatilization loss data. Dr. Kissel, however, was not satisfied that measuring techniques were appropriate for natural field conditions. In fact, he noted that the traditional measuring equipment actually created an artificially adverse environment that greatly induced nitrogen volatilization readings.

During the winter of 1975, Dr. Kissel, working closely with Texas A&M and U.S. Department of Agriculture engineers, developed an accurate new collection device that would not create conditions of artificial temperature, relative humidity and soil water content. He believed these conditions were responsible for limiting reliability of previous data.

Then in 1976, he conducted a series of experiments on coastal bermudagrass sod using his new measuring device, which did indeed confirm his opinion that some earlier volatilization data had been incorrect.

At application rates ranging from 50 to 400 pounds of actual nitrogen per acre, Dr. Kissel was unable to measure greater than a 3 per-

cent loss of nitrogen from any treatment, and that occurred only at the 50-pound per acre application level. Losses of only one, 0.5 and one percent respectively, were measured at the 100, 200 and 400 pound application rate levels. Calcium nitrate, dry urea, Uran nitrogen solution spray and uran applied in narrow bands on the soil surface were tested. Dr. Kissel said the average of test results for two seasons indicated nitrogen uptake by the crop was "close to the same for all N sources."

"Because this conflicted with the previous data," Dr. Kissel explained, "we then recreated the experiment in the laboratory using former equipment, and found that our volatilization losses ranged as high as 39 percent."

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