

**Kawkawlin River Watershed
Buffer Strip Study**

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DNRE | Department of
NATURAL RESOURCES
and ENVIRONMENT

Spicer
group
ENGINEERS • SURVEYORS • PLANNERS

Scope and Outline

- Address Sedimentation Concerns
- Treat with Vegetative Filter Strips (VFS)
 - Research
 - Model Development
 - Implementation
- Quantify Impact of Sediment
 - Drain Cleanouts
 - Financial Costs

Vegetative Filter Strips



- Dense Vegetation Near Edge of Erodible Land
 - Agricultural Lands
 - Slows Runoff
 - Deposits on Shoreline
- Various Types of Strips
 - Plants
 - Width



Effectiveness of VFS



- Filter Effectiveness Depends on:
 - Soil Type
 - Slope
 - Contributing Area
 - Erodibility of Upland Areas
 - Type/Density of Vegetation
 - Local Climate

Suggested Buffer Width

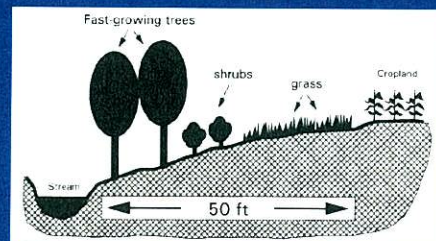


- USDA CREP
 - 50-100 feet
- NRCS Conservation Practice Standard
 - 20-30 feet
- Iowa State University
 - 50 feet for slope < 5%
- Ohio DNR
 - 50 feet minimum, 65-100 feet suggested
- USDA 1997 Agroforestry Notes
 - 50 feet

Composition of VFS



- Ohio DNR & USDA 1997
 - 50 feet
 - Trees Near Stream
 - Shrubs Middle
 - Grasses Near Field



A general, multi-purpose, riparian buffer design for cropland. – *USDA Agroforestry Notes (1997)*

Modeling Buffer Strips



- USDA Methods to Quantify Soil Loss
 - Universal Soil Loss Equation (USLE)
 - Revised USLE (RUSLE)
 - Incorporated into Computer Program
- RUSLE 2
 - Version 2 of RUSLE Computer Program
 - Used in NRCS Conservation Practice Standard

RUSLE 2

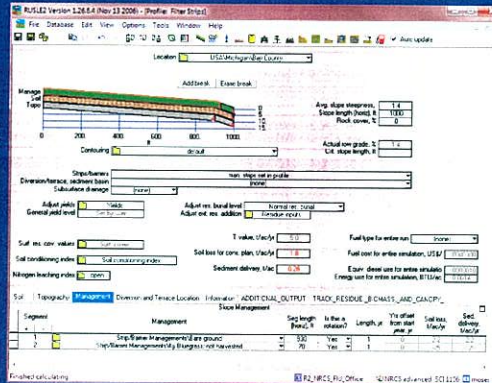


- Location Specific
 - Climate Data, Soil Data, Agricultural Practices
- Site Layout
 - Soil Types
 - Land Use
 - Filter Widths
 - Slopes
- 100's of Crops
- Sheet Flow

RUSLE 2 Continued...



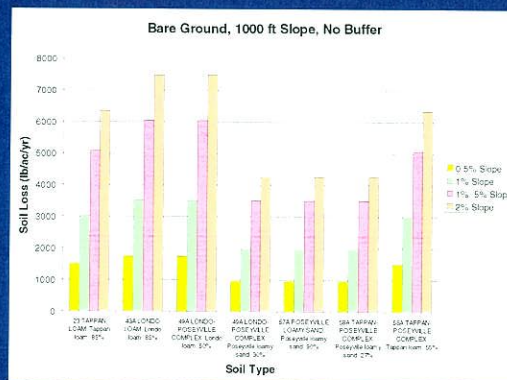
- Calculates Soil Loss from Field
 - Compare to Soil Loss Entering Receiving Water
 - Determine VFS Effectiveness
- Over 600 Different Scenarios Modeled



RUSLE 2 Results



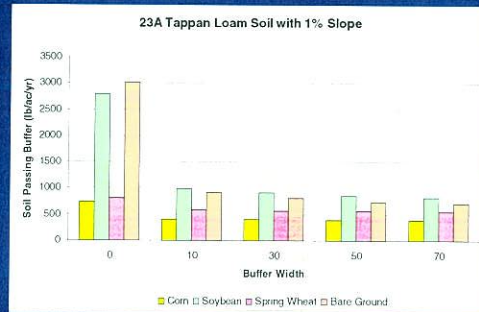
- Set Baseline without VFS
- Varying Soil Types and Slopes
 - Based on Soil Map
 - 7 Common Soils
 - 3 Different Soils



Upland Crops



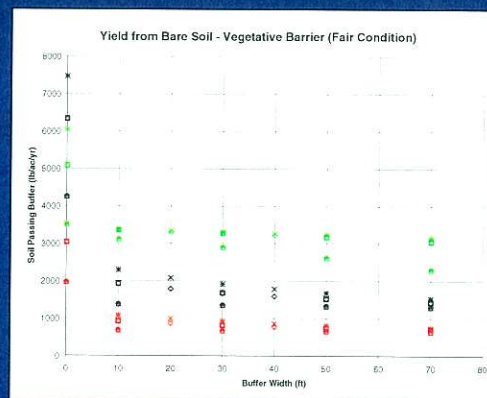
- Switchgrass VFS
- Comparison of 4 Covers
 - 100's of Practices in RUSLE 2
 - Varies Significantly
- Applicability
 - Rotations
 - Need Standard



Effects of VFS



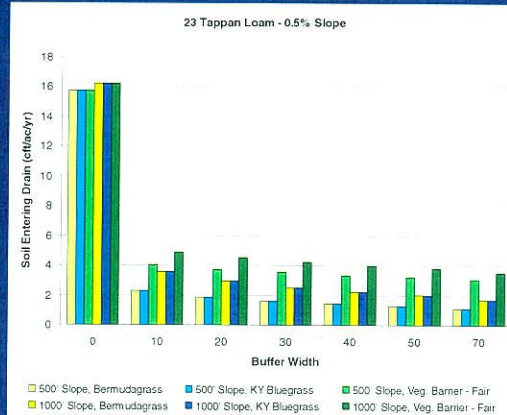
- Switchgrass Stands
- Varying Widths
- Varying Soils
 - Different Symbols
- Varying Slopes
 - 1%
 - 2%
 - 1% 900', 5% 100'
- Effectiveness



Sediment Trapped



- Use Bare Soil
 - Most Significant
- Varying VFS Types
- Small VFS Works
 - Limit VFS Life
- Somewhat Affected by Slope Length



Use of Findings



- Generalize Findings
 - Standardize Width of VFS
 - Estimate Reduction in Sediment
 - Acreage
 - Length of Drain
- Determine Rate of Accumulation in Drain
 - Time Between Drain Cleanouts
 - Cost Savings