Poster

Major   Agriculture Science

Faculty Mentor: Mark Bernards

Observations from the First Year of a Multi-Year Cropping System Study That Integrates Livestock Grazing

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Winter cover crops and perennial cropping systems have been shown to reduce nutrient loss in tile drainage. Adoption of cover crops is limited due to management challenges of establishment, termination, and perceived additional expenses. One possible way to increase the economic value of cover crops is to integrate livestock grazing. Our objectives are to 1) quantify crop and cover crop productivity and soil health parameters for three distinct cropping systems, and 2) measure the influence of high-intensity, short-duration grazing of cover crops in a corn-soybean or a perennial grain cropping system on nutrient loss through subsurface drainage tiles. Three cropping systems are being evaluated: 1) corn and soybean (control, applying standard management practices for western Illinois), 2) continuous cover (corn, winter cover crop, soybean, winter annual grain, summer cover crop), and 3) perennial cover (planted to intermediate wheatgrass, Kernza®). Water flow metrics and water quality samples were taken every two weeks during the growing season and analyzed for N and P levels. Plant height and biomass were collected before and after grazing to determine forage utilization. Nitrate concentrations in drainage tile water were reduced in plots where a cereal rye cover crop was growing. Cattle consumed approximately 30% of the rye dry matter in the high intensity grazing. Early season moisture and June warmth provided excellent conditions for lodging and fusarium head blight in rye, triticale, and Kernza, depressing yields. Heat and drought in July-September, coupled with deer and raccoon feeding, negatively affected corn and soybean yields, especially in corn and soybean planted into wet, compacted soils following cattle grazing of the rye cover crop.