

Murphy-Brown LLC

PO Drawer 856
2822 Hwy. 24 West
Warsaw, NC 28398
Tel: 910-293-3434
Fax: 910-293-6957

July 20, 2010

To Whom It May Concern:

This letter is intended to discuss Murphy-Brown LLC's experiences with the phosphorous binding product produced by NAG. Murphy-Brown LLC, a subsidiary of Smithfield Foods, Inc., is the largest swine producer in the world, producing more than 15 million market swine annually on farms in 11 US states. An obvious product of swine production is manure that is managed under various state and federal water quality permits. The vast majority of our farms utilize anaerobic lagoon technology as a primary treatment component of our waste management systems. The treated effluent from these systems is typically land applied to owned and/or leased farm land surrounding the farms. In this process, it is required that nutrients applied (N,P, and K) are in balance with the needs of the crops being grown, and are not lost to the environment. Our effluent generally contains N and P in an approximate ratio of 3:1. Most crops need these nutrients in a ratio of 4:1 or greater. Due to this imbalance, P has to be managed to prevent overapplication and possible loss.

Prior to dealing with NAG, our most cost effective option for managing Phosphate was either purchasing or leasing more land to apply our manure nutrients. While solids separation, struvite production, etc., were options, they were more expensive than adding additional land. During our initial testing of the NAG product, our main concern was cost. Our first test was on a 10,000,000 gallon secondary lagoon on a farm that was operating under a phosphorous based plan. The phosphate concentration at the beginning of the trial varied up to 100 ppm. Our targeted concentration for the desired N:P ratio was 50 ppm. For the initial test, 20 tons of product was applied to the lagoon. Within a day, Phosphate levels were lower than the target levels. This low concentration held for greater than 6 months even with the continued addition of manure from the primary lagoon cell. An additional application of the product was made approximately 6 months after the initial application to maintain the desired phosphate levels. This application required only 5 tons and was effective for an additional 6 months.

Since this initial test, we have put 6 additional secondary lagoons on the NAG program with similar results. We continue to be very pleased with the quick action and longevity of the treatments. This program has allowed these farms to convert back to Nitrogen based plans from Phosphorous based plans with no new land addition. I would feel comfortable, based on our results, to treat any primary or secondary lagoon in our system if phosphorous reductions were necessary for sustainable and compliant operation.

We have been very pleased with the NAG product and service. If additional information or discussion is desired, please feel free to email me at kraigwesterbeek@murphybrownllc.com.

Sincerely,

Kraig Westerbeek
Asst. Vice President
EHS Compliance