

Well-managed grazing helps protect ground water quality



Rotational grazing is becoming more popular in the USA. Grazing can reduce operating expenses and improve animal health, profitability, and quality of life for dairy farm families, compared to confined management systems.

Problem:



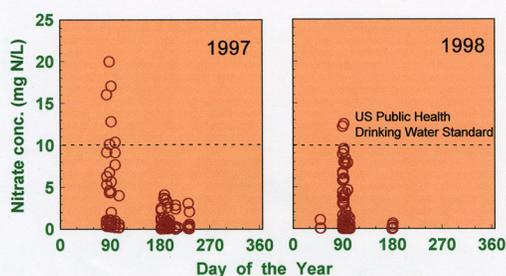
Cows urinate and defecate about 12 times per day. **Urine spots contain 500 to 1000 lb/acre of available N** and are applied at about **100 inches per hour!** This can cause large N losses in humid climates. Is this a problem in the Upper Midwest?

Approach:

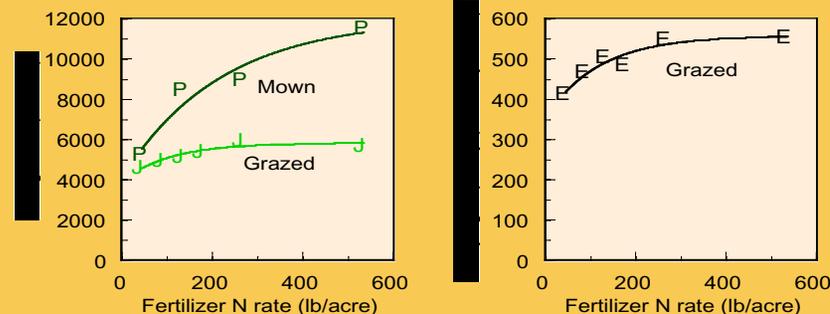


We inserted large drainage lysimeters into pastures in three experiments in Wisconsin and Minnesota to measure, for the first time in the Upper Midwest, what nitrate leaching losses are occurring. Each paddock had up to 13 of these one-foot diameter lysimeters.

Findings:

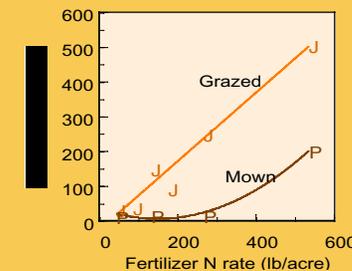


Even when leaching occurred under grazed pastures, the nitrate concentration was almost always below the US Public Health Drinking Water Standard.



Forage yield increased with N fertilizer under both grazing (circles) and mowing (triangles). The carrying capacity of pasture (cow-days) were highest with 250 to 300 lb N/acre annually.

More nitrate N remained in the soil in autumn under grazed pastures than under mowed grass. Although we found that leaching was small at (less than 10 lb N /acre) all fertilizer rates, the risk of leaching under grazing increases with higher N rates.



Current research is focused on determining whether grazing promotes another means of protecting ground water quality denitrification of nitrate to gases.

Bottom line: Midwestern dairy farmers who graze their livestock and apply low to moderate amounts of fertilizer N help protect ground water quality.

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