EFFICIENCY OF AMMONIATED SUPERPHOSPHATES FOR COTTON

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The process of using superphosphate as an absorbent for ammonia, although known for many years, was not practiced extensively in the fertilizer industry until about 1928. Its use began commercially when the production of synthetic nitrogen compounds made cheap ammonia available for fertilizers.

The simple process of ammoniation is of considerable economic importance for the several reasons enumerated by Jacob and Ross. One of the most important reasons given was that it afforded a way of using anhydrous ammonia, one of the cheapest forms of nitrogen available to the fertilizer industry. A serious problem of importance to all interested in the production and use of mixed fertilizers was the fact that the addition of ammonia to superphosphate resulted in the formation of less soluble phosphates. Keenan's work showed that superphosphate, carrying 89.4% of the phosphoric acid as monocalcium phosphate and 10.6% as di-calcium phosphate, on ammoniation to 2% ammonia contained 12.3% of the phosphoric acid as monocalcium phosphate, 36.4% as di-calcium phosphate, and 51.3% in the form of mono-ammonium phosphate. On increasing the ammonia content to 4%, the superphosphate was found to contain 14.7% di-calcium phosphate, 43.5% tri-calcium phosphate, and 41.8% mono-ammonium phosphate. Ammoniation to 6% ammonia changed the phosphate to 79% tri-calcium and 21% mono-ammonium phosphate.

In order to determine the influence of the less soluble, and supposedly less available phosphates, on the yield of cotton, a considerable number of field experiments were conducted. In these experiments, a study was made of the efficiency of superphosphate, ammoniated superphosphates carrying approximately 2 and 4% nitrogen, and precipitated tri-calcium phosphate. This paper reports averages of the results obtained in Alabama during 1931 to 1934, inclusive.

PROCEDURE

All of the experiments reported were conducted cooperatively with farmers. In this paper the term "experiment" refers to the studies made on one series of plats during a single year. The method of replication employed was to locate a

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