

Nitrates and Farming

For the most part, soil fertility was considered a Southern problem. In the West and North, there was still plenty of virgin and uncultivated land suitable for farming. The South, on the other hand, had been the center of agricultural production since colonization. Fertilizers were not needed or used in much of the South until after the Civil War. By then, the land had been leached of its nutrients, particularly from cash crops like cotton. In the latter half of the 19th century, fields were revived with the use of guano, which restored nitrogen among other essential nutrients. Low-producing cotton fields suddenly yielded three to five times as much per acre, resulting in an extended reign of King Cotton.

Nineteenth century efficiency and demand for cotton encouraged people to plant as much as possible. Cotton was always in demand and could be sold worldwide, unlike perishable crops which had to be sold in limited local urban centers. More and more land was cleared for crops planted from property edge to edge and as close to the house and outbuildings as possible. Despite fertilizing, the system was unsustainable. Nutrients were not being replaced as quickly as they were being pulled from the soil. At the time, soil nutrients were still not well understood, for instance the understanding of which crops took which nutrients and how much from the soil each year.

Soil science was in its infancy when commercial fertilizers came to the market at least by 1843 when a company in England manufactured and sold superphosphate, followed shortly thereafter by a plant in Baltimore. These “complete” fertilizers were comprised of nitrogen, phosphorus, and potash and minimally guaranteed to produce a better crop – if only in the short term. In the U.S. nitrate was imported from Chile starting in 1861 and potash from Germany in 1870. The basis of that original process continued to be the standard of phosphate production into the mid-20th century.

Unfortunately, by 1880, capitalistic profit and short term gain encouraged charlatan tactics when selling fertilizers to economically depressed and uneducated farmers. Fertilizer companies were duping farmers by

selling them dubious products mixed with fillers like sand and peanut hulls and additives like fish scraps to make it appear more “rich and fertile.” Farmers were essentially paying all they had for a portion of the real fertilizer they needed. The farmers’ problem was compounded by their reliance on the cash crops to pay for the fertilizers and supplies they used to produce their crops. While landowners may have been better off than sharecroppers or tenants who had to give part of their crop or cash to the landowner, some independent landowners still needed to rent implements and tools and pay for seed and fertilizer. Abuses of advertising and false claims by fertilizer companies brought about regulation by various state departments of agriculture.

(Below) Tennessee Valley Fertilizer Demonstration, 1937; Records of the Tennessee Valley Authority (TVA), Record Group 142; National Archives and Records Administration – Atlanta, Photograph No. 1462 K.



But soil nutrients and fertilization were not the only things to be conscious of when maintaining a healthy agricultural economy. Crops can be hard on the land- turning soil, planting, leaching, and harvesting can leave fallow fields vulnerable to erosion in the wet winter. This is a fact of farming and does not necessarily indicate that cotton and other intense crops are bad or should not be produced; rather it is the system of farming focused on a cash crop return with little regard for the soil

structure and the health of the land which is at fault. Slope, moisture, organic matter content, cropping practices – all need to be included in the study of soil restoration, one of TVA’s goals.

The enacting of the TVA was in part a response to the fertilizer industry’s pursuit of profit over the public interest. TVA and its soil restoration and fertilizer programs were intended to restore and stabilize farm soil for the long term. These programs were constructed around three basic pillars: research and development of new products and processes for manufacturing fertilizers, the enacting of test-demonstration activities made to illustrate the need, effect, and best practices of fertilizer as an economic return, and the distribution of TVA-manufactured fertilizers to the farmers directly.

Muscle Shoals became the center for research for the TVA’s fertilizer manufacture and programs. By 1933, Nitrate Plant No. 1 was obsolete and would take too much refurbishing and upgrading to suit the needs of the TVA and fertilizer production. This led to the importance of Nitrate Plant No. 2, one of two such plants in the county by the time it was operational. While the nitrate plant was efficient and cost effective, TVA fertilizer research was aimed at accumulation of information and understanding of the soil and its needs in the long term, not strictly profit.

As noted, fertilizer alone would not correct the farming conditions of the South. Better farming practices, such as crop rotation, particularly with nitrogen-fixing legumes such as soybeans, would ensure that soils would not be depleted or lose their structure. To promote better practices, TVA instituted what they called “Test-Demonstration” farms which would “provide an important educational device in demonstrating to other farmers the opportunities in making sound adjustments on their own farms. A major objective of the test-demonstrations is adoption by all farmers in a community of better farming systems which will improve soil fertility through a continuous process of experimentation, education, and introduction on practical farms of more efficient farming methods and techniques.”