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RE: Land Application of Discarded Milk, April 5, 2020

Written by Steph Kulesza

With current issues in milk markets due to Covid-19, many dairy producers may be forced to dump their milk. Should a producer not feed the discarded milk, direct land application as a fertilizer or diversion of the milk into the waste management system requires planning to ensure appropriate application rates, proper sampling, and necessary setbacks to maintain compliance within the facility's Certified Animal Waste Management Plan (CAWMP). Because Milk is much higher in nitrogen than manure, it is important to understand the impact of land applying milk as a fertilizer within your CAWMP and find alternative land application sites should nutrient budgets require it.

Milk contains around 45 lbs of nitrogen, 18 lbs of phosphorus (P2O5), and 15 lbs of potassium (K2O) per 1000 gallons. Considering dairy manure slurry has an average of 16.7 lbs N, 9.1 lbs P2O5, and 15.4 lbs K2O per 1000 gallons, the land application of milk will require much lower application rates as compared to manure and could require additional land application sites for agronomic management of this material. Also, the addition of milk to the waste storage system could alter the nutrient concentrations of resulting slurry.

To determine appropriate application rates of discarded milk, identify the Realistic Yield Expectation for the receiving land application site. This requires the following information: soil type, crop rotation, and county. Use the Realistic Yield Expectation Tool found at https://realisticyields.ces.ncsu.edu/, to determine the allowable nitrogen rate for the receiving crop. The allowable nitrogen application rate is listed within your CAWMP if the land application site is already within the plan. Then, divide the nitrogen rate (lbs N/ac) by the nitrogen content of milk (45 lbs N/1000-gal) or manure-milk mixture. This will give you the allowable application rate in 1000-gallons per acre. On average, a dairy cow produces 100 lbs of milk per day, which equates to 11.6 gallons per cow per day to be discarded. For a 100-cow dairy, this would equate to 52 lbs of N per day that would be land applied or added to the lagoon. While this may not seem like much, dairies with tight nutrient budgets for current land application sites may need to consider alternative locations or storage within the lagoon until an alternative site can be located.

To maintain compliance with your CAWMP, make sure you send in a sample of the milk for a waste analysis if it is to be land applied. If added to the lagoon, the lagoon should be sampled prior to land application. This should be labeled as a diagnostic sample if sent to the NCDA&CS Plant, Waste, Solutions, and Media Analysis Lab to ensure analysis during this time. Also, make sure to adhere to all setbacks as required by the North Carolina Cattle General Permit. Discarded milk must also be applied within the application windows of the receiving crop and within 30 days of planting/breaking dormancy or to an actively growing crop. If no such sites are available, storage in the lagoon may be required. Land application of milk could generate nuisance odor after land application. Therefore, careful consideration should be paid in identifying the best location for land application.

Should you have any questions, please contact your local Cooperative Extension Agent, Stephanie Kulesza (Nutrient Management and Animal Waste Specialist) with NC State, or Christine Lawson with the Department of Environmental Quality.

Cooperative Extension
https://www.ces.ncsu.edu/local-county-center/

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