

Kansas Agricultural Watershed Field Laboratory

About the Project

The Kansas Agricultural Watershed (KAW) field laboratory was established in 2014 to study the effects of agricultural management practices on water, sediment, nutrient, and chemical losses. The KAW field lab consists of 18 small watersheds ranging from 1.2 to 1.6 ac in size (study map on reverse side). Each watershed is instrumented with a 1.5 ft H-flume and automated equipment to measure runoff from natural rainfall and collect samples for water quality analysis. The site is also equipped with four automated rain gauges. The predominant soil type on the site is Smolan silty clay loam with an average slope of 6 to 8%.

Goal

The goal of the KAW field lab is to develop sustainable conservation practices that protect water quality and maximize yield and profitability while simultaneously providing producers with flexible nutrient management and cropping system options.

Current Research

The KAW field lab is currently being used to study the effects of cover crops and phosphorus (P) fertilizer management on water quality and crop growth in corn-soybean rotations. Six management systems were implemented during fall 2014, including fall broadcast P fertilizer, spring injected P fertilizer, and a no P fertilizer control. Each fertilizer treatment will be studied with and without the use of a cover crop. Runoff from natural rainfall from all plots will be measured, including sediment and nutrient losses. This project will increase our understanding of the impact of cover crops and fertilizer management on crop yield, water quality, and farm income.

Salient Issues

Phosphorus inputs to surface waters promote algae growth, which can decrease dissolved oxygen, trigger fish kills, and increase drinking water treatment costs. Therefore, it is important that we develop agricultural best management practices (BMP) that minimize P loss to surface water.

Current Study Objectives

The overall objective of the current research project is to determine how interactions between cover crops and P fertilizer management impact P loss and efficiency, crop yield, and net return. Specific research questions that we will answer include the following:

- How does P loss from fall surface-applied P fertilizer compare to P loss from spring injected P fertilizer, the currently recommended BMP?
- Will cover crops reduce P losses and does this depend on the method and timing of P fertilizer application?
- What are the agronomic, environmental, and economic effects of winter cover crops in corn-soybean rotations?



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