

# Surface Runoff Nutrient Losses from Claypan Soil Receiving Fertilizer and Turkey Litter

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## Introduction

Loss of nutrients and sediment in runoff are significant threats to surface water quality. Little information is available on relative losses of nutrients from animal wastes as compared to commercial fertilizers, especially in southeastern Kansas. Percolation is restricted through the subsurface horizon of the claypan soils of the area and distribution of the more than 100 cm of annual precipitation is poor. With no aquifers in southeastern Kansas, water quality concerns from agriculture focus primarily on losses in runoff of surface water.



Upslope view of water quality plot at Greenbush



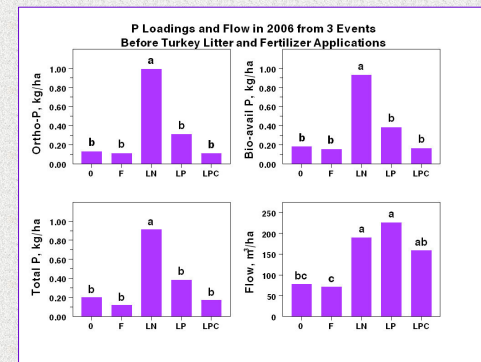
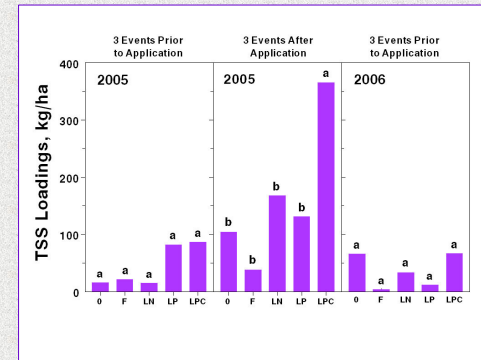
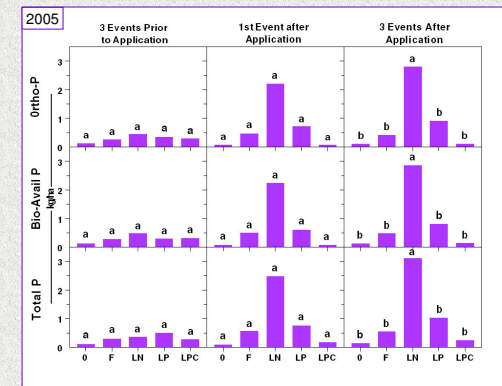
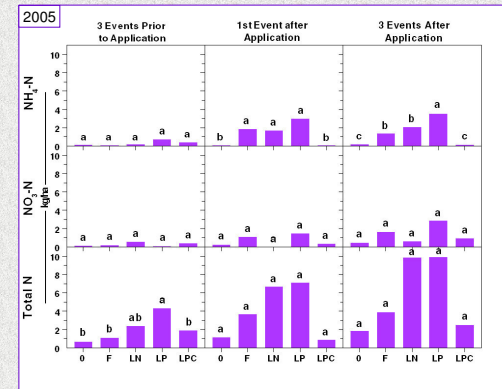
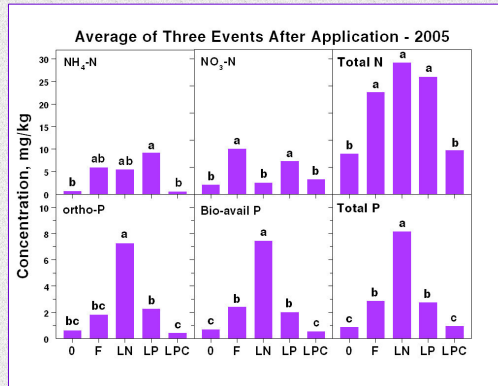
## Objectives

- To compare surface runoff losses of nutrients and sediment from fertilizer and turkey litter manure nutrient sources
- To determine the influence of tillage on nutrient and sediment losses in surface runoff

## Treatments

- O** (Control) – No N or P from fertilizer or turkey litter
- F** (Fertilizer) – Only commercial fertilizer to supply N and P with no turkey litter
- LN** (Turkey Litter: N based) – Turkey litter applications to supply all N needs of the crop [~ 4 Mg Litter/ha – that also provides excess P]
- LP** (Turkey Litter: P based) – Turkey litter applications to supply all P with supplemental fertilizer N [~ 0.5 Mg Litter/ha]
- LPC** (Turkey Litter: P based) – Same as “LP” treatment but with incorporation of litter and fertilizer by conventional tillage

Individual plot size = 0.4 ha – Two replications  
Grain sorghum in 2005-2007  
Location: Greenbush Educational Facility, Girard, KS



## Preliminary Findings

- Overall, this field study demonstrates the greater P losses that can occur if a producer applies turkey litter based on crop N needs.
- Applying turkey litter based on crop P needs reduces P losses, especially if incorporated.
- Nitrogen losses appear to be a bit more variable than P losses.
- Incorporation by conventional tillage may result in greater sediment loss, but these losses are small from this typical claypan soil.