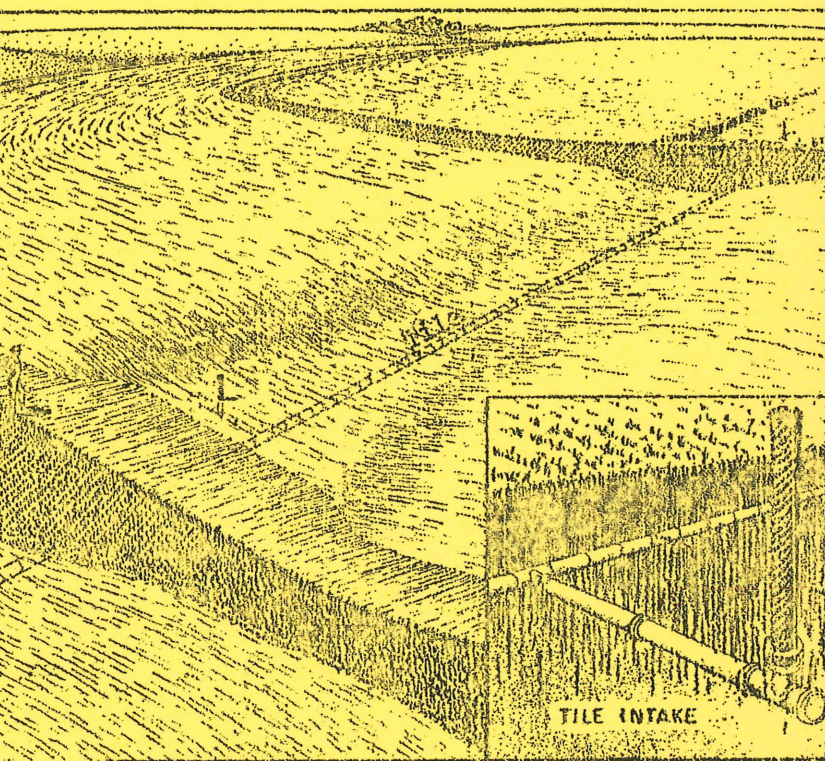


SOIL ASSOCIATION AREA



GUTHRIE SOIL
CONSERVATION
DISTRICT
1976

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This report vividly shows the goal for providing a wind and water management and erosion control program; It is the application and utilization of conservation tillage and tile outlet terraces.

GUTHRIE COUNTY
INVENTORY AND EVALUATION
OF
TERRACE NEEDS
IN
CLARION-WEBSTER SOIL ASSOCIATION AREA

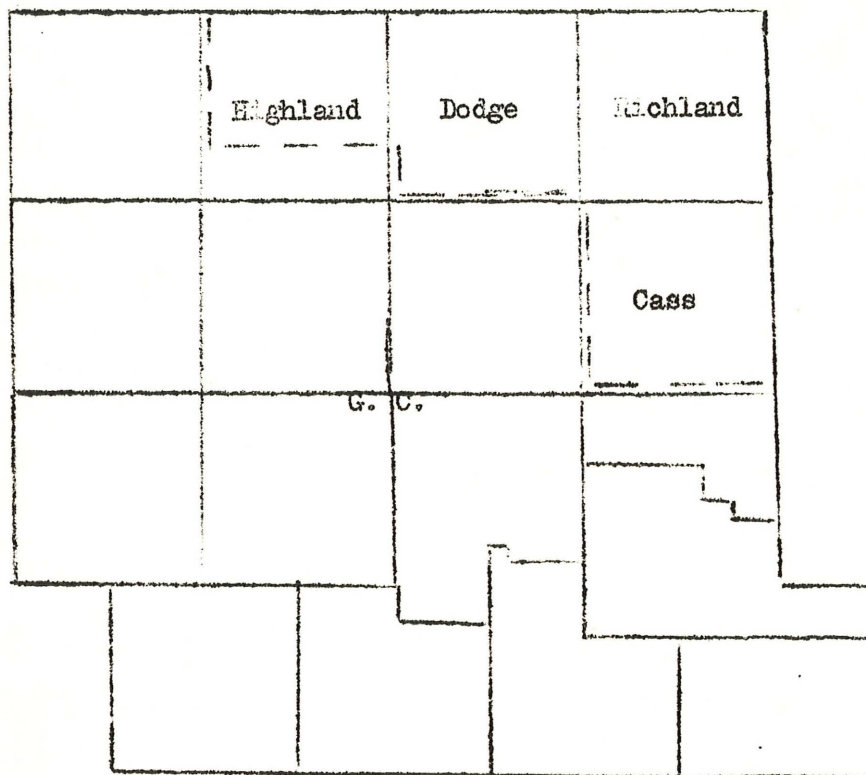


TABLE OF CONTENTS

Introduction	I
Statistical Sampling Data and Chart	III
Explanation of Chart on Page V	IV
Average Annual Soil Loss Per Acre Per Year Chart -	V
Graphic Chart	
Capability Class Analysis	VI
Summary-	VII

INTRODUCTION

This Inventory and Evaluation of terrace needs in the Clarion-Webster soil association area was accepted by the Guthrie Soil Conservation District Commissioners at a meeting held on August 10, 1976.

The Clarion-Webster soil association area of Guthrie County is, more or less, the northeast quarter of the county. It specifically is located in Richland, Dodge, North Cass, and 24 sections of Highland townships. (North four tiers in Highland)

During the last five years, approximately seventy percent (70%) of the terraces constructed in the Guthrie District have been in the Clarion-Webster soil area. For this reason, the commissioners felt an evaluation of terrace needs and a ratio of soil losses in relationship to different methods of farming operations should be made.

The soil losses shown in the tables were figured from the Universal Soil Loss Charts, using an average slope and length of slope.

The objective of this report is (1) show that soil erosion does and is occurring on our relatively level to moderately sloping Clarion-Webster soils, (2) show that erosion can be controlled with proper management and with the adoption of conservation treatments.

Field experience has shown that terracing in this area many times can not be accomplished by an individual landowner, but must be the accomplishment of two or more land owners. Watershed topography and the need of adequate tile systems mandates this group approach of solving an erosion problem common to the group.

The soil loss tables in this report clearly show that erosion can be controlled and that, by observation, each landowner hopefully can visualize the amount of soil being lost. Presently, Iowa is losing an average of two bushels of soil for every one bushel of corn produced on unprotected sloping land.

The Guthrie Soil Commissioners feel it is their duty to alert you of the erosion in this Clarion-Webster section of the district. They feel, with to-days land prices and the high production potentials, you will be more concerned

about your farm and your erosion hazards after studying this evaluation.

This report is our challenge for you to be better stewards of the land so that the future generations may also eat.

Guthrie County Soil Commissioners

Floyd Wilson, Chairman

Ralph Neal

Roger Chalfant

Dennis Patterson

Ralph Stringer

1976

STATISTICAL SAMPLING DATA

In the Clarion-Webster area of Guthrie County, eight 160 acre samples were evaluated in Richland, Dodge and Cass, and five samples in Highland. (South Cass, located south of Highway 44, is not included in this study.)

These twenty-nine 160 acre tracts, totaling 4640 acres, represent 5.5 percent of the total land acres, which is 84481 acres.

The figures derived from the statistical samples were converted to percentages. These percentages were used to project the average number of acres according to steepness of slope and land capability classes.

STATISTICAL SAMPLING DATA CHART

Capability Class	I	II	III	IV	VI
Slope Steepness	0-2.	2-5	5-9	9-14	14+
Township	*P.C. - Acres	P.C. - Acres	P.C. - Acres	P.C. - Acres	P.C. - Acres
Cass	7 1613	75 17280	16 3686	2 461	0 0
DODGE	15 3456	60 13824	22 5069	3 691	0 0
RICHLAND	33 7603	63 14515	4 922	0 0	0 0
HIGHLAND	10 1536	53 8141	31 4762	3 461	3 461
TOTALS	14208	53760	14439	1613	461

* P.C. - Statistical percentage figure X 23,040 acres per township, except 15,360 used for Highland Township.

The following table shows the average annual soil loss per acre per year for each township. These figures were derived from the Universal Soil Loss Chart, using a soil erodibility factor of K-0.32, a slope length of 300 feet and the other factors as listed.

Example: In Cass Township, Class II (2-5%), there are 17,280 acres. If you are using a corn-soybean-corn rotation, fall plowing, and farming straight, you are losing an average of 13.5 tons of soil per acre each year. This means Cass Township is losing $13.5 \times 17,280$, or 233,280 tons of soil per year, with this set of factors.

To find the average annual soil loss from your farm, use either the soil capability map in your own conservation plan or the Guthrie County Soil Survey Report to find your slope steepness. It will either be a letter, such as A, B, C, or D in the report, or in your conservation plan it will be the middle number of a set of numbers - example: 138-3-1 means 3 percent slope steepness. This will be in the 2 to 5 percent section of the tables.

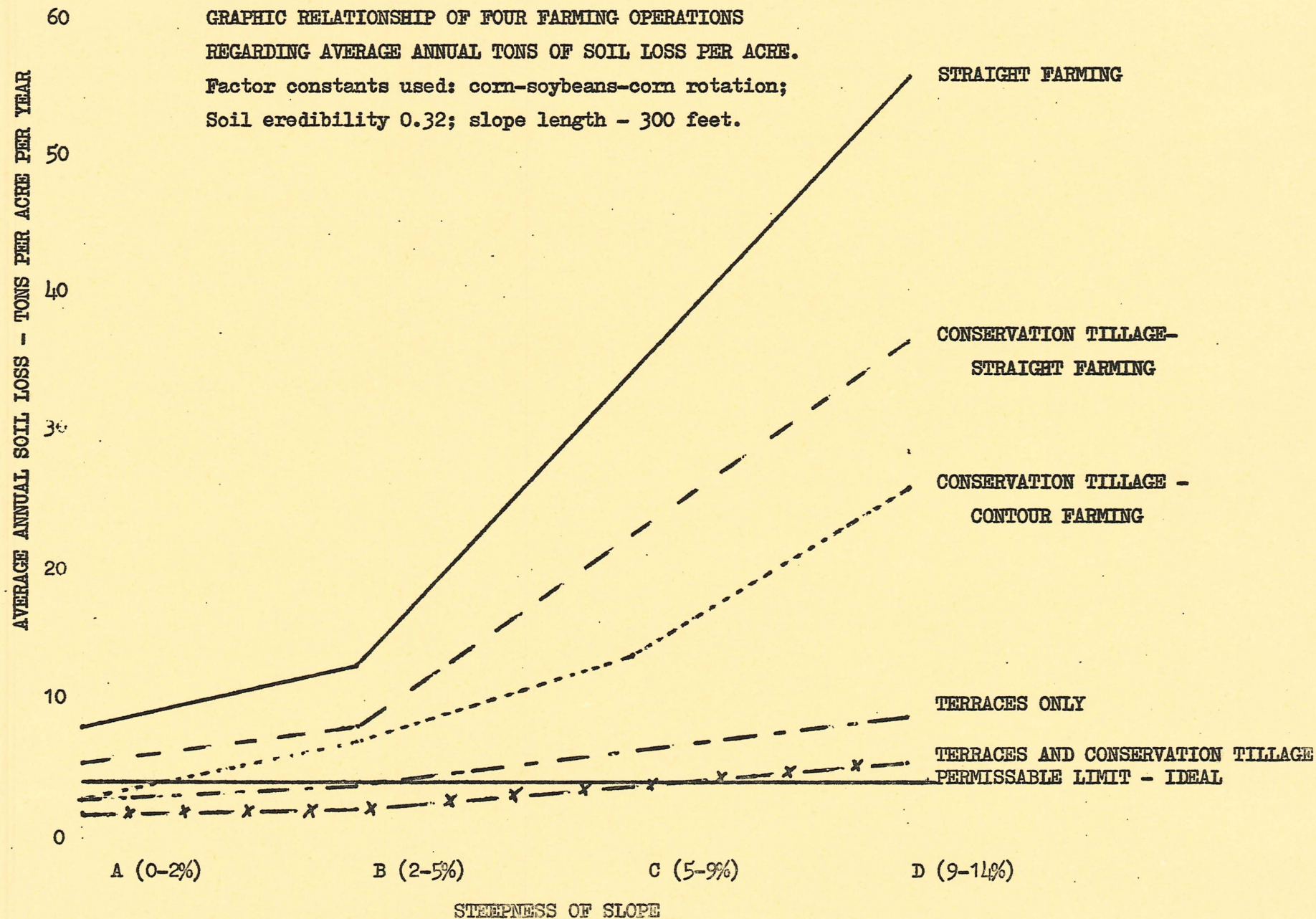
Select your farming method from the ones listed, and using the soil loss factor times the number of acres, you will get an estimated tons of soil you are losing each year from your farm.

AVERAGE ANNUAL SOIL LOSS PER ACRE PER YEAR

V

TOWNSHIP		CASS	DODGE	HIGHLAND	RICELAND
CLASS II (2-5%)	<u>FARMING METHODS</u>	17,280 acres X	13,824 acres X	8,140 acres X	14,515 acres X
(1)	Fall Plow-Straight Farming-Intensive Rowcrops	*13.5=233,280	13.5=186,624	13.5=110,704	13.5=195,952
(2)	Spring Plow-Straight Farming-Intensive Rowcrops	11.9=205,632	11.9=164,505	11.9=96,866	11.9=172,728
(3)	Conservation Tillage-66% Coverage-Corn/Soybeans	8.9=153,792	8.9=123,033	8.9=72,446	8.9=129,183
(4)	Parallel Terraces	4.6=79,488	4.6=63,590	4.6=37,440	4.6=66,769
(5)	Parallel Terraces/Conservation Tillage	3.0=51,840	3.0=41,472	3.0=24,420	3.0=43,545
CLASS III (5-9%)		3,686 acres X	5,068 acres X	4,761 acres X	922 acres X
(1)	Fall Plow-Straight Farming-Intensive Rowcrops	34.0=125,324	34.0=172,312	34.0=161,874	34.0=31,348
(2)	Spring Plow-Straight Farming-Intensive Rowcrops	30.0=110,580	30.0=152,040	30.0=142,830	30.0=27,630
(3)	Conservation Tillage-66% Coverage-corn/Soybeans	22.4=82,566	22.0=111,496	22.0=104,720	22.4=20,652
(4)	Parallel Terraces	8.0=29,488	8.0=40,544	8.0=38,088	8.0=7,376
(5)	Parallel Terraces/Conservation Tillage	5.2=19,167	5.2=26,353	5.2=24,757	5.2=4,794
(6)	R-R-O-M-Fall Plow-Terraces	2.5=9,215	2.5=12,670	2.5=11,902	2.5=2,305
(7)	R-R-O-M-Terraces/Conservation Tillage	1.9=7,003	1.9=9,629	1.9=9,045	1.9=1,751
CLASS IV (9-14%)		460 acres X	691 acres X	460 acres X	
(1)	Fall Plow-Straight Farming-Intensive Rowcrops	74.6=34,316	74.6=51,548	74.6=34,316	
(2)	Spring Plow-Straight Farming-Intensive Rowcrops	65.5=30,130	65.5=45,260	65.5=30,130	
(3)	Conservation Tillage-66% Coverage-Corn/Soybeans	59.1=27,186	59.1=40,838	59.1=27,186	
(4)	Parallel Terraces	9.0=4,140	9.0=6,219	9.0=4,140	
(5)	Parallel Terraces/Conservation Tillage	5.9=2,714	5.9=4,076	5.9=2,714	
(6)	R-R-O-M-Fall Plow-Terraces	4.9=2,254	4.9=3,385	4.9=2,254	
(7)	R-R-O-M-Terraces/Conservation Tillage	2.2=1,012	2.2=1,520	2.2=1,012	

*Soil Loss Factor-This column represents the average tons of soil loss per acre per year.



CAPABILITY CLASS ANALYSIS OF TERRACING NEEDS
IN THE CLARION-WEBSTER SOIL AREA

Estimated Terrace Needs:

CLASS I 14,208 acres - None

CLASS II 53,760 acres - 672 miles

This is based on one (1) mile of terraces per 80 acres of Class II land. A spacing of 240 feet is anticipated.

CLASS III 14,439 acres - 240 miles

Based on one (1) mile of terraces per 60 acres of Class III land. A spacing of 120 to 180 feet anticipated.

CLASS IV and VI 1,613 acres - 44 miles

Based on one (1) mile per 40 acres, with spacing of 120 feet anticipated.

Total estimated miles of terraces from statistical samples and resulting acres of classes is 956 miles on 84,480 acres of land in the participating townships.

SUMMARY

We, the Soil Commissioners of the Guthrie Soil and Water Conservation District, feel this Inventory and Evaluation is showing in print what is obvious to you after every heavy rainfall.

The graphic chart can tell you at a glance what is happening to our soils and the solutions needed for improvement. The tables go into more detail for you to study, consider, and be concerned.

The group approach of terracing and tiling may be your only solution to successfully solving your erosion problem and your neighbors. In many instances, tile of adequate size is needed to match the acres being terraced and for potentially terraced lands in the watershed.

The graphic chart and the tables show a big plus in favor of conservation or mulch tillage. Erosion is reduced approximately forty percent with this practice. In addition, wind erosion is held to a minimum as compared to fall plowing.

The present amount of terraces constructed in Guthrie County is approximately thirty miles per year. With a need of 956 miles for this study area, it's logical to think that many thousand tons of soil will be lost unless terrace construction is accelerated to a much faster pace.

The improvement of water quality in our streams and lakes can only be accomplished by the abatement of our non-point pollution sources, which has been defined as waste and sediment from agricultural lands.

Total control of soil erosion is an impossible goal from all practical standards. However, we do feel that eighty percent (80%) control is within the realm of a reachable goal as this report has shown.

Since our goal is to reduce soil losses to at least five tons per acre per year, the soil loss tables show that on slopes exceeding six percent (6%), terraces alone will not do the job. Other factors such as conservation tillage or a year of meadow may be necessary to reach the five ton goal.

Since this area is basically cash-grain, it is logical that erosion by water and wind will continue to be the major hazard until controls are applied.

The known controls are conservation tillage and tile outlet terraces. A must for controlling wind erosion is either spring plowing or some type of conservation tillage which leaves crop residue on the surface thru the winter season.

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