FINAL REPORT

2001

GRASS HEDGES FOR CONTROL OF RUNOFF AND EROSION

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Introduction

Severe erosion often occurs in the Midwestern United States on sloping farmland cropped to corn and soybeans using conventional management practices. This erosion is traditionally controlled by contour farming, conservation tillage, conservation cropping sequences, and terraces. These practices have not always been accepted for various reasons. Construction of terraces is expensive and removes land from production where slopes are steep. Conservation tillage often requires special equipment and skills to be successful. Contour farming is difficult on irregular slopes.

Narrow grass hedges that are planted or seeded across slopes on a general contour, may be a more feasible option for reducing runoff flow and soil losses from irregularly sloped row cropland.

Standard erosion plots established in the early 1940's on a claypan soil near Kingdom City, Missouri were used to determine the ability of grass hedges to control runoff and soil losses from conventionally tilled soybeans. Data obtained from this study will be helpful in planning the best management practices for the conservation of soil and water under soybean cropping.

Study Objectives

A. Determine the ability of grass hedges to reduce runoff and soil losses from conventionally tilled soybean planted in 30 inch rows.

B. Evaluate plant survival associated with submergence by sediment deposition.

C. Evaluate growth characteristics of hedge grasses including rate of growth and ability of grass to coalesce into solid hedges.

D. Determine hedge effects on yields of soybeans.

Study Results

Grass hedges were established at the standard erosion plots at the McCredie Farm at Kingdom City, Missouri on April 29, 1992. 'Cave-In-Rock' switchgrass, *Panicum virgatum*; 'Pete' eastern gamagrass, *Tripsacum dactyloides*, and Chinese silvergrass, *Miscanthus sinensis*, were planted across the end of each plot. Each grass was hand planted with container stock grown from the PMC greenhouse and placed in either a single or double row and replicated twice. Two replications of a control plot without a grass hedge were also included. At the end of the 1993 evaluations it became apparent that the Chinese silvergrass was too aggressive for the purpose of this study. It was then decided to remove this species and replace it with Texas bluegrass, *Poa arachnifera* Torr.

Both the 'Cave-In-Rock switchgrass and the 'Pete' eastern gamagrass performed good to excellent regarding deposition, weed and insect competition, growth rate and ability to hedge. The Texas bluegrass performed poorly.

Summary:

Hedge Effect on Yields:

- 1992: 8% Yield Reduction
- 1993: 28% Yield Reduction
- 1994: 25% Yield Reduction

Soil Loss:

- 1993: Soil loss reduced by 61% average (5.7 t/a vs 2.2 t/a)
- 1994: Soil loss reduced by 69% average (0.62 t/a vs 0.19 t/a)

Runoff:

- 1993: Runoff not significantly reduced
- 1994: Runoff not significantly reduced

Conclusions:

- Grass hedges can reduce soil loss by trapping sediment
- Grass hedges may not reduce total runoff amounts
- Grass hedges may reduce yields in adjacent crop rows

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