

Economic and ecologic assessment of groundwater nitrogen pollution from north Florida dairy farm systems: an interdisciplinary approach.

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The presence of nitrogen (N) in water is an environmental hazard because it affects human health and ecosystem welfare. The Suwannee River Basin in Florida has received much attention in recent years due to increased N levels in water bodies. Dairy waste is thought to be an important factor contributing to this water N pollution. Evidence indicates that farms may reduce their total N loads by changing some management strategies. Using published and stakeholders' information, a dynamic, empirical, stochastic, interactive, and user-friendly model was created to simulate north Florida dairy farms and use it to test management strategies that may reduce nitrogen pollution and still maintain farm profitability. Testing different crop rotations, crude protein contents, time spent on concrete by milking cows, and time of liquid manure in the storage pond, it was found that intensive crop rotations have the greatest impact on reducing N loss and at the same time improve profitability. It was also found that reducing crude protein may reduce N release and increase profitability. Reduction in time spent on concrete reduces the amount of manure N handled by the system and consequently may reduce the amount of N lost to the environment. Increasing the time liquid manure spends in the storage pond may reduce the risk of N lost to groundwater but increases the amount of N lost to the air, which is not used by the crops and consequently decreasing profitability. A combination of decreasing crude protein content in the rations and efficient crop rotations may considerably increase profitability and decrease N loss to the minimum.

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