Science Societies

Grazing Reduces Nitrate Leaching in North Florida Crop Systems

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Left: The researchers installed a drain lysimeter at each plot at the beginning of the study. Right: Both cool-season (top) and warm-season (bottom) treatments consisted of different grazing intensities. Photos by Erick Santos.

In Florida, major field crops include cotton, peanuts, corn, and sweet corn, which are all summer crops. After these cash crops are harvested, the land is often left fallow, leaving it prone to soil erosion and nutrient leaching. One place this scenario plays out is the Jackson Blue Spring and Merritt's Mill Pond basin in the Florida Panhandle where more than half of the nitrates come from agriculture. This can result in severe and prolonged environmental damage.

With the goal of mitigating nitrate leaching and increasing land use efficiency, researchers at the University of Florida studied crop–livestock system options. They investigated nine systems featuring different combinations of cover crops, cropping rotations, grazing intensity, and nitrogen fertilization. After installing drain lysimeters in each experimental plot, they analyzed the leachate for nitrate and ammonium.

Cover crops were associated with lower leachate nitrate concentrations and cumulative nitrogen (N) leaching compared with fallow. Systems containing a warm season perennial grass further enhanced this benefit. Cumulative N leaching was lower in systems with grazing animals than in systems without, but surprisingly, grazing intensity had no measurable impact. These findings suggest winter grazing benefits producers without water quality impairment.

Adapted from Santos, E. R. S., Dubeux, J. C. B., Mackowiak, C., Wright, D., & Anguelov, G. (2023). Integrated crop–livestock systems result in less nitrate leaching than ungrazed crop systems in North Florida. *Journal of Environmental Quality*, *52*, 847–858. https://doi.org/10.1002/jeq2.20474

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